EMPIRICAL ESSAYS ON SPATIAL ECONOMICS

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ABSTRACT

Intra-industry trade (IIT) approach is widely believed to entail low transitional adjustment costs in relative production factors. First chapter of thesis examines labor adjustment costs of EU industries with trade relation of NAFTA on industry-level via the perspective of IIT over 36 months period. Results have shown that high economic performance and dominant free trade approach impact trade blocks in a positive way but a financial turmoil cripples IIT by lowering bilateral trade amounts. Second chapter aims to capture marginal IIT levels of trade of industry sectors in 25 developing countries with 34 developed countries and compare its adjustment costs pattern. Evaluating marginal IIT patterns in diversifying adjustment costs is main approach for examining the correlation between trade liberalization and adjustment costs. Dual index application with newly introduced graphical resolution, Trade Concentration Space (TCS) are crucial for robust results of developing countries with respect to identifying industries as contracting, neutral and expanding via trade liberalization process. Third and last chapter focuses on the geographical region determinants as a weight matrix. The main motive is here to move beyond singular two-fold relations and aim to confine the effect of IIT on job turnover while monitoring the rest of relevant variables by using newly introduced weight matrix. A spatial two-stage least squares model (S2SLS) is applied as main method for measuring marginal IIT relation between regional trade pattern and labor market adjustment costs. In first stage, Euclidean distance spatial model is applied to calculate regional weights in EU-28 and in second stage the distinctive impact of variables have shown in empirical results.

ÖZET

Endüstri içi ticaret (IIT) yaklaşımının, nispi üretim faktörlerinde düşük geçişli geçiş maliyetlerini sağladığına inanılmaktadır. Tezin birinci bölümü, NAFTA ile ticaret ilişkisine sahip AB endüstrilerinin işgücü ayarlama maliyetlerini, 36 aylık süre içinde IIT perspektifiyle incelemektedir. Sonuçlar, yüksek ekonomik performansın ve baskın serbest ticaret yaklaşımının ticaret bloklarını olumlu yönde etkilediğini, ancak finansal kargaşaların iki taraflı ticaret miktarlarını azaltarak IIT'yi bozduğunu göstermiştir. İkinci bölüm, gelişmekte olan 25 ülkenin sanayi sektörlerinin ticaret ilişkilerinin olduğu gelişmiş 34 ülke ile arasındaki marjinal IIT seviyelerini yakalamayı ve ayarlama maliyetleri modelini karşılaştırmayı amaçlamaktadır. Düzenleme maliyetlerini çeşitlendirmede marjinal IIT kalıplarını değerlendirmek, ticaret serbestleştirmesi ve uyum maliyetleri arasındaki ilişkiyi incelemek için ana yaklaşımdır. Yeni uygulamaya konulan grafiksel çözünürlük, Ticaret Konsantrasyon Alanı (TCS) ile çift endeks uygulaması, gelişmekte olan ülkelerin sanayilerini gelişen, sabit ve gerileyen endüstriler olarak tanımlayan sağlam sonuçlar için çok önemlidir. Üçüncü ve son bölüm, coğrafi bölge belirleyicilerine bir ağırlık matrisi olarak odaklanmaktadır. Ana neden, tekil iki kat ilişkilerin ötesine geçmek ve IIT'nin iş döngüsüne etkisini sınırlamak ve yeni eklenen ağırlık matrisini kullanarak ilgili değişkenlerin geri kalanını izlemektir. Bölgesel ticaret modeli ile işgücü piyasası ayarlama maliyetleri arasındaki MIIT ilişkisini ölçmek için ana yöntem olarak mekansal iki aşamalı en küçük kareler modeli (S2SLS) uygulanmıştır. İlk aşamada, AB-28'de bölgesel ağırlıkların hesaplanması için Öklid mesafeli mekansal model uygulanmış ve ikinci aşamada değişkenlerin ayırt edici etkileri deneysel sonuçlarda gösterilmiştir.

