

## **EX-POST ANALYSIS OF THE INFLUENCE OF TARIFF LIBERALISATION ON ASEAN EXPORTS**

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**Abstract:** 2015 became a year of formal establishment of ASEAN Economic Community, envisioned as a single common market and production base. And the success in achieving integration goals depends of economic effects, attained by the member countries at the previous stage of integration. This paper aims at conducting ex-post analysis and assessing empirically the trade effects of integration for ASEAN members within AFTA. The study focuses on how regional economic integration influences export volumes, the hypothesis proposed in the research is that regional economic integration has a cyclical nature: it's efficiency rises in the first years after formation of integration block, achieves maximum and then starts decreasing. According to the obtained results, AFTA economic integration potential has been exhausted. The highest efficiency of economic integration was achieved in 2005-2007. Although economic integration influences ASEAN exports in a positive way, efficiency of trade liberalization has lowered significantly in recent years.

**Keywords:** ASEAN, regional economic integration, trade liberalization, ASEAN Economic Community, welfare effects

**JEL classification:** F15, F43, C22

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### **1. Introduction**

Association of South-East Asian Nations, established in 1967 by 5 countries and expanded up to 10 members by 1999, has gone a long way from cooperation in certain areas, the creation of ASEAN free trade area (AFTA) and adoption of the Common Effective Preferential Tariff (CEPT) scheme in 1992 to the formation of a full-value Community. During the 12th Summit in 2007 the ASEAN leaders affirmed their strong commitment to create ASEAN Community by 2015 and the goal was fixed in the Cebu Declaration. As a result, 2015 became a year of formal establishment of ASEAN Economic Community.

In November 2015 ASEAN leaders adopted AEC Blueprint 2025, consisting of five interrelated and mutually reinforcing characteristics, namely: (i) A Highly Integrated and Cohesive Economy; (ii) A Competitive, Innovative, and Dynamic ASEAN; (iii) Enhanced Connectivity and Sectoral Cooperation; (iv) A Resilient, Inclusive, People-Oriented, and People-Centered ASEAN; and (v) A Global ASEAN.

The proviso in the document that “the immediate priority is to complete the implementation of measures unfinished under the AEC Blueprint 2015 by end-2016” witnesses that not all ASEAN member appeared to be completely ready to establish a

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full-fledged ASEAN Community in 2015 as it was declared earlier. Nevertheless, the formal creation of the Community means the countries' will to move towards closer integration.

A success in achieving integration goals depends to a certain extent on economic effects, attained by the member countries at the previous stage of integration. The higher positive influence of integration, its contribution to economic growth the higher the member countries' aspiration to shift to closer and more advanced integration.

This paper aims at conducting ex-post analysis and assessing empirically trade effects of integration for ASEAN members, influence of intra-regional tariff liberalization on export flows.

The research has the following objectives:

1. to analyze both qualitatively and quantitatively influence of economic integration within ASEAN in different periods after AFTA formation. The cut-off point of the qualitative ex-post analysis is 1993, when ASEAN free trade area was created. The quantitative analysis (based on log-log transformation of linear regression model) covers period from 2001 to 2015, and aims at calculating contribution of intra-regional tariff liberalization according to the CEPT scheme on ASEAN export growth.
2. to assess quantitatively influence of various export determinants on ASEAN export separately for each ASEAN member. Such an approach makes it possible to conduct comparative analysis and reveal individual features of each country.
3. to assess quantitatively effects of intra-regional tariff liberalization for exports in crisis years and compare effects before and after the global financial crisis 2008-2009 separately for each country in dynamics.
4. to compare effects of intra-regional tariff liberalization according to the CEPT scheme on exports in ASEAN-6 and ASEAN-4.

The research is organized as follows: Section 2 discusses theoretical background of integration, presents a literature review of the most prominent studies, exploring influence of regional economic integration in ASEAN and Asia on the whole, methodological approaches, underlying the studies and export determinants, used for the analysis. Section 3 describes the methodology, proposed in the current research and theoretical framework, supporting the chosen variables. Section 4 presents the results of qualitative analysis of intra-regional trade and investments, merchandise trade complementarity indices and economic growth indicators (GDP and GDP per capita) of ASEAN members after AFTA formation in 1993. Section 5 provides empirical results of the influence of intra-regional tariff liberalization on ASEAN exports, basing on log-log transformations of linear regression models. Integration effects in trade are calculated for all ASEAN members separately, according to the proposed methodology. Section 6 contains conclusions.

The results of the analysis will inform both researchers and policymakers about influence of various export determinants and tariff liberalization within AFTA on exports of ASEAN members in dynamics. The study helps to find those of ASEAN members, which benefit the most and the least from regional integration.

According to the obtained results, regional economic integration and tariff liberalization according to the CEPT scheme bring positive effects for export growth in all ASEAN members: both ASEAN-6 and ASEAN-4. At the same time, it has been proved empirically that integration effects for ASEAN-4 are relatively higher, as the countries' elasticity on trade weighted average tariff is higher in comparison with ASEAN-6. Positive influence of tariff liberalization on exports was relatively high in crisis years (2009, 2010 and 2015), when it mitigated negative influence of external shocks and contributed to more rapid recovery of national economic systems.

At the same time, qualitative analysis of various integration indicators (such as intra-regional trade share, intra-regional trade intensity index, intra-regional share of FDI inflow, cumulative FDI share, merchandise trade complementarity index), cumulative export growth and export growth in Priority Integration Sectors has proved that economic integration potential of AFTA has been gradually exhausting in post-crisis years (especially for ASEAN-6). The statement has been confirmed by the results of qualitative analyses (regression modeling). It has been proved that maximal values of tariff liberalization contribution to export in ASEAN-6 were achieved in 2008, being fueled by intensive tariff liberalization and demonstrated downward trend in post-crisis period.

## **2. Literature Review**

Ex-ante simulation as well as ex-post analysis of regional economic integration effects to evaluate influence of trade liberalization on intra-regional trade, economic growth and different aspects of economic welfare in integration countries are common approaches, widely used by researchers.

