PhD PROPOSAL

REGIONAL PRODUCTION NETWORKS, FOREIGN DIRECT INVESTMENTS & TRADE PATTERNS: THE CEFTA 2006 CASE

PhD Student: Vinko Zaninović, University of Economics, Faculty of Ljubljana, Slovenia, assistant at University of Economics, Faculty of Rijeka, Croatia

Abstract

Technological progress that caused fall in trade costs and subsequent economic globalisation created impetus for international production fragmentation and development of international supply chains. From experiences of East Asia countries, it is widely accepted that regional and global economic integration, along with supportive economic policy that promotes trade liberalization, is positively correlated with economic growth. On a micro level, regional cross-country firm trade, creation of regional supply chains and regional production networks has positive effects of both suppy and demand side of economies involved because of positive effects on productivity, competition and technological innovation.

This PhD dissertation examines the trade flows of intermediate & final goods and foreign direct investment flows in countries that signed Central European Free Trade Agreement 2006. Particularly, proposal researches level of regional production fragmentation using country and firm level data from 2001 to 2012. Aim of the dissertation is to investigate effects of CEFTA 2006 on production networks activity. This will be done through four papers – one focusing on underlying theory and three empirical papers.

1. INTRODUCTION & LITERATURE REVIEW

Regionalization through regional trade agreements has accelerated from early 1990s. As of July 2013 there are 379 of them in force (WTO, 2013). New trade agreements go beyond customs and quota removal and include standardization agreements, harmonized competition policies, investment related policies, etc. One of the reasons for this process can be found is increased flows of goods, services, capital, people and information across borders (globalization). Lower transport costs and Information Age made offshoring and outsourcing profitable and eased mobility of technology. Parallel to that, there is an expansion of global and regional value chains (value chain being by the definition sequence of productive activities leading to end use; Sturgeon, 2000) global and regional production networks (the difference being that regional are confined to a multi-country trade bloc whereas the global include linkage between all three main trade/production hubs, namely in North America, Europe and East Asia) that is pulling deeper integration of economic regions into deeper integration levels. One of the reasons for that is that the trade has changed in recent decades – trade focus changed from trade in final goods to trade in intermediate goods. Firms rely on imported inputs that are then used in production of export products (definition of vertical specialization trade, VS).

Rise in VS is empirically researched by Hummels, Rapoport and Yi (1998) and Hummels, Ishii and Yi (2001) with the main focus of their articles being the vertical specialization and changing patterns of world trade. On the important findings of the latter mentioned paper is that VS accounted for 30% of the growth in exports of the countries observed (10 Organisation for Economic Co-operation and Development (OECD) countries and 4 emerging countries that covered approximately 60% of the world trade).

According to the theory of international production fragmentation (Jones & Kierzkowski, 1990), the basis for the process of production networking (PN) can be found in the classical and neoclassical theory of international trade. Classical models (Ricardo) would suggest that existing differences in technology make some countries more productive in the production of different products. Furthermore, the Heckscher-Ohlin trade theory explains trade patterns through relative factor endowments where countries specialize in the production of goods that require more of the relative abundant production factor. If we add a possibility of fragmenting production process of one or more good(s) into at least two separate parts, with the possibility of subcontracting tasks of production to foreign countries, we obtain the theory of production fragmentation and outsourcing/offshoring first discussed by Arndt (1997) and Arndt and Kierzkowski (2001).

If the Viner's theory of economic integration is added into consideration, regionalization through preferential trade agreements (PTA) will also lower trade costs, thus creating further motives for international production fragmentation, i.e. offshoring (Grossman & Rossi-Hansberg, 2006 & 2008). In that sense, offshoring has similar effects to technical advancement in production, given

the fact that the production of particular components is shifted in country with comparative advantages and therefore, the greater quantity of the final product will be produced with the same amount of inputs. Offshoring is also closely connected with foreign direct investments (FDI) if the firm wants to keep the production process to itself. Also, the importance of PTA in increasing production networking is singled out in Hummels, Ishii and Yi (2001) because of its effect of reducing the costs of moving (intermediate) goods across borders. Excellent discussion regarding the effects of PTA on cross-border production sharing and FDI can be found in Arndt (2002).

