EXPORT INCENTIVES` EFFECTS FOR THIRD COUNTRIES` EXPORT

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Abstract: According to theory, effects of domestic export incentives for foreign exporters can be both negative and positive. Negative effects emerge due to competition in international markets while positive effects transmit via input-output linkages in global value chains (GVCs). Though the relevant theory is rather rich and well established, there is no single study, which would empirically test these effects. This paper represents the first trial to provide empirical evidence on effects of export incentives for foreign countries` exports, separately accounting for possible negative and positive ones. In particular, it examines how recent export incentives implemented in Brazil, India and China (BICs) affected exports of other large emerging markets (I focus on a set of 18 Asian, Latin American and European emerging countries). According to the results, BICs export incentives have had significant negative competition effects as well as positive effects transmitting via GVCs linkages on other emerging markets` exports. In general, negative competition effects crowd in emerging markets with less advanced export structure (resource-based exporters). Geographically, Latin American emerging countries seem to suffer most from increased competition in international export markets due to BICs export incentives. Industrially, largest negative effects have been found in textile sector. Largest positive effects transmitted via input-output GVCs linkages come from Chinese export incentives targeted at inputs. Geographically they crowd more in countries with less advanced export structure and, specifically, in Latin American emerging markets, industrially – in agriculture, food and textile sectors.

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1. INTRODUCTION

The main issue in both policy and academic discussion of export incentives and particularly export subsidies has been whether they have significant negative impacts on foreign (rival) countries. Earlier strategic trade policy literature (Spencer and Brander 1983; Brander and Spenser 1985; To 1994) conclude that in the world of imperfect competition and without trade in intermediates, export subsidies can help domestic firms to capture market shares of foreign firms in international markets thereby pointing to negative effects of domestic export incentives on foreign export. In this study, I refer to such effects as to *negative competition effects.*

However, as Hoekman (2015) notes, once the shift towards global value chains (GVCs) production is considered and linkages within and across value chains must be taken into account, determining the net effects of government export policies becomes more complicated. In particular, domestic sectoral or firm-specific government policies in GVCs world can benefit GVC as a whole including foreign firms/plants, their workers and local communities (Hoekman 2015). Several theoretical papers (Spencer and Jones 1991; Bernhofen 1997; Ishikawa and Spencer 1998; Sheldon, Pick, and McCorriston 2001; Lee and Wong 2005) attempted to shed light on these issues by studying external effects of export incentives in the presence of trade in intermediates/inputs (main attribute of GVCs). In general, these studies conclude that under certain theoretical assumptions and in the presence of trade in intermediates/inputs, domestic export incentives, particularly export subsidies, can lead to profit/rent-shifting effects to foreign producers (exporters) within common value chains. Altogether, there are two main types of such effects. The first ones come from export incentives targeted at processed goods to oligopolistic/monopolistic foreign producers of inputs, imported by source country of incentives to be used in production of subsidized processed goods (Bernhofen 1997; Ishikawa and Spencer 1998). The second ones come from export incentives targeted at inputs to foreign producers (exporters) of processed goods who import and use subsidized inputs in production (Spencer and Jones 1991; Sheldon, Pick, and McCorriston 2001; Lee and Wong 2005). In this study, I test the presence of the second type of effects (which are coming from export incentives targeted at inputs) and refer to such effects as to *positive "GVCs input-output linkages" effects*.

To the best of my knowledge, this is the first study, which provides empirical test of the presence of the outlined effects (both negative and positive). In my empirical analysis I focus on large emerging countries (the set of emerging countries include 18 European, Asian and Latin American countries) in period of 2009-2015. In particular, I study effects of export incentives implemented in Brazil, India and China (BIC) in recent years for exports of other large emerging economies. BIC countries as source of export incentives are very suitable for this project, particularly, due to their rather aggressive export promotion policies in recent years, which, according to classical view, should harm significantly commercial interests of other countries with which BICs compete in international markets. In particular, Evenett (2015) reports that since the Global Crisis began three of the BRICS (Brazil, India, and China - BICs) have implemented numerous incentives to inflate exports. These incentives harm the interests of trading partners that compete in the same markets abroad.

In the empirical analysis, I develop a framework to estimate how export incentives implemented in each BIC country affect export of selected emerging countries. In particular, in gravity-type equations for export at six-digit industry level (HS6 2007) of a panel of 18 emerging countries in period 2009-2015, I control for export incentives implemented in Brazil, India and China at four-digit industry level (HS4 2007; as available) and weight them by indices which reflect similarity of exports` geographical distribution between respective BIC country and respective emerging country in respective six-digit industry (HS6 2007). By this, I am able to test for the presence of *negative competition effects* coming from BICs export incentives to other emerging markets. I further construct and include measures to control for *positive "GVCs linkages" effects* coming from BICs export incentives targeted at inputs, which are imported by other emerging countries and used in their exportable production. The respective parameters are constructed at six-digit industry level (HS6 2007). Data on export incentives comes from Global Trade Alert (GTA) database of Centre for Economic Policy Research (CEPR). Data on export/import comes from UN COMTRADE.

According to empirical results, there have been both significant *negative competition* and *positive "GVCs linkages" effects* of BICs export incentives for export of other large emerging economies. In particular, I find that largest negative effects come from Brazilian export incentives. On the one hand, this result points to the higher effectiveness of Brazilian export incentives compared to Indian and Chinese ones. On the other

hand, Brazil might be just more important competitor for other emerging countries while China and India emerge as important competitors for each other and developed countries.

I further find that largest "recipients" of *negative competition effects* of BICs export incentives are emerging countries with less advances export structure (resource-based exporters), Latin American emerging countries, in particular. These results seem plausible as in average export activities of Latin American emerging countries are less developed and diversified (at least in comparison with Asian emerging markets) which makes their export more vulnerable to external factors such as aggressive foreign export promotion policies. European emerging markets, on the other hand, due to their specific geographical position might compete relatively more with European developed countries than with BICs.

Industrially, largest negative effects of Brazilian and Indian export incentives were found in textile sector and smallest – in machine export. These results also seem plausible, as one would expect tougher competition of emerging markets in textile rather than in machinery sector. Negative effects of Chinese export incentives do not seem to have any significant industrial patterns.

Evidence on *positive "GVCs linkages" effects* is a bit smaller in general. However, we find rather strong evidence that Chinese export incentives targeted at inputs positively affect export of other emerging countries via GVCs linkages. Literally, it means that usage by emerging countries of imported subsidized Chinese inputs in exportable production positively affect their export of respective goods. Largest positive effects from Chinese export incentives targeted at inputs go to emerging countries with less advanced export structure, in particular, to Latin American emerging markets. Industrially, these effects mainly crowd in agriculture, food and textile sectors.

This paper is linked with two broad literatures. First, this paper contributes to the literature on third-country effects of trade policies (Winters and Chang 2000; Chang and Winters 2002; Bown and Crowley 2007; Bown and Crowley 2006; Conconi et al. 2016), and particularly to the strand of literature that theoretically examine effects of domestic export incentives for foreign producers/exporters (Spencer and Brander 1983; Brander and Spenser 1985; To 1994; Bernhofen 1997; Ishikawa and Spencer 1998; Sheldon, Pick, and McCorriston 2001; Lee and Wong 2005). Despite the prominence of this theory, to my knowledge there is no

single study, which would empirically examine these effects. In this paper, I take a step toward bridging this gap between theory and evidence.

Second, this study relates to recent work motivated by the emergence of global value chains (Johnson and Noguera, 2012; Koopman et al., 2014; Kee and Tang 2016; Antras et al., 2012; Antras and Chor, 2013; Alfaro et al., 2015 and 2016 among others) and in particular to recently emerging literature on trade policies in the age of global value chains. Baldwin and Venables (2013) developed a model in which the interaction of forward and backward linkages determines the range of goods and of parts that are produced in a developing economy. Using a simple formalisation of the range and sophistication of parts used in different goods, the paper investigates the effects of trade and industrial policy. Gawande, Hoekman and Cui (2015), using trade and protection data for seven large emerging market countries that have a history of active use of trade policy, empirically examine the influence of various factors on trade policy responses to the 2008 crisis. Participation in global value chains is found to be a powerful economic factor determining trade policy responses. Blanchard, Bown and Johnson (2016) theoretically predict and empirically prove that, first, discretionary final goods tariffs will be decreasing in the domestic content of foreign-produced final goods and, second, provided foreign political interests are not too strong, final goods tariffs will also be decreasing in the foreign content of domestically-produced final goods. Conconi et al. (2016), focusing on the North American Free Trade Agreement (NAFTA), find that rules of origin of NAFTA on final goods led to a sizeable reduction in the growth rate of Mexico`s imports of intermediate goods from third countries.