Different integration effects become objects for analysis: growth and welfare effects (GDP, real GDP, GDP per capita or GNI augmentation after formation of an integration block), trade effects (influence of regional economic integration on trade flows within the region), investment effects, labor market effects (integration impact on division of labor and unemployment figures), price effects (change in market prices as a result of economic integration) etc.

A number of studies analyze trade effects in different types of regional trade agreements (Martínez-Zarzoso and Nowak-Lehmann, 2004 assess Mercosur-European Union trade; Krueger, 1999 investigated trade effects within NAFTA etc.) and influence of trade reforms on the dynamics of trade flows with both members and nonmembers. Several studies attempt to examine the effects within ASEAN members (in AFTA), measure quantitatively the influence of trade liberalization in framework of intraregional trade liberalization schemes of trade flows.

Many academic papers are devoted to ex-ante simulation of potential integration effects; the researchers use various methods – trade indicators, SMART and GTAP-models (Kawai, 2007; Kawai and Wignaria, 2013; Urata and Kiyota, 2003; Zhang et al., 2006; Bergsten, Noland, and Schott, 2011 etc.).

A number of studies give an ex-post quantitative assessment of integration effects (mainly, trade effects) by applying a gravity model or various transformations of linear regression models (log-linear or log-log regression specifications). Export is considered as a function, which depends on various parameters; specifications of

regression models and sets of influencing variables depend on a basic hypothesis and objects of the research. UNCTAD experts (Fugazza, 2004) point market access indicators (including tariff rates, non-tariff barriers), commodity prices, macroeconomic environment (including exchange rate), inflows of foreign direct investments (UNCTAD, 2002), domestic transport infrastructure and institutions among key determinants of export.

Exploring dynamics of bilateral trade in an attempt to reveal factors influencing significantly on export performance, many researchers apply a variation of gravity model worked out by Krugman and Obsfeldt (2005), which bases on two independent variables - GDP and distances. The original model has been modified in various ways dependently on the hypotheses underlying the research.

Hapsari, Mangunsong (2006) and Okabe, Urata (2013) included the tariff rate levied by trade partners into their specifications of regression model as one of the key factors, affecting exports. Both exchange rate and tariff rates were found to have significant influence of India-US bilateral trade in the research by Aggarval (2004). Noureen and Mahmood (2014) included both exchange rate and FDI inflows, which are often excluded from regression models while exploring export performance. They proved that these factors influence significantly on both export dynamics and absolute terms, and its commodity structure (export diversification).

Dependently on the original hypothesis, a system of time or country specific dummies may be introduced into the specification of the regression model (Carrère, 2006). Exploring export performance to a wide range of countries, the researchers tend to use an FTA dummy, which takes a value of one when the main country forms a free trade area with its trading partner and zero otherwise (Okabe and Urata, 2013; Thangavelu, 2010; Haveman and Hummels, 1996. Elliott and Ikemoto (2004) modified gravity model including three types of dummy variables, while exploring intra-regional trade within ASEAN.

A huge number of studies focus on the effects of trade liberalization on trade flows in different regions, and include average tariff rate into regression specifications/Empirically the influence of trade liberalization on trade flows can be mixed. Some researchers reveal positive correlation between trade liberalization and exports (Weiss, 1992; Bleaney, 1999; Ju, Wu, Zeng, 2010). The other find little evidence of positive influence of trade facilitation on trade flows (Greenaway and Sapsford, 1994; Jenkins, 1996).

Most of the studies reveal positive influence of trade liberalization on imports (Santos-Paulino, 2002b; Ju, Wu, Zeng, 2010). At the same time some note that “imports increase comparatively quickly to trade liberalization than exports, thereby resulting in transitory trade imbalances” (Zakaria, 2014 with reference to Bertola and Faini, 1991; Khan and Zahler, 1985; Krueger, 1978; Santos-Paulino and Thirlwall, 2004). The study by Wilson, Mann, and Otsuki (2004) proves empirically significant economic gains from trade facilitation of individual countries.

Most of the studies, which explore trade liberalization effects on trade in ASEAN and included average tariff into the basic specification revealed a significant effect of tariff reduction in increasing intra-regional exports of ASEAN members (Elliot and Ikemoto, 2004; Aggarval, 2004). Hapsari and Mangunsong (2006) prove that trade liberalization

within integration block has a significant effect in boosting mutual trade between ASEAN members. The researchers conclude, that “further trade liberalization within ASEAN may also lead to further trade diversion”. Lee and Plummer (2011) show empirically that, regional integration and lower trade costs promote higher trade. Nevertheless, sectoral output adjustments show that regional integration may have different effects for various industries. It may become harmful for raw and low-tech industries of relatively more developed countries (for instance, for agricultural and petroleum products in Singapore). Okabe and Urata (2013) also stress that regional economic integration may bring different effects for integrating countries. Their contribution to the academic literature is in the fact that they show that in spite of positive overall effect “the trade creation effects of tariff elimination under the CEPT Scheme are relatively small and limited to a small number of products for the new AFTA members such as Cambodia, Myanmar and Vietnam compared to the old members”. Shepherd and Wilson (2008) highlight that ASEAN countries “enjoy considerable economic gains in trade from reform in trade facilitation”, stressing at the same time that the effects on trade flows (both imports and exports) vary considerably within the ASEAN countries.

The current study extends the scientific literature in two ways. First, the log-log transformation of linear regression model includes most of the factors/regressors, which may influence export performance of ASEAN members significantly. Extending the regression model we make an attempt to bear in mind peculiarities of economic strategies and key trends in economic development of ASEAN countries, for instance, their high dependence on foreign direct investments and commodity prices, attempts to manipulate exchange rates in order to increase exports etc. Second, the regression specifications are estimated for every particular ASEAN member; contribution of tariff liberalization to export growth are calculated in dynamics. This makes possible, on the one hand, to conduct comparative analysis of trade effects among ASEAN countries, and on the other hand, analyze integration effects in every particular countries in dynamics, revealing periods when contribution of regional integration into export growth reached its maximum. Empirical studies which focus on comparative analysis of trade effects in ASEAN are limited.