The third key element, along with aforementioned production fragmentation and regionalization, that marked the modern economic theory, are FDI surges in 1980s, along with the globalization of business (Moosa, 2002). In the context of (vertical) production networks, vertical FDI are of particular interest. Multinational enterprises (MNE) use vertical FDI to spread different parts of the production process in different regions/countries. Reasons for this process can again be found in neoclassical trade theories – firms use differences in production (factor prices) and trade costs. Furthermore, of particular importance for the host country are inward FDI, because of their potential effect on real income through output, rent and spillover effects. Growth of FDI and its connections with the growth of intermediate trade is empirically researched by Bergstrand & Egger (2008) on the sample of 160 countries from 1990 to 2000. Their conclusion is that international outsourcing of intermediates production could explain economically significant amount of the level of FDI relative to final goods trade.

The main aim of this dissertation is to, through the aforementioned theoretical framework and through empirical research, explain effects of Central European Free Trade Agreement 2006 (CEFTA hereinafter) integration on its member states through trade and FDI patterns and creation/upgrading of production networks. The research interest for this topic stems from the fact that, through complementary interactions from both trade and investment enhancing policies (FTA caused), it is possible to obtain the maximum welfare gains for signatories. Therefore, in order to research the existence and development of the aforementioned complementary interaction, the focus of the thesis will be fragmentation of the production process and efficiency-seeking, i.e., vertical FDI, between signatories. Furthermore, exploitation of efficiency advantages at different stages of production process through sequentially linking production processes at several countries will be observed on country and firm level.

Given that these countries have a more or less clear (long-term) perspective of EU membership, understanding production, trade and FDI flows between them is important not only for the economic development of the countries in question but for the regional economic development and success of the regional development policy of the EU as well.

3. RESEARCH TOPIC & QUESTIONS

The (Western) European production networks recorded steady growth from 1995 to 2008 and in the long run it is obvious that the global financial crisis from 2008 didn't cause major disruptions (Los, Timmer & de Vries, 2013). On the other part, production networking in the countries of Central and Eastern Europe (CEE) came into focus for researchers only upon their accession into EU (e.g. Kaminski & Ng, 2005; Martinez-Zarzoso, Voicu & Vidovic, 2011).

At the time, non-EU countries of South-East Europe (CEFTA 2006 countries) remained out of the scope of thorough research. *So, the main topics of my dissertation are production networks in the CEFTA 2006 countries, i.e., the impacts of free trade agreement (FTA) on creation and growth of production networks in those countries. Trade and FDI patterns before and after CEFTA accession will be analyzed and the causal link between FDI and PNs, and FDI and trade flows in the region will be established and explained.* In order to distinguish between intermediate and final goods, country and firm-level data regarding trade in goods used in the dissertation will be disaggregated at product level (according to Harmonized System (HS) at 8 digits). Furthermore, in order to differentiate between horizontal and vertical FDI, a method proposed by Helpman (1984) will be used, i.e., the firm will be regarded as vertically integrated if the foreign affiliate receives a substantial share of input goods from the parent company.

Since the dissertation will be written as a series of papers, the first paper deals with the underlying theory of production fragmentation and the effects of FTA on FDI and trade flows that theoretically have a positive effect on the further development of PNs. The CEFTA case will be dealt with, through the aforementioned theoretic background. *The paper will examine the linkage between the creation of FTA and vertical specialization. It will answer the question of how the trade and FDI patterns change as a cause of economic integration.*

The second paper will be addressing the impact of FTA on vertical specialization patterns in CEFTA case using augmented gravity model. *How and to what extent did FTA impact intra-regional trade in intermediate and final goods? How the FTA did affect trade patterns between CEFTA countries and what are its implications on production networks? That is, did the FTA cause a significant increase in VS?*

The topic of the third paper will be the impact of FTA on FDI flows in CEFTA countries. Panel data with the data ranging from 2000 to 2013 will be used. In order to control for the relationship of FDI and trade flows, bilateral flows of intermediate goods will be included in the model. The goal of this paper will be to explain FDI patterns in CEFTA as a result of integration.