The paper is organized as follows. Section 2 reviews the related theoretical literature. Sections 3 discusses recent data on BICs export incentives. Section 4 briefly discusses export patterns of emerging markets. Section 5 describes empirical strategy and data. Section 6 and 7 present and discuss empirical results. Finally, section 8 offers conclusions.

2. THEORETICAL FRAMEWORK

Though the perfectly competitive model of international trade says that, in general, export subsidies reduce home country welfare, in the world of imperfect competition by subsidizing/promoting export countries might

increase their domestic welfare if they win in competition for profitable international markets. In their seminal paper Spencer and Brander (1983) has shown that in imperfectly competitive international markets, a government, which has the objective of maximizing domestic welfare, may have an incentive to subsidize research and development activities of domestic firms in industries in which they compete with foreign firms for international markets. In particular, they conclude that in the case of subsidy domestic welfare is improved by the capture of a greater share of the output of rent-earning industries, although the subsidy-ridden non-cooperative international equilibrium is jointly suboptimal. In a companion paper Brander and Spencer (1985) further present the analysis based on imperfect competition (in particular, they incorporate Cournot duopoly into a one-period "third market" model) to explain why export subsidies might be attractive policies from a domestic point of view. They found that governments` optimal policy is to subsidize exports because export subsidy improves the relative position of the domestic firm in non-cooperative rivalries with other firms, and allow it to expand its market share. To (1994) goes forward and examines export policy using a two-period model of oligopolistic competition with switching costs. He concludes: "When governments and firms are patient, consumers are impatient, and switching costs are significant, exporting countries will subsidize exports in the first period. A subsidy helps capture market share which is valuable to the government in terms of both second-period profits and second-period tax revenues" (To 1994, p. 100). All these studies come to a general conclusion that in markets with imperfect competition export incentives (subsidies, in particular) can benefit implemented countries and harm affected (rival) foreign countries if they help subsidized domestic firms to capture market shares of foreign firms in international markets. In other words domestic export promotion measures enhance domestic export (lead to the increase of domestic export shares in the world markets in affected industries) but negatively affect export of foreign rivals (i.e. the respective export shares of affected foreign countries fall). In the rest of the paper, I refer to the latter effect (i.e. negative effect of export incentive targeted at domestic good for foreign export of the same good) as to *negative competition effect*.

In strategic trade policy models outlined above, only a final product is considered and only primary factors are used in the production process. However, in the real world most industries use in production not only primary factors but also intermediate inputs. Furthermore, the rising international trade in intermediate

inputs reflects the increasing importance of GVCs when production processes span multiple countries, with each country specializing in particular stages of a good's production sequence (Costinot, Vogel, and Wang 2013). These facts have been recognized in academic literature and a number of papers have emerged analyzing various issues of interaction between trade in intermediate inputs and trade policies. In this study, I focus on the literature, which examines positive effects of domestic export incentives on foreign countries` export, which transmit via GVCs` linkages.

The seminal paper for the case of third-country effects of export incentives aiming at domestic final-good producers in the presence of intermediate trade is Ishikawa and Spencer (1998). Ishikawa and Spencer (1998), under assumption of Cournot competition, conclude that in vertically related industry an export subsidy aimed at shifting rents from foreign to domestic final-good producers may also shift rents to oligopolistic foreign suppliers of intermediate inputs. Bernhofen (1997), assuming that intermediate good is supplied by a foreign monopolist, similarly finds that export subsidy on domestic final-good producer can cause a vertical rent-shifting from domestic downstream producer to foreign upstream supplier.

In their influential paper Spencer and Jones (1991) study the market structure where, in the home country A, there is a vertically integrated firm controlling exports of both an intermediate and a final good. This firm competes in a foreign country B with a firm that produces the final good and has the option of either importing the intermediate good or producing it at higher cost. In the case of trade in intermediate and final goods, if in home country A profit margins are higher for trade in the former, Spencer and Jones show that the optimal policy of country A government is a tax on exports of the final good in order to shift toward trade in the intermediate good. Such a policy results in that low-cost vertically integrated manufacturer in country A exports an intermediate product, lowering the costs of a foreign rival producer of final goods in country B thereby stimulating country B export of respective final goods. For the empirical context of this study, these conclusions imply that when a government establishes export incentives targeting at domestic intermediate-good producers, it might benefit foreign producers who import these intermediate inputs for their exportable production of final/higher-tier intermediate goods.

Similarly, Lee and Wong (2005) examine the use of export subsidy to encourage domestic production of an intermediate input or a final product in a model with international rivalry between firms in two countries. Lee and Wong paper is a simple extension of a well-known international duopoly model considered in the literature to study the use of export subsidies. They consider two countries, labeled home and foreign, and two industries in each country: one for a final good for consumption, and another for an intermediate input, which is used exclusively in the production of the final good. Trade between the two countries in the intermediate product is allowed, while outputs of the final good are sold in the rest of the world. According to their model, under certain theoretical assumptions, domestic subsidy for intermediate-input producer leads to the increase of output and profit of foreign producer of final good, which uses respective intermediate input in her production.

Sheldon, Pick, and McCorriston (2001) examine the interaction between export subsidies and profit-shifting in a vertical production system, where each stage of production downstream from agriculture may be characterized by imperfect competition. Their focus is on comparing the profit-shifting effect for the case where an export subsidy is targeted either at a foreign final processed good (i.e. foreign export subsidy for final-good producers) or at domestic unprocessed agricultural commodity (i.e. domestic export subsidy for unprocessed agricultural commodity producers), where the latter enters the production process for an intermediate good subsequently used in production of the final processed good. According to their model, domestic export subsidy to the unprocessed agricultural commodity may have greater profit-shifting effects in the final goods` market than a downstream foreign export subsidy. In addition, both types of subsidy result in profits being shifted from the home to the foreign upstream processing firm.

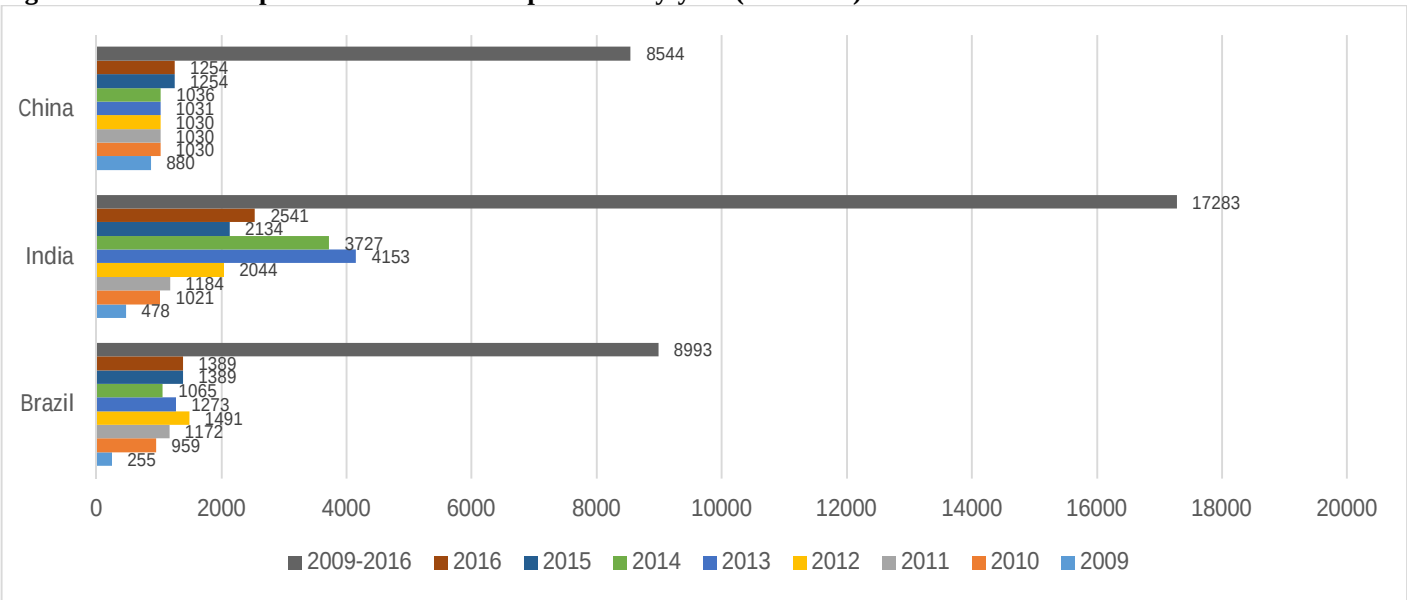
In this paper, I empirically test for the presence of *negative competition effects* of BICs export incentives and *positive "GVCs linkages" effects* coming from BICs export incentives targeted at input in recent years (2009-2015) for export of a selection of emerging markets.