### 3. Theoretical Framework and Methodology

In order to attain the declared goals it's important to compose correct model, including all core factors, which may influence ASEAN exports significantly. Thus, a log-log transformation of linear regression model has been used. Export is considered as a function, depending on various parameters:

$$EXP = f(GNI, Tariff, FDI, OP, ER, Crisis, Period),$$

where EXP is export of goods and services, GNI is gross national income, Tariff is trade weighted average tariff, FDI is inflow of foreign direct investments, OP is oil prices, ER is exchange rate, Crisis is a dummy, measuring influence of global financial crisis 2008-2009 and Period is a time-specific dummy.

GDP is widely used in gravity equations, describing dynamics of export flows (Krugman and Obstfeld, 2005; Urata and Kiyota, 2003; etc.). In this study we suggest to include gross national income (GNI) as a wider indicator, which is calculated as

GDI plus income receipts from the rest of the world less income payments to the rest of the world (Pritzker, Arnold, Moyer, 2015). It can be reasonable to include GDP or GNI as an influencing parameter while analyzing bilateral trade flows of the country with its trade partners as in Hapsari and Mangunsong (2006), Aggarval (2004) etc. At the same time, if it's total exports that become an object of quantitative analysis (as in the current research), use of GDP may distort the results of regression modeling, as export is a main GDP component. In order to avoid distortions, we suggest to subtract export from GNI.

As one of the key purposes of the research is to measure trade liberalization influence on export flows, tariff rate is the second parameter, included into the regression model. The higher import elasticity on prices is and the higher export dependence on import (share of import components used for export goods and services) the higher potential influence of trade liberalization on exports can be. Customs duties increase transaction cost for both domestic production and export. "Trade liberalization is likely to affect both price and income elasticities of exports. For example, liberalization may increase the sensitivity of exports to price and income changes by allowing producers to move resources into traded goods sector by generating structural change and creating allocative efficacy." (Zakaria, 2014)

Foreign direct investments promote exports of host countries through various channels: augmenting domestic capital for exports, delivering technologies and new products for exports, facilitating access to new and large foreign markets etc. (UNCTAD, 2002). ASEAN countries demonstrate "...close relationship between economic growth and FDI inflows, a significant share of FDI inflows in the last three decades have been accompanied by high growth". At the same time, "decreases in FDI are normally followed suit by decreases in growth" (Merican, 2009). Thus, FDI inflow may become a significant parameter and needs to be included into the regression model.

Exchange rate is one more factor, which influences exports and growth significantly. IMF experts stressed in 1980s that exchange rates, being a measure of countries' competitiveness, can influence trade in many ways (IMF, 1984). Exchange rates may have strong impact on prices (balance between domestic and external prices) and consequently, on the allocation of resources and investment decisions. Wilson and Takacs (1979), Bahmani-Oskooee and Kara (2003) proved that devaluation of national increases export revenue in countries with both fixed and flexible exchange rate regimes. "Undervalued ER was key driver of Europe and Japan's postwar recovery" (Eichengreen, Leblang 2003; Eichengreen, 2008). According to Hausmann, Pritchett, and Rodrik (2004) growth accelerations fueled by growing exports tend to be associated with real depreciations of countries' national currencies.

Exchange rate has been one of the core instruments to attain success of export-led strategy in Asia, as "export-led growth is essentially about the advantages of keeping the prices of exportables high enough to make it attractive to shift resources into their production" (Krueger, 1998). Fang, Lai, and Thompson (2007) showed that depreciation stimulated bilateral export revenue across Asian economies during the 1980s and 1990s. Countries of the region took measures to prevent from appreciation of their national currencies (Zhai, 2010). Thus, the indicator has been included into quantitative analysis.

A number of economic studies were conducted on the trade channel of the transmission of oil price shocks to different economies: developed ones (Backus and Crucini, 2000), both developed and developing ones, including oil-exporting and oil-importing economies (Kilian, 2009). As most of emerging Asian countries are net importers of mineral resources (excluding Malaysia and Indonesia), and oil demand from emerging Asia is an important factor influencing global oil prices (Hamilton, 2013; Kilian and Hicks, 2013), changes in oil prices may influence export flows of ASEAN countries significantly. The influence may differ widely among ASEAN countries in terms of their oil dependency (Le, Chang, 2013).

Thus, drawing on insights from the studies, mentioned above we and according to the initial hypotheses offer a step-by-step approach, starting with the following specification of the regression model:

$$\ln EXP_{i,t} = \beta_0 + \beta_1 [\ln (GNI)_{i,t} - EXP_{i,t}] + \beta_2 * Tariff_{i,t} + \beta_3 * \ln FDI_{i,t} + \beta_4 ER_{i,t} + \beta_5 OP_t + \varepsilon$$

$EXP_{i,t}$  – exports of a country i at time t;

$GNI_{i,t}$  – gross national income of a country i at time t;

$\beta_1$  – elasticity of exports on GNI (excluding exports);

$Tariff_{i,t}$  – trade weighted average tariff rate in a country i at time t;

$\beta_2$  – coefficient, explaining percent change of export when trade weighted average tariff rate changes by 1 per cent point;

$FDI_{i,t}$  - inflow of foreign direct investments to a country i at time t;

$\beta_3$  – elasticity of exports on FDI inflows;

$ER_{i,t}$  – annual average exchange rate of dollar to the national currency of a country i at time t;

$\beta_4$  – coefficient, explaining percent change of export when exchange rate changes by 1 unit;

$OP_t$  - annual average oil price at time t;

$\beta_5$  – coefficient, explaining percent change of export when oil price changes by 1 US dollar;

$\varepsilon$  – error of the regression model that includes omitted variables and unobserved country effects.