To my mom and dad…

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List of Abbrevations

ASEAN	Association of Southeast Asian Nations
EEC	European Economic Community
EU	European Union
G-20	Group of Twenty Member Countries
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GE	Generalised Entrophy Index
GL	Grubel-Lloyd Index
GMT	Gravity Model of Trade
HIIT	Horizontal Intra-industry Trade
IIT	Intra-industry Trade
IMF	International Monetary Fund
INTERREG	European Territorial Co-operation
ISIC	International Standard Industrial Classification
ITB	Industry Trade Box
MERCOSUR	Common Market of South
MIIT	Marginal Intra-industry Trade
NAFTA	North American Free Trade Aggreement
NEG	New Economic Geography
NTT	New Trade Theory
PQS	Product Quality Space
S&P500	The Standard and Poor's 500 Index
SAH	Smooth Adjustment Hypothesis
SAR	Spatial Autoregressive Models
STIC	Standard International Trade Classification
TCS	Trade Concentration Space
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
US	United States
VIIT	Vertical Intra-industry Trade

Chapter 1. Trade-Induced Adjustment on Financial and Labor Markets: A Financial Turmoil Case

ABSTRACT

This paper examines labor adjustment costs of EU industries with trade relation of NAFTA on industry-level via the perspective of intra-industry trade (IIT) over 36 months period (July 2006 to July 2009). IIT approach is widely believed to entail low transitional adjustment costs in relative production factors. Results have shown that high economic performance and dominant free trade approach impact trade blocks in a positive way but a financial turmoil cripples IIT by lowering bilateral trade amounts. Furthermore, trade decline between EU and NAFTA stimulated volatility in adjustment costs and reasoned for turbulences within most EU industries.

Jel Classification:

Jel no. F19, F1, R3

Keywords: International economics, intra industry trade, new economic geography

1. INTRODUCTION

Intellectual pillars of spatial economics have staggering features for economists since the last couple of decades. Spatial dimension on economic researchs has been accelerated by improvement in measurement methods via new trade theory (NTT) and new economic geography (NEG). The emergence of theoretical developments in spatial economics amasses academic interest.

Interpretation of new empirical concepts such as intra-industry trade (IIT) and general equilibrium models enlarges a number of documental works on spatial implications of industry sectors at both country and regional levels.

Empirical researchs began to use various methods to separate economic geography's naturally extensive literature. Therefore the allocation of scarce resources over space and activities of crowded economic agents would be classified at broad, intermediate and narrow scales. In a point of circular logic, the process of clustering similar industries occurs at minor levels like industrial districts to suburbs of cities and finally economic regions with similar aspects as Silicon Valley or the City of London. Agglomeration economics answers the intermediate and small-scale clusters in economic regions[1] but it cannot fully explain the system of broader levels of economic regions with its sizes and roles (Krugman, Fujita, Venables, 1999).

International economics has been focused on this deeper regional integration between economic agents (EU, NAFTA, MERCOSUR, ASEAN etc.) and single country (The UK, US etc.) framework to supply the field of unified markets in the world.[2] These deep regional integration formations are endeavored to foster

[1] *At broader level,* economic geography analyses the economic activities in certain regions like 'US manufacturing belt' (area that covers Portland, Baltimore, St. Louis, and Green Bay) or its European twin 'Blue Banana' (Southeast England, the famous Ruhr Valley, South East France, Southern Germany and Northern Italy). *At the intermediate level,* economic geography intends to relate a linkage on international trade levels between national boundaries and the existence of important cities in particular countries such as İstanbul and Turkey. *At small scale agglomerations*, any industrial district within the specific feature that differentiates itself from the rest of the world can be observed by us. 'Economic regions such as Silicon Valley or the City of London embody similar industries with different aspects rather than foreign rivals of these industries. The nature of development in these small area agglomerations is the proof of a solid cumulative process' (Simonis, 2002).