3. EXPORT INCENTIVES IN BRAZIL, INDIA AND CHINA

As was already noted in introduction, Brazil, India and China are very suitable for this project as source countries of export incentives due to their rather aggressive export promotion policies in recent years. In particular, in a recent Global Trade Alert (GTA) report of the Centre for Economic Policy Research (CEPR) authored by Evenett (2015), it has been shown that since the Global Crisis began three of the BRICS - Brazil, India, and China (BIC) - have introduced a large number of additional incentives to inflate exports (i.e. export incentives). In this section, I briefly overview data on recent BICs` export incentives according to GTA database. This database includes trade measures implemented from 2006 to present but does not necessarily contain all implemented measures. First, I report statistics on cumulative number of export incentives[1] by industry (HS4 2007 codes as reported in GTA database) and year of being in force. In particular, for each BIC country I sum up number of export incentives, which are in force by affected industry in a certain year. E.g. if in a country X in a year t two export incentives have been in force and the first one affects 10 HS four-digit industries while the second one – 5 industries, our indicator of export incentives in a year t for a country X equals to 15. In this way we are able to count not just for the number of implemented export incentives but also for their industrial coverage (some incentives concern only one HS four-digit industry, some – hundreds) and duration (some measures last only few months, some – five and even more years). If export incentive lasts only several months, i.e. less than one year, we count for it as 1/12*x where x is duration of the export incentive in months. E.g. for the above example if in a country X in a year t the first export incentive which affects 10 HS four-digit industries has been in force for six months, our indicator of export incentives in a year t for a country X equals to 10 (5 + 5 instead of 10 + 5 in original example). Results of the computations for BIC countries are reported on Figure 1.

[1] In this study, we consider only "Red" measures as marked in GTA database, i.e. those, which are implemented and almost certainly discriminate against foreign commercial interests.

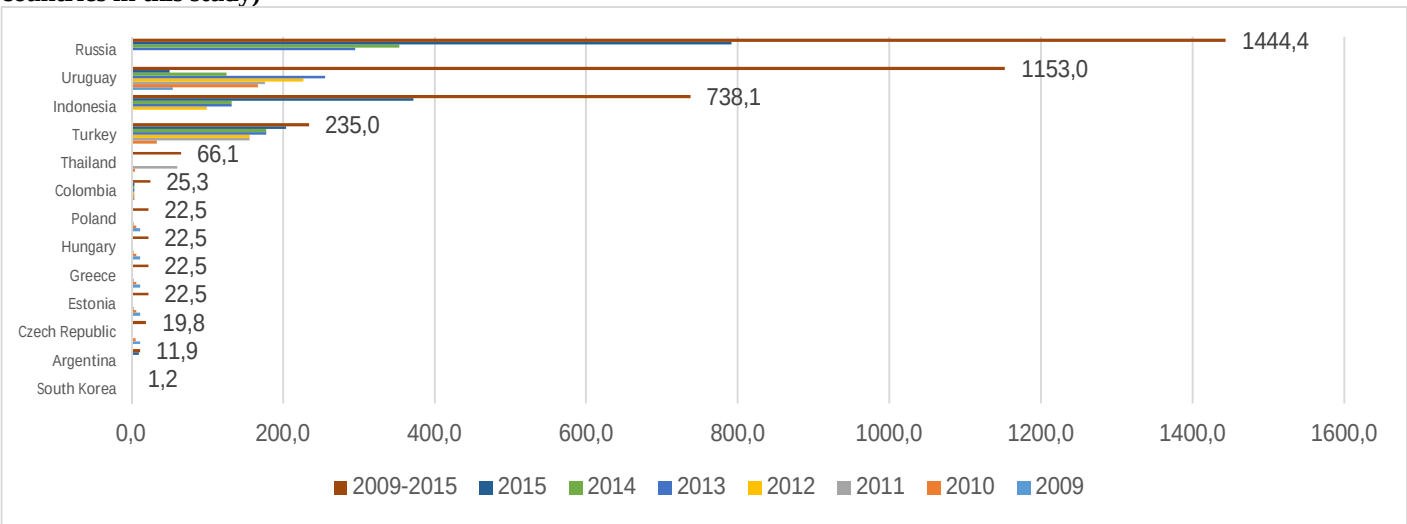
Figure 1 Number of export incentives in force per industry-year (HS4 2007) in BIC countries



Source: Author`s calculations based on GTA data.

As we can see India is an obvious leader here. During the period of 2009-2016 Indian cumulative number of export incentives per industry-year was about 2 times higher than that of Brazil and China. On Figure 2, for comparison, I report the same statistics for other emerging markets used in this study as affected countries (see Appendix 1).

Figure 2 Number of export incentives in force per industry-year (HS4 2007) in selected emerging countries (used as affected countries in this study)



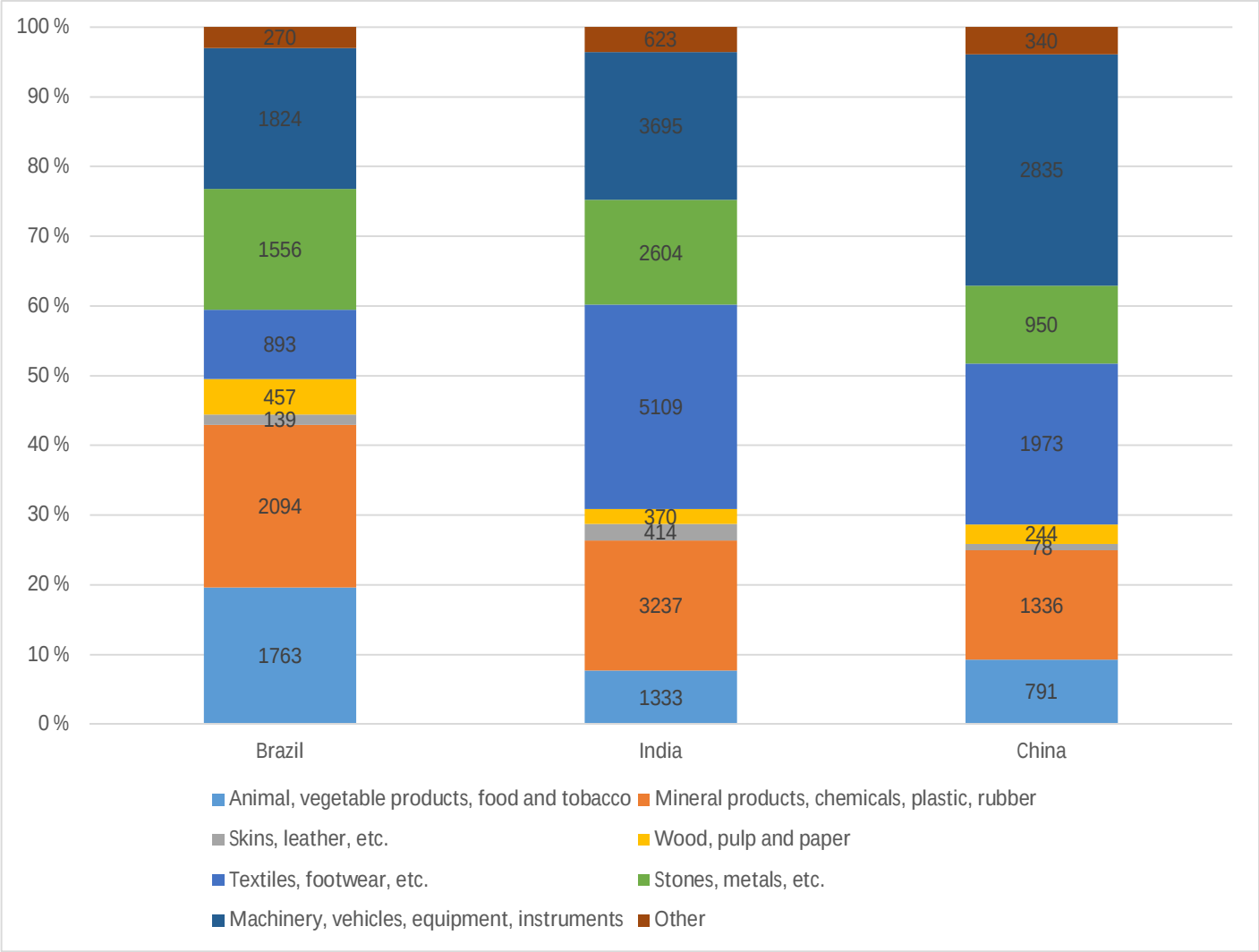
Note: Chile, Malaysia, Mexico, Peru and Vietnam do not have any export incentives ("Red"; see footnote 1) registered in GTA database.