In order to “clear” the result of the regression out of negative influence of the global financial crisis, on the second step of quantitative analysis the first specification has been modified by introducing a crisis dummy. The variable equals one for the country i in 2009, and zero otherwise.

$$\ln EXP_{i,t} = \beta_0 + \beta_1 [\ln (GNI)_{i,t} - EXP_{i,t}] + \beta_2 * Tariff_{i,t} + \beta_3 * \ln FDI_{i,t} + \beta_4 ER_{i,t} + \beta_5 OP_t + \beta_6 DV_{Crisis_t} + \varepsilon$$

$DV_{Crisis_t}$  – a crisis dummy at time t (equals 1 in crisis years and 0 otherwise);

$\beta_6$  – coefficient at a crisis dummy.

In recent years most of the Asian countries have started moving from outward-looking, export-oriented development strategies toward stimulation of national consumption as it is expected to be “much more pronounced in driving economic growth than exports” (Economic and Social Survey of Asia and the Pacific 2016). Nevertheless, the pace of this movement differs among Asian countries on the whole and ASEAN countries, in particular.

For the purpose to check a hypothesis that ASEAN countries started moving away from the export-led strategy of economic growth after the global financial crisis, one more dummy has been introduced on the last stage of regression analysis. This is a period dummy, which equals 1 in pre-crisis period and zero otherwise.

$$\ln EXP_{i,t} = \beta_0 + \beta_1 \ln(GNI_{i,t} - EXP_{i,t}) + \beta_2 * Tariff_{i,t} + \beta_3 * \ln FDI_{i,t} + \beta_4 ER_{i,t} + \beta_5 OP_t + \beta_6 DV_{Crisis_t} + \beta_7 DV_{Period_t} + \varepsilon$$

$DV_{Period_t}$  - a period dummy at time t (equals 1 in pre-crisis years and 0 otherwise);  
 $\beta_7$  - coefficient at a period dummy.

The empirical work considers data for 15 years (2001-2015), detailed description of variables find in Table 1. In order to solve the problem of non-stationarity of the time series data, it has been prematurely transformed to stationary form by differencing.

Table 1. Description of Variables

Variable	Definition	Source
<b>EXP<sub>i,t</sub></b>	The first difference of export of a country i at time t at constant price (2010) and purchasing power parities, billion dollars	World Bank Statistic Database
<b>GNI<sub>i,t</sub></b>	The first difference of gross national income at constant price (2010) and purchasing power parities of a country i at time t, billion dollars	World Bank Statistic Database
<b>Tariff<sub>i,t</sub></b>	Trade weighted average tariff rate in a country i at time t, %	WTO Tariff Analysis Online Database
<b>FDI<sub>i,t</sub></b>	The first difference of FDI inflow to a country i at time t at constant prices (2010), billion dollars	UNCTAD FDI Database
<b>ER<sub>i,t</sub></b>	Exchange rate of new local currency units of a country i at time t per US dollar extended backward, annual average	World Bank Global Economic Monitor Database
<b>OP<sub>t</sub></b>	Average annual OPEC crude oil price at time t, US dollars per barrel	U.S. Energy Information Administration
<b>DV<sub>Crisis<sub>t</sub></sub></b>	Crisis dummy at time t (equals 1 in crisis years and 0 otherwise)	

As trade liberalization (cuts in tariffs and elimination of non-tariff barriers of trade) is a foundation of regional economic integration, it’s important to focus on the coefficient  $\beta_2$ , which reflects influence of lowering tariffs on exports of integrating countries.

To calculate integration effect on export we apply the following equations:

$$IE\ Exp\ Growth_{i,t} = \beta_{2,i} * [Tariff]_{i,t} - [Tariff]_{i,t-1} * Intra\ reg\ Share\ Exp_{i,t}, \text{ где}$$



**IE Exp Growth<sub>i,t</sub>** – integration effect of export growth in a country i at time t;

**$\beta_{2,i}$**  – coefficient, explaining per cent change of export in a country i when trade weighted average tariff rate of the country i changes by 1 per cent point ( $\beta_{2,i}$  for each country from specification 3);

**Tariff<sub>i,t</sub> – Tariff<sub>i,t-1</sub>** – change of Average CEPT rates by country i;

**Intrareg Share Exp<sub>i,t</sub>** – share of export to ASEAN partners in overall export in a country i at time t.

#### 4. Key Trends of Regional Economic Development: Qualitative Analysis

Regional economic integration contributed largely to increasing exports and economic development of integrating countries. It promoted closer trade and investment relations within ASEAN. Regional integration resulted in higher share of intra-regional trade - from 19,65% in 1993 to 24,9% in 2006 (see Table 1) - and cumulated share of intra-regional foreign direct investments – from 8,24% in 1993 to 9,4% in 2006.

On most of the indicators a steady upward trend was observed up to 2005-2007. Export intensity index reached maximum in 2005, intraregional trade intensity index and intraregional trade share – in 2007. Regional integration promoted higher trade complementarity within ASEAN: merchandise trade complementarity index reached its maximum of 0,744 in 2006. Although FDI dynamics remained volatile during the whole period maximal cumulative FDI share was achieved in 2006 and FDI share – in 2008.

Besides, mid-2000s were a period of the highest export growth in Priority Integration Sectors, identified for accelerated economic integration (see Table 2). Economic integration stimulated mostly agricultural exports, especially such cultures, as rice. Unprecedented export growth in particular commodity positions, such as pharmaceuticals, rubber-based and automotive products was actual for 2002-2007. It makes sense to note that in long-run regional economic integration reinforced traditional export specializations of ASEAN members, preventing them from re-focusing towards production and exports of high-tech commodities. Traditionally competitive economic branches received higher benefits from economic integration<sup>1</sup>.

Relatively less developed ASEAN members (ASEAN-4) experienced postponed but faster growth in exports of goods and services in comparison with ASEAN-6. The postponed integration effects for ASEAN-4 can be explained by longer transition period of trade liberalization. ASEAN free trade area stimulated, mainly, production and export of labor-intensive goods: agricultural products, textiles and apparels that compose higher share of export in relatively less developed ASEAN-4 countries. Abundance of low-skilled labor in this group of countries and growth of intra-regional trade contributed to more rapid economic growth. Thus, these countries experienced higher GDP and GDP per capita growth in comparison with ASEAN-6 (see Table 3).