[2] Greenway, D. (1987), Brulhart, M. (2008), Ulusoy, V. and Çakır, N. (2009), Fabiani, S. and Galuscak, K. (2010).

production levels and increase bilateral trade among member countries (Clark, Fullerton, Burdof, 2001). Bilateral trade flows would be occurred in two ways: inter-industry trade or intra-industry trade. The former, inter-industry trade, includes trade flow between two economic regions with different product types like textiles for automobile parts. Trade liberalization policies foster the factor reallocation in production process within existed industry sectors but in terms of inter-industry trade, reallocation of labors to different sectors increases the substantial damages on job gains and job losses. In other words, shifting labors from an industry to another will create an absence of specialization that ends up with a considerable amount of labor adjustment costs. Eventually, unmatched labor supply for existing industries and subsequent labor demand conditions will create rigidities on factor prices and factor mobility within inefficiencies in labor market (Ulusoy, Çakır, 2009).

Intra-industry trade (IIT), on the other hand, entails much smaller adjustment costs while reallocating existing production factors within similar segments of the industry. In order to capture temporary effects of trade liberalization process on labor market adjustment costs, IIT has been accepted as a measure. Balassa (1966) presented an index of IIT to examine a relationship between increasing trend in both IIT percentage and free trade approach among European Community members.

This paper primarily relates IIT with labor adjustment costs to measure the hazardous impacts of Bubble Crisis on EU labor market in terms of EU-NAFTA bilateral trade data from the beginning date of July 2006 to official end July 2009. Time period includes thirty-six month period for capturing impacts of the financial crisis that long for fifteen months period from January 2008 to July

2009. Our research uses an extended version of well-known (Azhar, Elliot, Milner, 1998) industry trade box approach.[3] Trade box uses processed data on exports and imports for 2992 product types by examining the dynamics of monthly driven fluctuations in IIT. Secondarily, competitiveness levels of EU products in both domestic and foreign perspectives is added as an auxiliary tool for explaining adjustment costs in financial turmoil. A modified version of competitiveness matrix is presented by us to aid to complete this goal. Both approaches are expected to provide insight for policymakers in designing reforms to stabilizing labor market in financial crisis periods.

Section two focuses on brief research on literature of spatial development in Western World and IIT implications for economic multinational regions on labor market adjustment, section three explains the background methodology for trade-box approach and our competitiveness matrix in an explicit way. Section four reveals the results of both approaches and also combines these results into single chapter for better understanding. Section five summarizes the results and provide insight for policymakers in such financial turmoil periods. Consequently, section six set our final contributions to spatial economic literature.

2. LITERATURE REVIEW

2.1. Spatial Development in Western World

Spatial economics determines the geographic location of economic activity which was located in such particular region and why it was located in

[3] Ever since that first work of Azhar and Elliot on trade box, two-up still improve trade box to supply more understanding (Azhar and Elliott (2003), Azhar and Elliott (2006a).

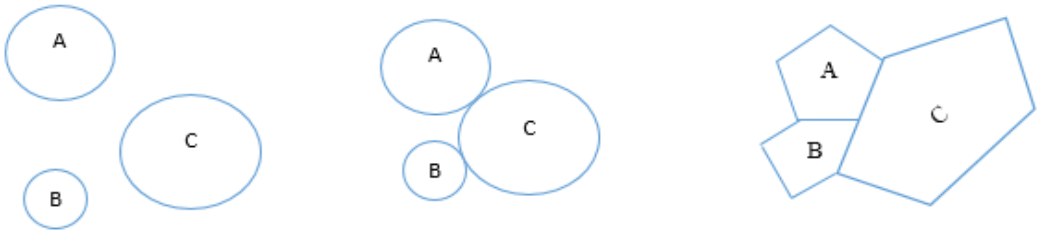
that region. The very first publication in spatial economics is stated by German economist Johann Heinrich von Thünen, in his publication 'The Isolated State' (1826).[4] Von Thünen focused agricultural production paradigm in rural areas with perspective on decaying amount of Ricardo's economic rent by transportation costs of agricultural products. He argued that the distance between a specific agricultural good and the marketplace is affected by several reasons and at the end producers (farmers, landlords) choose their products via those variety. Due to his solid observations in rural areas, actually the transportation costs vary the economic rent of different agricultural products for different landscape usage and intensity of these differentiated products have been formed in the periphery of the marketplace (or town center).