Source: Author`s calculations based on GTA data.

As we can see in other emerging countries, export promotion policies have been much less important in recent years compared to BICs. This indicates that BICs export incentives should have significant effects for export of other emerging markets, as there is no evidence that they have responded adequately.

I next report industrial structure of export incentives implemented in BICs per industry-year as cumulative for the period of 2009-2016 on Figure 3.

Figure 3 Industrial structure of BICs export incentives per industry-year as cumulative in 2009-2016



Note: Based on HS chapter classification: Animal, vegetable products, food and tobacco (chapters 1-24); Mineral products, chemicals, plastic, rubber (chapters 25-40); Skins, leather, etc. (chapters 41-43); Wood, pulp and paper (chapters 44-49); Textiles, footwear, etc. (chapters 50-67); Stones, metals, etc. (chapters 68-83); Machinery, vehicles, equipment, instruments (chapters 84-92); Other (chapters 92-99).

Source: Author`s calculations based on GTA data.

From Figure 3 we can see that BIC countries implemented significant numbers of export incentives in machinery, vehicles, equipment, instruments` sector (for China the share is 33%; for Brazil and India – about

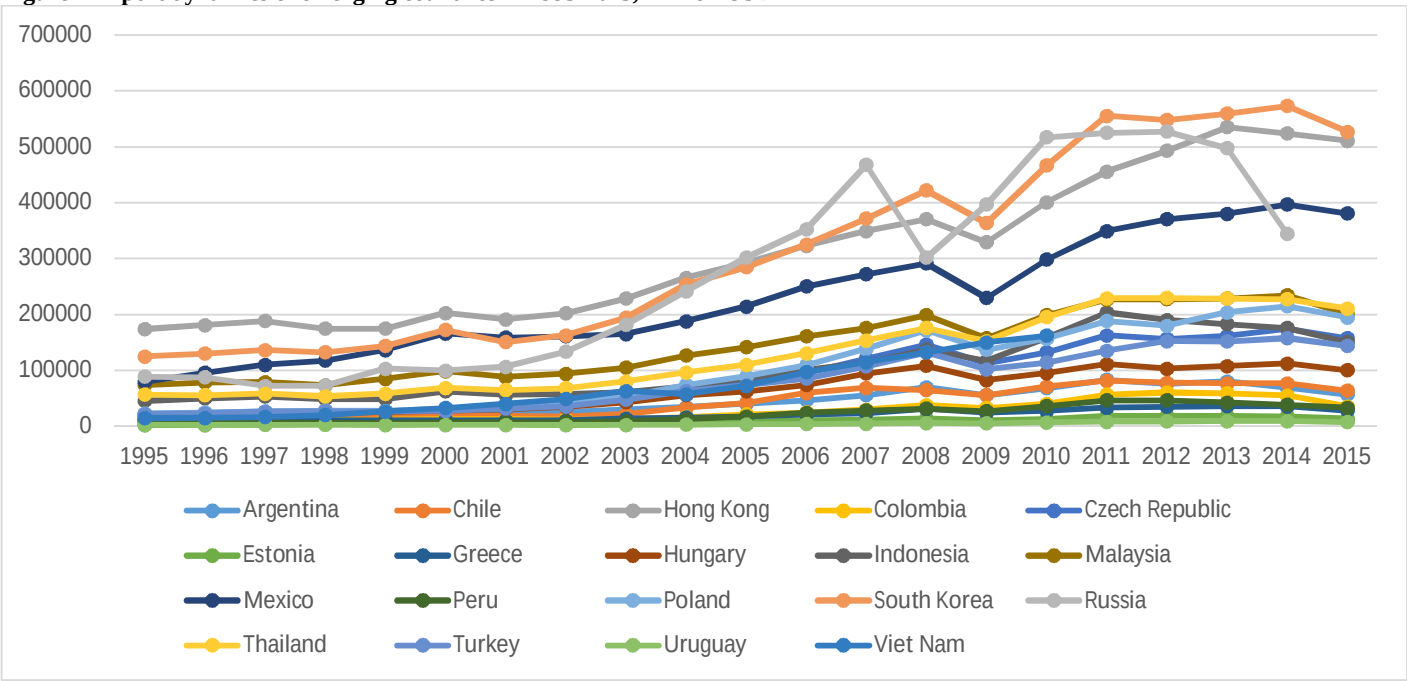
20%). India and China implemented many export incentives in “Textile, footwear, etc.” sector – around 30% and 23%, respectively. Brazil implemented significant numbers of export incentives in agricultural and food industries – about 20% in total numbers of export incentives, respectively. BICs rather intensively stimulate export in “Mineral products, chemicals, plastic and rubber sector” – over 20% of all export incentives in Brazil, about 20% in India and about 15% in China.

After quantitative analysis of BICs export incentives, we briefly turn to the qualitative side of the problem. According to Evenett (2015) and our assessments India stands out for the number of measures taken to boost exports through subsidized trade finance. Many of BICs export incentives involve tax refunds or reductions for firms engaged in exporting. China mostly implements Value Added Tax (VAT) rebates and reductions: 17 out of 27 Chinese export incentives reported in GTA database concern VAT.

4. BASIC EXPORT PATTERNS OF AFFECTED EMERGING COUNTRIES

On Figure 4 I report export dynamic in recent 20 years of the considered 18 emerging countries.