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<sup>1</sup> The same statement was proved empirically by Kien and Hazimoto (2005). Using gravity equation the researchers found that “even if there’s an increase on the bilateral trade between member countries, AFTA has not given rise to export trade diversion”.

Table 2. Dynamics of ASEAN Intra-Regional Trade and Investments Indicators<sup>2</sup>

Indicator	Cumulative FDI Share (%)	FDI Share (%)	Intra-regional Trade Intensity Index	Intra-regional Trade Share (%)	Export Intensity Index	Merchandise Trade Complementarity Index
1993	8,24		3,29	19,65	3,69	
1994	9,16		3,33	21,34	3,89	
1995	9,15		3,13	21,14	3,67	
1996	9,12		3,14	21,26	3,63	
1997	8,94		3,24	21,39	3,65	
1998	8,82		3,77	21,07	4,25	
1999	8,21		3,79	21,76	4,14	
2000	7,79		3,70	22,74	3,99	
2001	8,28	11,53	3,82	22,15	4,13	
2002	8,96	23,78	3,88	22,64	4,20	0,707
2003	9,31	9,50	4,27	24,43	4,58	0,733
2004	8,83	8,86	4,23	24,43	4,60	0,736
2005	8,81	9,77	4,25	24,87	<b>4,68</b>	0,739
2006	<b>9,40</b>	13,53	4,22	24,85	4,64	<b>0,744</b>
2007	8,86	11,13	<b>4,34</b>	<b>24,94</b>	<b>4,67</b>	0,741
2008	9,29	<b>20,76</b>	4,20	24,87	4,57	0,719
2009	9,22	14,24	3,95	24,33	4,20	0,715
2010	9,22	15,34	3,75	24,64	3,98	0,71
2011	9,22	17,72	3,67	24,14	3,92	0,699
2012	9,22	16,22	3,61	24,36	3,78	0,702
2013	9,22		3,59	24,31	3,75	
2014	9,22		3,57	24,22	3,63	
2015	9,22		3,29	23,56	3,35	

Source: Regional Integration Indicators. Asian Regional Integration Center: [www.aric.adb.org](http://www.aric.adb.org) and *United Nations Conference on Trade and Development* (Original data <http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx>).  
 Uploaded by Knoema. at: <http://knoema.ru/UNCTADMTC2013/merchandise-trade-complementarity-annual-1995-2012> (accessed 06.12.2016).

Table 3. Export Growth in Priority Integration Sectors' Products, % at current prices

	1993-2002	2002-2007	2007-2012	1993-2013
Agricultural Products	2,8	18,4	10,7	8,9
Manufacturing Products	7,9	14,8	6,1	9
Rice	2,4	21,7	9,5	9,1
Cane Sugar	2,3	14,6	15,7	9,2
Pharmaceutical Products	5,1	57,2	7	16,8
Rubber-Based Products	1,2	23	11,3	9,3
Wood-Based Products	8,2	10,6	-2	5,6
Fisheries	0	15	-5,3	1,9
Textiles and Apparels	0,4	13,5	7,3	5,6
Electronics	10,7	17,3	-1,7	8,4
Automotive Products	5,4	34,1	9,7	13,3

Source: ASEAN Community in Figures. Special Edition 2014. ASEAN. P. 45, 51.

<sup>2</sup> See final note on Trade Complementarity Index.

All ASEAN members experienced the highest pace of economic growth in 2002-2007. This can be explained, on the one hand, by growing demand on foreign markets that stimulated Asian exports and brought high export incomes and, on the other hand, by maximal efficiency of regional integration.

#### 4. Empirical Results

Tables 4-6 present the results of the regression analysis in ASEAN export. The empirical results show that three specifications for all ASEAN members are significant and coefficients of determination vary from 0,92 to 0,99. The Philippines are the only exclusion with R<sup>2</sup> from 0,82 in Specification 1 to 0,9 in Specification 3.

Table 4. Dynamics of ASEAN Economic Welfare Indicators, %<sup>3</sup>

	1993-2002	2002-2007	2008-2014*
<b>GDP per Capita Growth, % at current prices</b>			
Brunei Darussalam	1,79	14,15	3,04
Cambodia	1,94	13,27	8,21
Indonesia	4,96	15,71	8,57
Lao	3,52	19,44	13,60
Malaysia	3,98	11,92	6,67
Myanmar	2,36	25,01	15,35
Philippines	1,80	10,86	8,08
Singapore	3,71	12,31	5,58
Thailand	1,58	13,38	5,80
Viet Nam	12,26	15,97	12,36
<b>ASEAN</b>	<b>3,79</b>	<b>15,20</b>	<b>8,73</b>
<b>ASEAN-6</b>	<b>2,97</b>	<b>13,05</b>	<b>6,29</b>
<b>ASEAN-4</b>	<b>5,02</b>	<b>18,42</b>	<b>12,38</b>
<b>GDP Growth, % at current prices</b>			
	1993-2002	2002-2007	2008-2015
Brunei Darussalam	4,28	16,10	-0,64
Cambodia	6,17	15,06	9,77
Indonesia	6,40	17,36	13,25
Lao	5,63	20,69	12,43
Malaysia	6,44	13,98	6,94
Myanmar	3,42	25,80	13,17
Philippines	3,98	13,12	8,61
Singapore	6,41	14,52	5,14
Thailand	2,52	14,31	5,19
Viet Nam	14,00	17,25	16,65
<b>ASEAN</b>	<b>5,93</b>	<b>16,82</b>	<b>9,05</b>
<b>ASEAN-6</b>	<b>5,01</b>	<b>14,90</b>	<b>6,41</b>
<b>ASEAN-4</b>	<b>7,31</b>	<b>19,70</b>	<b>13,01</b>

<sup>3</sup> in 2015 most of the countries faced negative pace of GDP per capita growth. The exclusions were three less developed ASEAN members – Cambodia, Lao and Vietnam – and the Philippines with minor positive growth of 100,66%. To avoid distortions 2015 was excluded from calculations. Source: author’s calculations based on World Economic Outlook Statistic Database. 2015. IMF, April.