The focus of the fourth paper will be the firm-level analysis of the extensive and intensive trade margins and the effects of decreased trade costs and FDI flows on them. Research will be carried

out for firms located in Croatia from 2000 to 2013. Main goal of the paper will be to account for changes in number of exporting firms, number of good exported and average number of different goods exported per firm as a result of lowered trade costs, in part to CEFTA creation. Also, using data for FDI inflows, broken down according to the National Classification of Economic Activities (NKD), the paper will research effects of FDI on extensive and intensive trade margins.

4. METHODOLOGY

Given the fact the link FTA – trade & FDI patterns – production networks is rarely analyzed together, the first paper will present concise theoretic background for each of the mentioned elements with the goal of combining them to show that in the economies of the 21st century, the success of one country is closely linked with regional economic relations and participation in different economic integrations (which then has consequences on trade & FDI patterns and production fragmentation).

For the second paper, in order to capture the effects of RTA membership of trade flows in intermediate and final goods for the Western Balkan countries (Albania, Bosnia & Herzegovina, Croatia, Kosovo, Macedonia, Montenegro and Serbia) and Moldova, an (log-linearized) augmented gravity model will be used (follows Athukorala and Yamashita, 2006; Matinez-Zarzoso, Voicu, and Vidovic, 2011):

$$X_{ijt} = \alpha_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 GDPc_{it} + \beta_4 GDPc_{jt} + \beta_5 DST_{ij} + \beta_6 LANG_{ij} + \beta_7 BRD_{ij} + \beta_8 LCK_{ij} + \beta_9 WTO_{ij} + \beta_{10} PTA_{ij} + \beta_{10} ROO_{ij} + \varphi_{ijt} \quad (1)$$

The dependent variable (X_{ijt}) represents value of merchandise trade flow in intermediate goods of between country i (exporter, an CEFTA member) to country j (import country) in period t, and the independent variables are GDP (GDP_{it} and GDP_{jt}) and GDP per capita ($GDPc_{it}$ and $GDPc_{jt}$) of trade partners, distance between trade partners (DST_{ij}), a dummy variable which is equal to one if the trade partners have a common language ($LANG_{ij}$), a dummy variable which is equal to one if the trade partners share land border (BRD_{ij}), a dummy variable which is equal to one if particular trade partner is landlocked (LCK_i and LCK_j), a dummy variable which is equal to one if both countries are WTO members, and a dummy variable equal to one if countries are in the same PTA. ROO_{ij} is a rules of origin dummy variable with value 1 if the trade partners are members of Pan-European system of diagonal cumulation. Variable φ_{ijt} captures country and time fixed effects and a stochastic error term.

The model (1) will be estimated also for the dependent variable calculated as imports of country i from country j and with the depended variable being trade flows in final goods in order to observe the impact of FTA on trade structure. Data for the variables mentioned in the model will be taken from Eurostat Comext, UN Comtrade and national statistics offices, with the dataset covering period from 2001 to 2013.

For the third paper, the effects of being in a CEFTA on intraregional and interregional FDI flows using (log-linearized) FDI version of gravity model (based upon and modified from Egger & Pfaffermayr, 2004) will be researched:

$$FDI_{ijt} = \alpha_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 GDPc_{it} + \beta_4 GDPc_{jt} + \beta_5 INTTR_i + \beta_6 INTTR_j + \beta_7 COMP_{ijt} + \beta_8 CEFTA_{ij} + \beta_9 WTO_i + \beta_{10} WTO_j + \mu_{ij} + v_t + u_{ijt} \quad (2)$$