Figure 4 Export dynamics of emerging countries in 1995-2015, Million USD

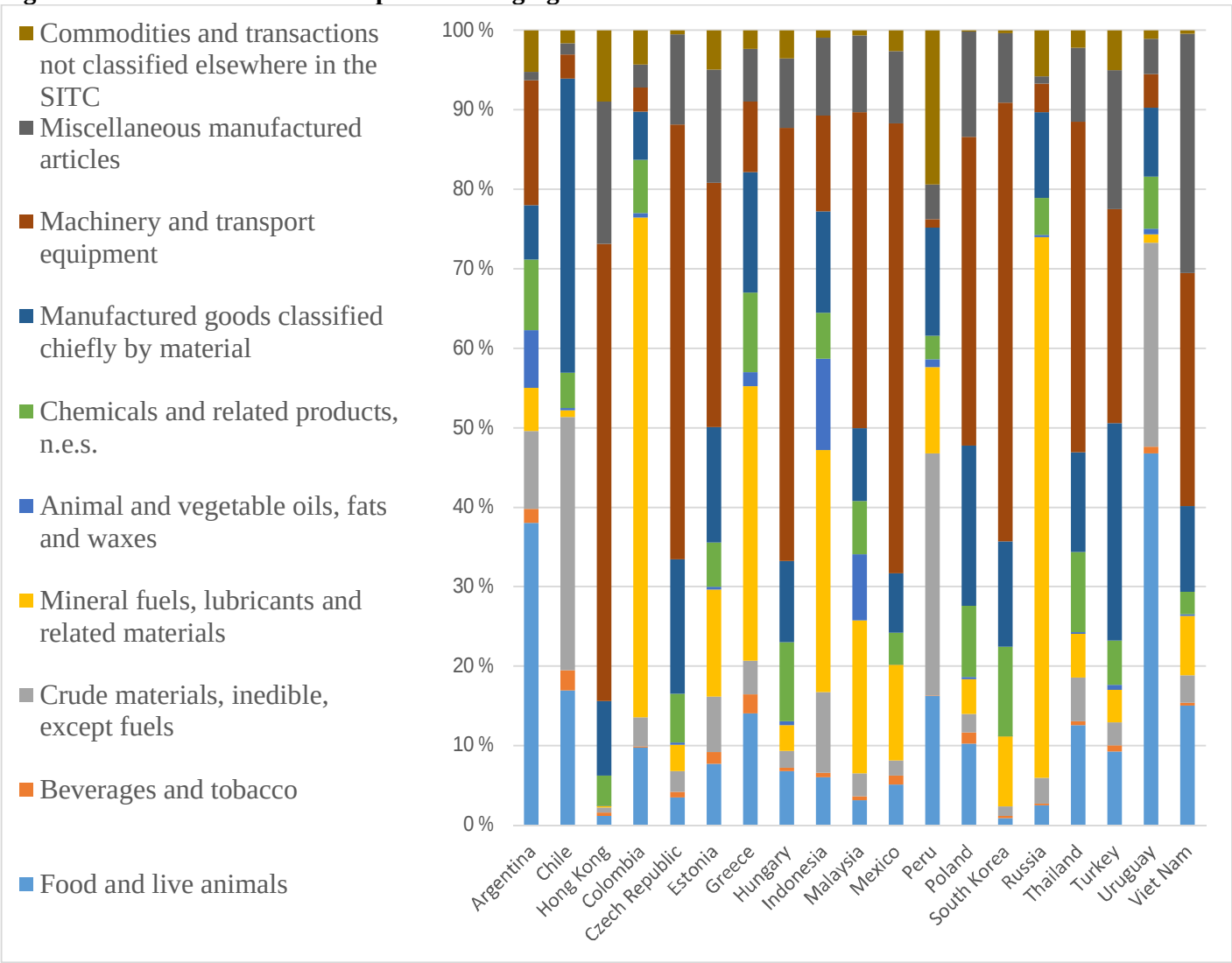


Source: UN COMTRADE

As we can see, though export levels differ between the countries, export time dynamics is rather similar: upward trend until 2007/2008, drop in 2008/2009, some increase until 2011 and then slight downward trend.

On Figure 5 I report industrial structure of export of emerging countries considered in the study in 2009-2015 as cumulative.

Figure 5 Industrial structure of export in emerging countries in 2010-2015



Source: UN COMTRADE

According to Figure 5 all countries can be broadly divided into two groups. First group consists of emerging markets which largly export manufacturing goods: Hong Kong, Czech Republic, Estonia, Hungary, Malaysia, Mexico, Poland, South Korea, Thailand, Turkey and Vietnam. Second group consists of emerging markets which largely export natural resources and related goods (mineral fuels, lubricants and related materials or crude materials, inedible, except fuels) and/or food and agricultural goods: Argentina, Chile, Colombia, Greece, Indonesia, Peru, Russia and Uruguay. It can be suggested that emerging countreis with developed exportable manufacturing sector will tend to get more positive ”GVCs

linkages“ effects from BICs export incentives as this sector should largely depend on intermediate import at least from China and India, which also experienced sharp increase of manufacturing export (which is largely consists of intermediate goods) in recent decades.

5. ESTIMATION STRATEGY AND DATA

Empirical test of the impact of foreign export policy on export must control for other determinants of trade. We adopt a gravity approach to our data and augment it to include foreign export policy measures. Specifically, our baseline model looks as follows:

$$LnEX_{itc} = a_0 + a_1 LnEX_{i,t-1,c} + a_2 LnGDP_{tc} + a_3 ER_{tc} + a_4 NE(BR\_EI)_{it} + a_5 NE(IN\_EI)_{it} +$$
$$+ a_6 NE(CH\_EI)_{it} + a_7 PE(BR\_EI)_{it} + a_8 PE(IN\_EI)_{it} + a_9 PE(CH\_EI)_{it} + \sum_t d_t YD + \sum_{ic} b_{ic}(C' I)D + e_{it}$$

(1),

where $LnEX_{itc}$ / $LnEX_{i,t-1,c}$ is natural logarithm of country c (1,…,18) export in USD in industry *i* (HS6 2007) in a year t / t-1 (2008,…, 2015). Countries c are emerging countries listed in Appendix 1. Data comes from UN COMTRADE. $LnGDP_{tc}$ is natural logarithm of country c GDP in USD in year t (2009,…, 2015). Data comes from World Bank. ER_{tc} is exchange rate index of country c in year t (2009, …, 2015; index in 2008 equals to 100; an increase in the index indicates appreciation of the home currency against USD). Data comes from World Bank. We expect that $LnEX_{i,t-1,c}$ and $LnGDP_{tc}$ relate positively to the dependent variable as basic trade theory predict. Exchange rate should be negatively related to export according to the theory (appreciation of the home currency is expected to deter export).

$NE(BR\_EI)_{it}$, $NE(IN\_EI)_{it}$ and $NE(CH\_EI)_{it}$ were built in the way to reflect negative competition effects coming from export incentives implemented in Brazil, India and China, respectively, for export of selected emerging countries. In particular, I utilize the following formula to construct these variables:

$$NE(Y\_EI)_{it} = Y\_EI_{it} \text{´ } GEO\_ESI_{(c\_Y)i} \quad (2),$$

where Y_EI_{it} is the number of export incentives in industry i (HS4 2007) which are in force in year t (2009,…, 2015) in country Y (Brazil (BR), India (IN), China (CH)). The data comes from Global Trade Alert database. The larger the Y_EI_{it} , the larger negative competition effect is expected for export of country c in industry i in year t. $GEO\_ESI_{(c\_Y)i}$ is export similarity index (ESI) of geographical distribution of exports in industry i (HS6 2002; converted to HS6 2007 after computation) between countries Y and c in 2004-2008 (cumulative). Export similarity index was developed by Finger and Kreinin (1979) and was initially intended to measure product/industrial similarity between exports of two countries to a third country. I transform this index to measure geographical similarity between exports of two countries of the same product/industry in the following way:

$$GEO\_ESI_{(c\_Y,i)} = \left[\sum_b Min\left(\frac{X^b_{Yi}}{X_{Yiw}}, \frac{X^b_{ci}}{X_{ciw}}\right)\right] * 100 \quad (3),$$

where:

X^b_{Yi} is the amount of export of industry i (HS6 2002) from country Y to country b;

X_{Yiw} is the amount of export of industry i (HS6 2002) from country Y to world;

X^b_{ci} is the amount of export of industry i (HS6 2002) from country c to country b;

X_{ciw} is the amount of export of industry i (HS6 2002) from country c to world.

As original index, this index ranges from 0 to 1 where 0 reflects no similarity and 1 – full similarity. Hence, the larger the $GEO\_ESI_{(c\_Y)i}$, the stronger the similarity in geographical distribution of exports in industry i between countries c and Y and, hence, the larger negative competition effect is expected for export of country c in industry i from export incentives implemented in country Y in industry i. In Table 1 I report descriptive

statistics of $GEO\_ESI_{(c\_Y)i}$ between BICs and affected emerging markets. Data used for their computation comes from UN COMTRADE.