Table 5. Dependence of ASEAN exports on various parameters (specification 1)

	Y	ln (GNI-EXP)	Tariff	ln FDI	Exchange Rate (ER)	Oil Price (OP)	R <sup>2</sup>
<b>Brunei Darussalam</b>	9,231	-0,042	-0,026**	-0,038**	-0,267	0,011***	0,986
<b>Indonesia</b>	7,701	0,282**	-0,032**	0,009**	0,000***	0,009***	0,977
<b>Cambodia</b>	15,204	0,435	-0,166**	-0,114	0,002***	0,003***	0,967
<b>Lao</b>	1,153	0,603**	-0,006**	0,131**	0,000***	0,007***	0,976
<b>Myanmar</b>	6,291	0,153	-0,071*	0,045	0,000***	0,007***	0,929
<b>Malaysia</b>	9,386	0,015***	-0,044**	0,034**	0,471*	0,011***	0,972
<b>Philippines</b>	7,339	0,185*	-0,004**	0,082*	0,009**	0,002***	0,817
<b>Singapore<sup>1</sup></b>	12,954			0,108*	-1,204	0,003***	0,938
<b>Thailand</b>	9,932	0,301*	-0,057**	0,020**	-0,043**	0,002***	0,992
<b>Viet Nam</b>	10,594	-0,279	-0,083**	0,215	0,000***	0,001***	0,977

\*, \*\* and \*\*\* statistically significant at 10, 5 and 1% significance level, respectively. F-statistics in significant at 1% for all countries. <sup>1</sup> First two variables has been excluded from the model for Singapore, as 1. its average weighted tariff is near to zero for a long period of time. The country only applies tariffs on alcohol, tobacco, gasoline and motor vehicles; 2. export exceeds the value of gross national income. Source: author’s calculations

Table 6. Dependence of ASEAN exports on various parameters (specification 2)

	Y	ln (GNI-EXP)	Tariff	ln FDI	Exchange Rate (ER)	Oil Price (OP)	DV Crisis	R <sup>2</sup>
<b>Brunei Darussalam</b>	9,160	-0,038	-0,024**	-0,049**	-0,234	0,011***	-0,001*	0,987
<b>Indonesia</b>	7,577	0,284*	-0,019*	0,008**	0,000***	0,009***	-0,125*	0,978
<b>Cambodia</b>	12,736	0,655	-0,160**	-0,139	0,002***	0,001***	-0,132	0,968
<b>Lao</b>	1,107	0,606**	-0,006**	0,130*	0,000***	0,007***	0,017	0,976
<b>Myanmar</b>	10,529	-0,355	-0,140*	0,077*	0,001***	0,007***	0,587	0,975
<b>Malaysia</b>	7,917	0,013***	-0,017**	0,060**	0,752	0,013***	-0,188*	0,989
<b>Philippines</b>	6,234	0,296*	-0,032**	0,054*	0,009**	0,001***	-0,167	0,854
<b>Singapore<sup>1</sup></b>	12,929			0,109*	-1,194	-0,004***	-0,004*	0,938
<b>Thailand</b>	10,894	0,270*	-0,051***	0,030**	-0,059***	0,001***	-0,108**	0,996
<b>Viet Nam</b>	-4,228	1,116	-0,070**	0,313*	0,000***	-0,003***	-0,846	0,984

\*, \*\* and \*\*\* statistically significant at 10, 5 and 1% significance level, respectively. F-statistics in significant at 1% for all countries. <sup>1</sup> First two variables has been excluded from the model for Singapore, as 1. its average weighted tariff is near to zero for a long period of time. The country only applies tariffs on alcohol, tobacco, gasoline and motor vehicles; 2. export exceeds the value of gross national income. Source: author’s calculations

In all specifications, where significance of “GNI minus Export” parameter has been confirmed, there is positive correlation: the higher incomes, the higher exports. This is particularly true for Lao, where a 1 percent increase in GNI (excluding exports) may increase national exports by 0,6% (see specifications 1 and 2).

The variable “Tariff” is significant in all specifications and the coefficient demonstrates inverse direction consistently with the theoretical models. Thus, tariff liberalization results in higher exports (in short run), but the influence depends on the country. Relatively less developed countries – Cambodia, Myanmar and Vietnam may win the most from trade liberalization in absolute terms.

Table 7. Dependence of ASEAN exports on various parameters (specification 3)

	Y	ln (GNI -EXP)	Tariff	ln FDI	Exchange Rate (ER)	Oil Price (OP)	DV Crisis	DV Period	R <sup>2</sup>
<b>Brunei Darussalam</b>	9,930	-0,051	-0,022**	-0,025*	-0,718	0,010***	-0,001*	0,104	0,988
<b>Indonesia</b>	7,735	0,272	-0,016*	0,009**	0,000***	0,009***	-0,033*	0,020	0,978
<b>Cambodia</b>	7,741	0,320	-0,112**	-0,030	0,000***	0,001***	-0,397	-0,348	0,979
<b>Lao</b>	2,729	0,267	-0,005**	0,189*	0,000***	0,008***	-0,168	-0,482	0,982
<b>Myanmar</b>	12,321	-0,495	-0,185*	0,035*	0,001***	0,008***	0,525	-0,229	0,978
<b>Malaysia</b>	7,942	0,011***	-0,017**	0,060**	0,753	0,013***	-0,182*	0,026*	0,989
<b>Philippines</b>	4,291	0,504*	-0,053*	0,023*	0,004**	0,001***	0,063	0,355	0,903
<b>Singapore<sup>1</sup></b>	15,859			0,100*	-2,987	-0,003***	-0,005*	0,434	0,972
<b>Thailand</b>	13,590	0,014*	-0,069***	0,069**	-0,056***	0,000***	-0,184**	0,202*	0,998
<b>Viet Nam</b>	-8,130	1,096	-0,028*	0,315*	0,000***	-0,001***	-0,396	0,759	0,987

\*, \*\* and \*\*\* statistically significant at 10, 5 and 1% significance level, respectively. F-statistics in significant at 1% for all countries. <sup>1</sup> First two variables has been excluded from the model for Singapore, as 1. its average weighted tariff is near to zero for a long period of time. The country only applies tariffs on alcohol, tobacco, gasoline and motor vehicles; 2. export exceeds the value of gross national income. Source: author’s calculations based

Results for FDI variable support in most cases the theoretical assertion: the higher inflow foreign direct investments to ASEAN economies, the higher export. Brunei Darussalam was the only case where the variable was significant, but the coefficient was negative, that means inverse correlation between exports and FDI flows.