I plan to use this method because the FDI gravity models, like those for trade, have good explicative power of the FDI patterns between countries. Dependent variable FDI_{ijt} represents bilateral FDI flows between particular CEFTA country and other countries with significant FDI flows. Independent variables $INTTR_i$ and $INTTR_j$ present the share of components trade in total trade in respective countries. Variable $COMP_{ij}$ represents trade flows in components between countries i and j. Variables $\mu_{ij} + v_t + u_{ijt}$ represents unobservable country-pair effects, time specific effects and stochastic disturbance term respectively. Exploration for the other variables is same as in for model (1). Data from National banks for FDI flows will be used and data regarding trade in intermediates comes from UN Comtrade, with dataset covering annual data from 2001 to 2013.

The topic of the fourth paper will be the research of the extensive and intensive trade margins on the firm level data for the firms located in Croatia (Croatian Bureau of Statistics dataset). Yi (2003) explained potential, international fragmentation induced, effects on extensive trade margins, although his research was done on the country level. This paper will be focused on heterogeneity at the firm and product level (seminal paper from Melitz, 2003) and the effects of diminishing trade costs and FDI flows effect on extensive (number of firms exporting, number of different exported goods and average number of export goods per firm) and intensive trade margins (total average exports sales). Aforementioned components, that are depended variables in the model, will be regressed on the standard gravity model independent variables discussed in the second paper (distance, GDP, common border, etc.) and on FDI inflows on industry level. Methodology builds on Bernard et al. (2007) and Lawless (2010) and introduces product heterogeneity measured at 8-digit level of HS and effects of FDI inflows on the set of depended variables.

Estimated model will be the following:

$$z_{jkt} = \alpha_0 + \beta_1 gdp_{jt} + \beta_2 DIST_j + \beta_3 PTA_{jt} + \beta_4 ROO_{jt} + \beta_5 fdi_{jkt} + \varphi_{jt} \quad (3)$$

The dependent variable z_{jkt} represents trade flows decomposed into the extensive and intensive trade margins:

$$e_{FLOW\,jkt} = n_{jkt} + \frac{e_{FLOW\,jkt}}{n_{jkt}},$$

Where values are expressed in logs and $e_{FLOW\,jt}$ stands for total export flows to country j, n_{jt} is a number of firms exporting to the destination, $\frac{e_{FLOW\,jt}}{n_{jt}}$ are average exports per firm. Also, in order to capture effect of change of independent variables on number of goods traded and number of different products exported per firm, another composed dependent variable z^1_{jkt} will be regressed on the independent variables, where z^1_{jkt} is:

$$g_{jt} = n_{jkt} + \frac{g_{jt}}{n_{jkt}}$$

g_{jt} is total number of products exported, and $\frac{g_{jt}}{n_{jkt}}$ is average number of traded products per firm. Other variables have identical explanation as in the second and third paper, only the notation is different due to the fact that we are following from one country (firms) perspective with other countries in time (dataset covers period from 2000 to 2013) and the k stands for particular 2-digit NKD classification of particular firm.

5. CONTRIBUTION TO THE FIELD OF KNOWLEDGE

First paper will contribute to existing literature in a way that will bring together the theories of economic integration and production fragmentatin with trade and FDI flows patterns and effect they induce on country/firm level. Moreover, literature review on aforementioned theory will be given from CEFTA countries perspective.

The second, third and fourth paper have empirical contributions. Namely, the second and third paper will use an augmented gravity models that, although the basic gravity models have been used in numerous papers, augmented models are used seldomly and they haven't been used in the case of CEFTA and in connection to regional production networks. The "augmented" parts of the gravity model are well suited for research into the existence of vertical specialization following economic integration and this will be the first research of that kind for CEFTA countries. The fourth paper will use firm-level data in the time span of fourteen years in order to capture changes in extensive and intensive trade margins due to the reduced trade costs and FDI flows. Novelty of the empirical approach is in adding FDI flows and RTA induced effects, in order to account for changes in margins as well as accounting for effects on trade in multiple goods. Moreover, panel data analysis on the firm level for such a long time span is unique.

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