Table 1 GEO_ESIs between BICs and affected emerging markets

	Brazil					India					China				
Country pair	N.obs.	Mean	Std. Dev.	Min	Max	N.obs.	Mean	Std. Dev.	Min	Max	N.obs.	Mean	Std. Dev.	Min	Max
Argentina	4469	0,17	0,16	0	0,99	458	0,05	0,08	0	0,98	4563	0,06	0,09	0	0,90
Chile	4183	0,15	0,17	0	1,00	4265	0,04	0,08	0	0,96	4252	0,05	0,09	0	1,00
Colombia	4221	0,10	0,13	0	1,00	4298	0,03	0,06	0	0,85	4271	0,04	0,06	0	0,78
CzechR	4699	0,06	0,10	0	1,00	4883	0,10	0,11	0	0,91	4861	0,10	0,11	0	0,81
Estonia	4203	0,02	0,06	0	0,97	4306	0,04	0,07	0	0,90	4297	0,05	0,08	0	0,97
Greece	4497	0,04	0,09	0	0,96	464	0,07	0,10	0	1,00	4618	0,07	0,09	0	0,93
Hungary	4262	0,05	0,09	0	1,00	4344	0,08	0,11	0	0,85	434	0,08	0,10	0	1,00
Indonesia	4546	0,06	0,10	0	1,00	4704	0,14	0,15	0	0,96	4675	0,18	0,16	0	1,00
Korea	4611	0,08	0,12	0	1,00	4784	0,14	0,14	0	0,96	4764	0,24	0,18	0	1,00
Malaysia	4633	0,06	0,10	0	1,00	4789	0,14	0,14	0	0,99	4754	0,19	0,16	0	1,00
Mexico	4542	0,12	0,14	0	1,00	4657	0,08	0,11	0	0,88	4636	0,09	0,12	0	0,99
Peru	4053	0,12	0,14	0	1,00	4118	0,05	0,09	0	0,75	4103	0,05	0,09	0	0,99
Poland	4702	0,06	0,11	0	0,98	4878	0,10	0,12	0	1,00	4854	0,11	0,11	0	0,94
Russia	4534	0,04	0,09	0	0,99	467	0,06	0,09	0	0,83	4668	0,08	0,10	0	1,00
Thailand	4649	0,07	0,12	0	1,00	4824	0,16	0,15	0	0,97	4791	0,23	0,18	0	1,00
Turkey	4624	0,06	0,11	0	0,96	4776	0,13	0,14	0	0,89	4752	0,13	0,12	0	1,00
Uruguay	2669	0,17	0,19	0	1,00	2699	0,04	0,08	0	1,00	2699	0,04	0,08	0	0,94
Vietnam	4104	0,06	0,11	0	1,00	4219	0,11	0,14	0	1,00	4196	0,19	0,18	0	1,00
Average		0,08					0,09					0,11			

As we can see, highest similarity indices appear for countries located in the same region. In particular, Brazil has highest similarity indices with Argentina, Uruguay, Chile, Mexico, Peru and Colombia; India – with Thailand, Indonesia, South Korea and Malaysia; China - with South Korea, Thailand, Vietnam, Malaysia and Indonesia. This is very plausible because geographical distribution of export largely depends on geographical position of the country, i.e. it tends to export to neighboring countries, first.

$PE(BR\_EI)_{it}$, $PE(IN\_EI)_{it}$ and $PE(CH\_EI)_{it}$ were built in the way to reflect positive effects transmitted via GVCs linkages from export incentives implemented in Brazil, India and China, respectively, for exports of selected emerging countries. In particular, these measures reflect positive effects coming from export incentives targeted at intermediate goods/inputs and implemented in country Y to countries c exports of goods, in production of which imported subsidized intermediates/inputs from country Y are used. The respective variables are computed as follows:

$$PE\,(Y\_EI)_{it} = \frac{\sum_{j_n \in i} InEI_{j_n \in i,tY} \times \frac{\mathrm{Im}_{j_n,t-1,fromYto\_c}}{\mathrm{Im}_{j_n,t-1,fromYto\_World}} \times DR_i^{j_n \in i}}{\sum_{j_n \in i} InEI_{j_n \in i,tY} \times DR_i^{j_n \in i}} \quad (4),$$

where $PE(Y\_EI)_{it}$ represents positive effects coming from country Y export incentives targeted at inputs in industries j_n (HS4 2007) to country c export in industries i (HS6 2007), which use subsidized imported inputs in production. $InEI_{j_n \in i,t,Y}$ is number of export incentives implemented in country Y in input industry j_n (HS4 2007), in force in year t. BEC (Classification by Broad Economic Categories) and its correspondence with HS6 2007 have been used to separate input industries. In particular, HS4 2007 industry is considered as input industry if it contains at least one HS6 2007 industry, which is classified by BEC as intermediate. $\frac{\mathrm{Im}_{j_n,t-1,fromYto\_c}}{\mathrm{Im}_{j_n,t-1,fromYto\_World}}$ is ratio of industry j_n (HS6 2007) import of country c from country Y to total industry j_n (HS6 2007) import of country c for the period of 2004-2008 (cumulative). This term reflects the potential usage of country Y`s inputs of industry j_n in production in country c. $DR_i^{j_n \in i}$ is direct requirement of input from industry j_n (HS6 2007) in production of one unit in industry i (HS6 2007) taken from BEA Commodity-to-Industry Direct Requirement table for the year 2007 (the table was converted from NAIC 2007 to HS6 2007 using Conconi et al. (2016) approach). This term reflects the potential usage of industry j_n input in industry i production. The denominator in the ratio (4) reflects potential global negative competition effects of export incentives implemented in input industries j_n in country Y for world export in industries i, which use them in production. In particular, while we expect that if country c uses intensively in its production in industry i inputs from subsidized industry j_n of country Y, it gets positive effects for its production/export in industry i from respective export incentives, there should be also negative effects coming from competition with other countries, which also use subsidized inputs j_n in exportable industries i.

6. EMPIRICAL RESULTS

Empirical results of equation (1) are reported in Table 2. For estimations, I use panel data model with "country by industry" fixed effects. Descriptive statistics and correlation matrix of the variables are reported in Appendix 2. There is no visible multicollinearity problem in our data. The highest correlation coefficient is between $LnGDP_{tc}$ and ER_{tc}, which equals to 0.43.

Table 2 Baseline results

	Model 1	Model 2	Model 3
Constant	7.789 (0.791)***	7,382 (0.827)***	6,501 (0.882)***
$LnEX_{i,t-1,c}$	0.134 (0.001)***	0,138 (0.001)***	0,137 (0.002)***
$LnGDP_{tc}$	0.045 (0.03) /pv=0.131/	0,104 (0.031)***	0,103 (0.033)***
ER_{tc}	-0.002 (0.0002)***	-0,003 (0.0001)***	-0,003 (0.0002)***
$NE(BR\_EI)_{it}$		-0,291 (0.045)***	-0,287 (0.048)***
$NE(IN\_EI)_{it}$		-0,017 (0.014)	-0,021 (0.015)
$NE(CH\_EI)_{it}$		-0,144 (0.092)	-0,175 (0.097)*
$PE(BR\_EI)_{it}$			-1,25 (0.995)
$PE(IN\_EI)_{it}$			0,63 (0.445)
$PE(CH\_EI)_{it}$			7,341 (1.062)***
N.obs.	621 273	529 276	469 785
R-sq.	0.75	0.65	0.38

Note: Time/year dummies are included in all models; "country by industry" fixed effects.

We can see that there is convincing evidence that Brazilian export incentives negatively affect export of other emerging markets via competition. There is also marginal evidence of negative competition effects of Chinese export incentives for other emerging countries` export.

As for positive "GVCs linkages" effects, they are not statistically significant for Brazilian and Indian export incentives. For China, the respective coefficient is positive and highly statistically significant. Literally, this means that when China implements export incentives for inputs which are intensively used in exportable production in other emerging markets, positive effects spill over to their export.

To get clearer picture about geographical distribution of the effects we introduce into equation (1) dummies for Latin American and European emerging markets and their interaction terms with measures of negative and positive effects of BICs export incentives. The results are reported in Table 3.