In most cases exchange rates shows a positive and significant effect on exports from ASEAN countries. In the panel data exchange rate has been measured as a number of national currency units per 1 US dollar. Thus, the more expensive dollar is, the cheaper the national currency. Positive correlation in most cases confirms basic statements of theoretical models. Thailand has become the only country where the calculations are inconsistent with the expected results and the correlation is negative (and significant) in all three specifications. Increase in exports in Thailand has been accompanied with appreciation of national currency. The reason is probably the high price competitiveness of export commodities, when even appreciation of national currency doesn’t deprive export goods of their attractiveness for foreign importers.

Mixed results have been received for the oil price variable. Its significance has been confirmed in all specifications and countries. At the same time, although it had been expected that there would be different results for exporters (Indonesia, Malaysia, and Brunei Darussalam) and importers of mineral fuels, the countries from both groups demonstrates positive correlation between oil prices and export values. There are only two countries – Singapore and Vietnam, where higher oil prices hamper export and lower prices result in its increase. This can be probably explained by difficulties in determination of causality between the two factors. On the one hand, the inverse causality between two parameters could take place: rising oil demand from emerging Asia, associated with high export revenues and economic growth, was an important factor influencing global oil prices. On the other hand, relatively successful economic performance on developed markets in pre-crisis period stimulated both global trade growth (and consequently, export revenues received by export-led emerging market

economies) and oil prices. Thus both parameters – ASEAN export and oil priced were influenced by some third factors and changed in the same direction. At the same time basic statements of theoretic model can be indirectly confirmed by the coefficients of oil prices. In all specification the coefficients were the highest in the three oil-exporting economies – Indonesia, Malaysia and Brunei.

On the second step of the quantitative analysis a crisis dummy variable has been introduced into the regression specification. The idea was to “clear” export flows out of negative effects of the Global financial crisis. The crisis dummy has been significant in a half of countries and in all cases the sign of the coefficient has been negative, meaning that in crisis years decrease (or slower growth) of export was caused by the negative influence of external factors.

On the third step of the analysis we introduced a period dummy variable to reveal differences in export performance in ASEAN countries before and after the Global financial crisis. This was an attempt to check the hypothesis that export-led model of economic growth has exhausted, and export has been gradually losing the role of key driver of economic growth. The factor has been significant only for two countries: Malaysia and Thailand, demonstrating direct correlation. Thus, export performance in these two countries was much more successful in pre-crisis period. This is particular relevant to Thailand where the respective coefficient is much higher (0,2 against 0,03 for Malaysia). Lowering export in recent years and decreasing efficiency of the export-led economic growth model has resulted in a package of macroprudential reforms, aiming at searching for new drivers of the Thai economy. Thailand is expected to attain success in its movement to consumption-led growth. Thailand was among those, using fiscal instruments for private consumption stimulation relatively more actively. In late 2015, the country introduced a new package of short-term stimuli worth \$9.58 billion that was to be directed mainly to SMEs in the form of loans and tax breaks. Besides, in August 2015 the Government launched the National Savings Fund, which is going to provide social insurance for the self-employed. Besides, the country cut interest rates three times for the period between 2013 and early 2014 and twice in the first half of 2015.

Significance of specifications and Tariff variables for all countries allows calculating contributions of tariff liberalization within the integration block to the export growth according to the proposed methodology.

The results of the calculations are summarized in Table 7. The calculations show that all ASEAN members have gained from trade facilitation, accelerating export growth. Negative values of ASEAN-6 in 2009 are caused by increase of average CEPT tariff rates in response to external challenges.

Nevertheless, it remains obvious, that impacts across countries are different. These differences in trade effects may arise from differences in the countries’ consumption patterns, production behavior and share of intra-regional exports in total exports.

Quantitative analysis allows both comparing integration effects for different ASEAN members, determining countries, getting maximal gains within integration blocks and evaluating efficiency of economic integration in dynamics. Lao, Vietnam and Cambodia are among those, getting the highest benefits. Cambodia faced the highest contribution of tariff liberalization to export growth in 2009. Relatively high elasticity of national exports on tariff rates, intensive tariff liberalization of trade with ASEAN

partners and stronger intra-regional trade mitigated negative consequences of the global financial crisis and contributed to more rapid economic recovery in post-crisis period.