Table 3 Geographical patterns

	Model 1	Model 2	Model 3
Constant	5,562 (0.875)***	5,172 (0.892)***	3,842 (0.94)***
$LnEX_{i,t-1,c}$	0,138 (0.001)***	0,137 (0.002)***	0,137 (0.002)***
$LnGDP_{tc}$	0,173 (0.033)***	0,152 (0.033)***	0,203 (0.035)***
ER_{tc}	-0,002 (0.0002)***	-0,003 (0.000)***	-0,002 (0.0002)***
$NE(BR\_EI)_{it}$	-0,202 (0.077)***	-0,256 (0.048)***	-0,228 (0.083)***
$NE(IN\_EI)_{it}$	-0,022 (0.017)	-0,02 (0.015)	-0,023 (0.018)
$NE(CH\_EI)_{it}$	-0,09 (0.107)	-0,181 (0.097)*	-0,114 (0.112)
D_Latin	Omitted due to collinearity	Omitted due to collinearity	Omitted due to collinearity
$NE(BR\_EI)_{it}$ ´ D_Latin	-0,213 (0.094)**		-0,074 (0.101)
$NE(IN\_EI)_{it}$ ´ D_Latin	-0,141 (0.039)***		-0,124 (0.041)***
$NE(CH\_EI)_{it}$ ´ D_Latin	-1,54 (0.313)***		-1,475 (0.328)***
D_EU	Omitted due to collinearity	Omitted due to collinearity	Omitted due to collinearity
$NE(BR\_EI)_{it}$ ´ D_EU	0,31 (0.127)**		0,223 (0.136)
$NE(IN\_EI)_{it}$ ´ D_EU	0,051 (0.027)*		0,047 (0.029)
$NE(CH\_EI)_{it}$ ´ D_EU	0,229 (0.225)		0,201 (0.235)
$PE(BR\_EI)_{it}$		1,072 (2.055)	1,152 (2.055)
$PE(IN\_EI)_{it}$		0,949 (0.593)	0,88 (0.594)
$PE(CH\_EI)_{it}$		4,885 (1.403)***	4,802 (1.404)***
$PE(BR\_EI)_{it}$ ´ D_Latin		-3,457 (2.35)	-3,635 (2.351)
$PE(IN\_EI)_{it}$ ´ D_Latin		-4,209 (0.958)***	-3,81 (0.963)***
$PE(CH\_EI)_{it}$ ´ D_Latin		15,452 (2.463)***	14,834 (2.469)***
$PE(BR\_EI)_{it}$ ´ D_EU		0,864 (5.594)	1,091 (5.595)
$PE(IN\_EI)_{it}$ ´ D_EU		6,23 (1.246)***	5,945 (1.249)***
$PE(CH\_EI)_{it}$ ´ D_EU		-7,731 (2.821)***	-6,97 (2.827)**
N.obs	529 276	469 785	469 785
R-sq	0.65	0.12	0.14

Note: Time/year dummies are included in all models; "country by industry" fixed effects.

From Models 1 and 3 we can see that negative effects of BICs export incentives are especially strong for Latin American emerging markets while for European emerging markets the respective effects approach zero. These results indicate that BICs export incentives especially hurt vulnerable Latin American emerging markets rather than more dynamic and successful Asian "tigers". As for European emerging markets, they might not depend that much on export competition with BICs due to their specific geographical location. In particular, competition from developed European countries might be more essential for them.

As for positive “GVCs linkages” effects coming from Chinese export incentives targeted at inputs, for Latin American countries they are even larger than for Asian emerging markets while for European emerging countries they seem to approach zero. In general, these results look rather plausible. In particular, our results indicate that usage of Chinese inputs and, in particular, their cheapness and availability are especially important for more vulnerable Latin American emerging countries.

The other interesting result is that there are positive “GVCs linkages” effects of Indian export incentives targeted at inputs for export of European emerging countries. This result points to the importance of cheapness and availability of Indian inputs for producers-exporters in European emerging markets.

In Table 4 we report industrial patterns of baseline results. In particular, we introduce into baseline equation (1) dummies for agriculture and food sector (altogether), textile and machinery sectors and their interactions with measures of negative and positive effects from BICs export incentives.

Table 4 Industrial patterns

	Model 1	Model 2	Model 3
Constant	7,212 (0.8282)***	6,077 (0.885)***	5,771 (0.887)***
$LnEX_{i,t-1,c}$	0,138 (0.001)***	0,137 (0.002)***	0,137 (0.002)***
$LnGDP_{tc}$	0,11 (0.031)***	0,114 (0.033)***	0,121 (0.033)***
ER_{tc}	-0,003 (0.0001)***	-0,002 (0.0002)***	-0,002 (0.0002)***
$NE(BR\_EI)_{it}$	-0,371 (0.064)***	-0,295 (0.048)***	-0,401 (0.069)***
$NE(IN\_EI)_{it}$	-0,019 (0.02)	-0,022 (0.015)	-0,025 (0.022)
$NE(CH\_EI)_{it}$	-0,086 (0.182)	-0,241 (0.097)**	-0,103 (0.201)
D_AGRI_FOOD	Omitted due to collinearity	Omitted due to collinearity	Omitted due to collinearity
$NE(BR\_EI)_{it}$ ´ D_Agree_Food	0,19 (0.114)*		0,246 (0.12)**
$NE(IN\_EI)_{it}$ ´ D_Agree_Food	-0,037 (0.059)		0,022 (0.064)
$NE(CH\_EI)_{it}$ ´ D_Agree_Food	-0,599 (0.52)		-0,273 (0.547)
D_TEXTILE	Omitted due to collinearity	Omitted due to collinearity	Omitted due to collinearity
$NE(BR\_EI)_{it}$ ´ $D\_Textile$	-0,238 (0.138)*		-0,256 (0.143)*
$NE(IN\_EI)_{it}$ ´ $D\_Textile$	-0,074 (0.03)**		-0,077 (0.031)**
$NE(CH\_EI)_{it}$ ´ $D\_Textile$	-0,347 (0.219)		-0,53 (0.237)**
D_MACHINE	Omitted due to collinearity	Omitted due to collinearity	Omitted due to collinearity
$NE(BR\_EI)_{it}$ ´ $D\_Machine$	0,254 (0.104)**		0,315 (0.114)***
$NE(IN\_EI)_{it}$ ´ $D\_Machine$	0,066 (0.03)**		0,068 (0.032)**
$NE(CH\_EI)_{it}$ ´ $D\_Machine$	0,278 (0.261)		0,356 (0.285)
$PE(BR\_EI)_{it}$		3,857 (1.321)***	3,817 (1.322)***
$PE(IN\_EI)_{it}$		0,864 (0.774)	1,073 (0.782)
$PE(CH\_EI)_{it}$		3,485 (1.347)**	3,404 (1.349)**
$PE(BR\_EI)_{it}$ ´ D_Agree_Food		-9,03 (2.712)***	-9,233 (2.717)***
$PE(IN\_EI)_{it}$ ´ D_Agree_Food		-0,211 (0.963)	-0,407 (0.97)
$PE(CH\_EI)_{it}$ ´ D_Agree_Food		7,866 (3.078)**	8,084 (3.088)***
$PE(BR\_EI)_{it}$ ´ $D\_Textile$		-14,791 (4.951)***	-15,147 (4.955)***
$PE(IN\_EI)_{it}$ ´ $D\_Textile$		-0,619 (2.781)	0,142 (2.8)
$PE(CH\_EI)_{it}$ ´ $D\_Textile$		19,642 (3.066)***	20,699 (3.078)***
$PE(BR\_EI)_{it}$ ´ $D\_Machine$		-14,407 (2.512)***	-14,067 (2.513)***
$PE(IN\_EI)_{it}$ ´ $D\_Machine$		-2,685 (1.547)*	-3,806 (1.573)**
$PE(CH\_EI)_{it}$ ´ $D\_Machine$		2,05 (3.43)	5,417 (3.485)
N.obs	529 276	469 785	469 785
R-sq	0.68	0.12	0.13

Note: Time/year dummies are included in all models; "country by industry" fixed effects.

According to the results in Table 4, negative effects from BICs export incentives for other emerging markets` export tend to crowd in textile sector while in machinery sector they approach zero.

As for positive “GVCs linkages” effects, those coming from China are larger in agriculture, food and textile sectors. Respective positive effects, which come from Brazilian export incentives, seem to exist only in sectors other than textile, machinery, agriculture and food.