Table 8. Contribution of tariff liberalization within AFTA to ASEAN export, %

	<b>Brunei Darussalam</b>	<b>Cambodia</b>	<b>Indonesia</b>	<b>Lao</b>	<b>Malaysia</b>	<b>Philippines</b>	<b>Thailand</b>	<b>Vietnam</b>
2015	0,003	0,792	0,003	0,204	0,004	0,006	0,014	0,248
2014	0,001	0,024	0,001	0,010	0,001	0,002	0,004	0,009
2013	0,005	0,283	0,004	0,084	0,005	0,008	0,018	0,145
2012	0,001	0,779	0,001	0,207	0,001	0,003	0,005	0,393
2011	0,001	0,195	0,001	0,037	0,001	0,002	0,003	0,074
2010	0,201	0,550	<b>0,249</b>	0,099	<b>0,317</b>	<b>0,873</b>	<b>1,151</b>	0,198
2009	-0,004	<b>0,999</b>	-0,003	0,173	-0,004	-0,008	-0,015	0,270
2008	<b>0,466</b>	0,608	<b>0,171</b>	<b>0,238</b>	0,236	0,413	0,840	<b>0,447</b>
2007	0,273	-0,031	0,131	-0,012	0,182	0,354	0,621	-0,023
2006	0,033	0,604	0,018	0,234	0,027	0,055	0,086	0,442
2005	0,054	0,239	0,030	0,097	0,044	0,092	0,150	0,273

Source: author’s calculations

In most ASEAN countries, maximal tariff liberalisation effects on exports were observed in 2008, on the eve of the global financial crisis. After strengthened protectionism (ASEAN-6) and restrained tariff liberalization (ASEAN-4) in 2009, in 2010 most of ASEAN-6 faced with strong increase of trade facilitation contribution to their export growth. This primarily relates to Thailand, the Philippines, Malaysia and Indonesia. The same trend took place in 2015, when intensive liberalization provided relatively higher contribution to export growth.

The empirical results show, that maximal trade effects, fueled by intensive tariff liberalization in ASEAN-6 were achieved in 2008 and contributed to relatively faster recovery in 2010. Since 2011 positive effects remained low, as potential for further liberalization has exhausted. Nevertheless, in 2015 relatively more intensive tariff liberalization pushed export growth in all ASEAN members and contribution of intra-regional trade facilitation was higher in comparison with 2014. Thus, it was regional economic integration that stimulated export growth amid contemporary crisis tension. ASEAN-4 face more equal distribution of trade liberalization effects during the whole period.

### 5. Conclusions

The aim of the paper was to assess empirically trade effects of integration for ASEAN members (influence of intra-regional tariff liberalization on export flows) and calculate contribution of intra-regional tariff liberalization according to the CEPT scheme on ASEAN export growth in dynamics for every particular country.

Quantitative ex-post simulations based on the log-log transformation of regression model together with qualitative analysis of statistic data result in a very important fundamental conclusions.

Regional economic integration and tariff liberalization bring positive effects for export growth in all ASEAN members: both ASEAN-6 and ASEAN-4. Nevertheless, the contributions of tariff liberalization to export growth differ across the countries. Integration effects for ASEAN-4 are relatively higher, as the countries’ elasticity on

trade weighted average tariff is higher in comparison with ASEAN-6. This has been proved empirically. Besides, the effects were postponed due to longstanding transition period, higher initial tariff rates and prospects for trade liberalization.

At the same time, there is evidence that AFTA economic integration potential has been gradually exhausting in post-crisis years. On most of indicators, the maximal integration effects were achieved in 2005-2008: this was a period of the highest merchandise trade complementarity index; these years demonstrated the highest export growth of some commodities, in particular, in priority integration sectors; 2007 became a year of maximal intra-regional trade share (and intra-regional trade intensity index), 2006 was a year of the highest cumulative FDI share and 2008 – of the highest intra-regional share of FDI inflow. Mid-2000s was a period of unprecedented export growth and the highest export growth in Priority Integration Sectors. Besides, maximal values of tariff liberalization contribution to export in ASEAN-6 were achieved in 2008, being fueled by intensive tariff liberalization.

ASEAN-4 face more equal distribution of trade liberalization effects during the whole period due to higher potential for further tariff liberalization.

Positive influence of tariff liberalization on exports was relatively high in crisis years (2009, 2010 and 2015), when it mitigated negative influence of external shocks and contributed to more rapid recovery of national economic systems. Nevertheless, the overall trend of contribution of regional economic integration to export growth in ASEAN-6 seems to be downward because of low potential for further tariff liberalization.

Contribution of tariff liberalization to exports has a cyclical character, as it depends not only on elasticity but on tariff liberalization schemes. Member countries tend to maximize potential gains in periods with the most intensive trade liberalization and then move towards “new quality” of economic integration. This may be achieved by welcoming new members and enlarging integration block, as according to various studies “broader FTAs generate higher welfare and output gains for member countries” (Estrada, G., Park, D., Park, I. and Park, S. 2011, 2012). That’s why, it’s expected, that efficiency of ASEAN+1 integration scenarios (especially ASEAN+China and ASEAN+Republic of Korea) will be relatively higher in the near future. The second way to get higher benefits is to reach advanced stage of integration (common market), to create full-fledged ASEAN Economic Community. But potential effects will be observed in long-run.

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#### Final Note on Trade Complementarity Index:

According to the Asian Regional Integration Center (ARIC) Methodology: Export intensity index is the ratio of export share of a country/region to the share of world exports going to a partner. An index of more than one indicates that trade flow between countries/regions is larger than expected given their importance in world trade. Intra-regional trade intensity index is the ratio of intra-regional trade share to the share of world trade with the region, calculated using total trade data. An index of more than one indicates that trade flow within the region is larger than expected given the importance of the region in world trade. As of October 2013, intra-regional trade bias are computed as the ratio of intra-regional trade share (exports plus imports) to the region's share to total world trade (exports plus imports). Data downloaded prior to October 2013 computed bias using exports and is therefore not comparable to current share values. Intra-regional trade share is the percentage of intra-regional trade to total trade of the region, calculated using total trade data. A higher share indicates a higher degree of dependency on regional trade. As of October 2013, intra-regional trade shares are computed as the percentage of intra-regional trade (exports plus imports) to total world trade (exports plus imports). Data downloaded prior to October 2013 computed shares as the percentage of intra-regional exports to average exports to world and is therefore not comparable to current share values. Cumulative foreign direct investment (FDI) share is the percentage of regional FDI inflows to total FDI from the investing region beginning 1995. Data is available for 26 regional member countries. A higher share indicates a stronger preference for the region and a higher degree of integration. Foreign direct investment (FDI) share is the percentage of regional FDI inflows to total FDI from the investing region. Data is available from 1995 at the earliest for 26 regional member countries. A higher share indicates a stronger preference for the region and a higher degree of integration.