7. MANUFACTURING VERSUS RESOURCE EXPORTERS

In this section, we test if effects of BICs export incentives for emerging markets` export depend on the level of sophistication of affected emerging markets` export structure. First, we introduce dummy for countries, which export mostly consists of manufacturing goods. These countries are Hong Kong, Czech Republic, Estonia, Hungary, Malaysia, Mexico, Poland, South Korea, Thailand, Turkey and Vietnam. Other emerging countries in our sample - Argentina, Chile, Colombia, Greece, Indonesia, Peru, Russia and Uruguay - export mostly resource-based goods (natural resources, related goods and agriculture&food goods). We include in equation (1) interaction terms of this dummy with measures of negative and positive effects. Second, we test for industrial patterns of these interactions using various industrial dummies. In particular, in Model 2 we test if countries with advanced/manufacturing export structure get differential effects in machinery sector and in Model 3 – in low and medium technology (altogether) and high technology industries. We utilize Lall (2000) classification to disentangle these industries. Results are presented in Table 4.

Table 5 Manufacturing versus resource exporters

	Model 1	Model 2	Model 3
Constant	5,804 (0.891)***	5,692 (0.892)***	5,764 (0.892)***
$LnEX_{i,t-1,c}$	0,137 (0.002)***	0,137 (0.002)***	0,137 (0.002)***
$LnGDP_{tc}$	0,133 (0.034)***	0,135 (0.034)***	0,135 (0.034)***
ER_{tc}	-0,002 (0.0002)***	-0,002 (0.0002)***	-0,002 (0.0002)***
$NE(BR\_EI)_{it}$	-0,464 (0.06)***	-0,466 (0.06)***	-0,463 (0.06)***
$NE(IN\_EI)_{it}$	-0,096 (0.029)***	-0,096 (0.029)***	-0,098 (0.029)***
$NE(CH\_EI)_{it}$	-0,767 (0.203)***	-0,771 (0.203)***	-0,774 (0.203)***
$PE(BR\_EI)_{it}$	-1,439 (1.09)	-1,425 (1.091)	-1,354 (1.091)
$PE(IN\_EI)_{it}$	-1,707 (0.721)**	-1,708 (0.721)**	-1,656 (0.722)**
$PE(CH\_EI)_{it}$	10.202 (1.496)***	10,185 (1.496)***	10,126 (1.496)***
$NE(BR\_EI)_{it}$ ´ D_Manuf	0,493 (0.091)***	0,419 (0.1)***	0,671 (0.128)***
$NE(IN\_EI)_{it}$ ´ D_Manuf	0,078 (0.031)**	0,055 (0.032)*	0,059 (0.047)
$NE(CH\_EI)_{it}$ ´ D_Manuf	0,65 (0.225)***	0,526 (0.231)**	0,462 (0.0355)
$PE(BR\_EI)_{it}$ ´ D_Manuf	1,319 (2.607)	1,135 (2.67)	-2,277 (2.807)
$PE(IN\_EI)_{it}$ ´ D_Manuf	3,829 (0.887)***	3,806 (0.9)***	2,475 (0.951)***
$PE(CH\_EI)_{it}$ ´ D_Manuf	-5,91 (2.082)***	-6,371 (2.145)***	-6,301 (2.663)**
$NE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		0,283 (0.166)*	
$NE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		0,078 (0.033)**	
$NE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		0,434 (0.26)*	
$PE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		3,948 (10.554)	
$PE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		0,489 (2.15)	
$PE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_Machine$		6,27 (4.786)	
$NE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			-0,417 (0.151)***
$NE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			0,025 (0.042)
$NE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			0,204 (0.316)
$PE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			21,879 (6.772)***
$PE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			5,461 (1.302)***
$PE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_LMtechInd$			0,169 (3.004)
$NE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_HtechInd$			0,321 (0.256)
$NE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_HtechInd$			0,072 (0.057)
$NE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_HtechInd$			0,163 (0.434)
$PE(BR\_EI)_{it}$ ´ D_Manuf´ $D\_HtechiInd$			1,052 (24.347)
$PE(IN\_EI)_{it}$ ´ D_Manuf´ $D\_HtechInd$			1,272 (2.776)
$PE(CH\_EI)_{it}$ ´ D_Manuf´ $D\_HtecgInd$			-5,679 (8.329)
N. obs.	469 785	469,785	469,669
R-sq	0.33	0.32	0.32

Note: Time/year dummies are included in all models; “country by industry” fixed effects.

From Model 1 we can see that negative competition effects of BICs export incentives crowd in emerging countries, which export mainly resource-based goods. Emerging markets with more sophisticated export seem to be rather immune to BICs export incentives. As for positive "GVCs linkages" effects, on the one hand, emerging markets with more sophisticated/manufacturing export tend to get larger positive effects from Indian export incentives targeted at inputs compared to emerging markets with less sophisticated/more resource-based export. On the other hand, emerging markets with more advanced export structure tend to get less positive effects from Chinese export incentives targeted at inputs.

From model 2 we can conclude that emerging countries with advanced export structure experience significantly less negative competition effects of BICs export incentives in machinery sector compared to emerging countries with less advanced export structure. Finally, from Model 3 we can conclude that in low and medium technology industries emerging countries with more advanced export structure get significantly more positive "GVCs" linkages effects compared to emerging countries with less advanced export structure.

8. CONCLUSIONS

In this paper, we empirically proved that export incentives implemented in one country have both negative and positive effects on export of other countries as trade theory suggests. Negative effects are due to competition in international markets and positive – due to input-output GVCs linkages. For our empirical test, we utilized recent data on BICs (Brazil, India and China) export incentives and export of a selection of emerging countries to examine how recently implemented BICs export incentives affected export of other large emerging economies.

Our results have important policy implications. In particular, though we clearly find that there are negative competition effects of aggressive export promotion policies for foreign countries` export, our results also indicate that they can be at least partially compensated by positive effects transmitted via GVCs. Literally, this means that participation in GVCs can help countries, and developing countries in particular, in standing out against unfavorable foreign trade policies.

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APPENDICES

Appendix 1

Table A1.1 List of emerging countries used in the study

European emerging countries	**Asian emerging countries**	**Latin American emerging countries**
Czech Republic Estonia Greece Hungary Poland Russia Turkey	Indonesia Malaysia South Korea Thailand Viet Nam	Argentina Chile Colombia Mexico Peru Uruguay

Appendix 2

Table 2.1. Descriptive statistics

Variable Obs	N.obs	Mean	Std. Dev.	Min	Max
$LnEX_{i,t,c}$	712,19	10,44	6,09	0,00	25,92
$LnGDP_{tc}$	727,34	26,43	1,09	23,69	28,43
ER_{tc}	727,34	112,56	35,03	6,73	293,66
$NE(BR\_EI)_{it}$	547,41	0,10	0,19	0,00	2,89
$NE(IN\_EI)_{it}$	563,04	0,25	0,54	0,00	9,47
$NE(CH\_EI)_{it}$	560,66	0,14	0,26	0,00	4,10
$PE(BR\_EI)_{it}$	558,31	0,05	0,08	0,00	0,44
$PE(IN\_EI)_{it}$	558,31	0,02	0,02	0,00	0,42
$PE(CH\_EI)_{it}$	558,31	0,14	0,09	0,00	0,50

Table 2.2. Correlation matrix

	$LnEX_{i,t,c}$	$LnGDP_{tc}$	ER_{tc}	$NE(BR\_EI)_{it}$	$NE(IN\_EI)_{it}$	$NE(CH\_EI)_{it}$	$PE(BR\_EI)_{it}$	$PE(IN\_EI)_{it}$	$PE(CH\_EI)_{it}$
$LnEX_{i,t,c}$	1,00								
$LnGDP_{tc}$	0,21	1,00							
ER_{tc}	0,05	0,43	1,00						
$NE(BR\_EI)_{it}$	0,15	0,03	0,08	1,00					
$NE(IN\_EI)_{it}$	0,23	0,10	0,04	0,15	1,00				
$NE(CH\_EI)_{it}$	0,30	0,12	0,00	0,13	0,33	1,00			
$PE(BR\_EI)_{it}$	-0,23	-0,12	0,24	0,23	-0,12	-0,15	1,00		
$PE(IN\_EI)_{it}$	-0,07	0,14	0,02	0,01	0,01	-0,02	0,05	1,00	
$PE(CH\_EI)_{it}$	0,02	0,29	-0,06	0,03	0,21	0,19	-0,06	0,21	1,00