Von Thünen has been oversimplified his assumptions on his location theory, but it might be useful for us to remember that he observed production sectors in the 19th century with oversimplified production complexity or non-complexity. The isolated stages of a single economic community have no more place in real, recent world. But the major proportion of economic activities is still driven by self-interests of both individuals and firms while deciding in their efforts in particular trade regions and why they locate in those regions. Individuals choose locations for maximizing their utilities and living standards while firms target specific locations for maximizing their revenues or minimizing their costs. Although the absence of complexity in von Thünen's work does not deceive you because he is accepted as the forefather of economic geography by

[4] 'Der Isolierte Staat' in German.

concentrating his research on both agricultural production and economics education.

Globalization process has been accelerated just after Second World War and deeper financial and economic integration between different parts of the world could not be neglected by researchers anymore. Research on spatial economics has been increased dramatically by avoiding the general prejudice on it as intractable. It started to boost in the end of 20th century by planning the unification of European Market as a whole European Union (EU) and attempted to understand the trade interconnection between regions (states) for the US. In this context, we are inspired by Lösch's work (Lösch, 1940) and implement his idea on domestic firms that located in identical hexagonal regions to internationally attached global firms that located in differently sized hexagonals;



-First Stage- Before Globalization Process Started

-Transition Stage- After Second World War, trade zones increasingly started to interact with each other

-İntegrated Markets Stage- NAFTA (1996) and EU (2000) have been formed up with multi-country structure

Figure 2.1. Stages of multiple countries in trade integration.

Country A and B are European countries in first two stages, A and B form up as EU in the last stage. Country C is North American countries and in last stage it

represents NAFTA. Economic geography had to wait until Dixit-Stiglitz (1977) model based upon monopolistic competition to overcome such non-complexity critics for von Thünen's. After the adaptation of Chamberlain's concept of monopolistic competition into spatial economics, it stepped forward to estimate industrial agglomeration and international trade flow in specific regions. New models and approaches removed technical barriers and provide productive ground for spatial economics literature.

In theoretical paradigms, neo-classical and new trade models ignite debate over two main areas of spatial economics for evaluating the characteristic of economic sectors within multiple countries: international trade and regional economics. International trade goes into two divisions which are IIT and inter-industry trade while regional economics involves specialization and agglomeration of industries in specific production locations. The mainstream of spatial economics focuses on international trade. It favors trade specialization to promote peculiar economic sectors with similar inputs by shifting their locations. In addition to that, trade expansion in similar products (IIT type trade flow) significantly lowers adjustment costs in one of the main production factor (labor) while increasing its mobility to 'more developed' economic regions.

Wage rigidities, technological progress and increasing rate of imported goods are main sources for rising adjustment costs in labor market. These effects might be neutralized in long-run as labor market theories suggested, but in short-term these cause market imperfections, the downward trend in trade volume (export-based) and decreasing nominal wages.

In theory, positive elements in Hecksher-Ohlin (H-O) model with monopolistic competition overcome negative effects of Stolper-Samuelson model. For instance, the IIT will be reasoned for structural unemployment but it can be absorbed by positive impacts of product variety. In the perspective of H-O model, similar factor endowments with dispersed industries in a wide range of sectors and the range of differentiated goods reshape the consumer's preferences toward to the different varieties of similar products. In long run, gains from trade will overcome negative effects of adjustment costs in short-run. Although there is no equilibrium model for this argument, in the perspective of game theory, the sum of positive effects compensates job loss impacts in labor market. The fact that, the reallocation within the same industry on both managerial and working class is much easier than different industries (Jones, 1971; Helpman and Krugman, 1985). Eventually, trade liberalization and economic integration of specific region with other economic regions increase the competition between companies in the same industry which accelerates the relocation of labors in terms of job gains and job losses circle.

IIT creates product differentiation and fosters competition pressures while increasing welfare gains from bilateral trade. In theory, increasing trend in IIT provides a favorable environment for resource reallocation and adjustment costs in labor market which we called as 'Smooth Adjustment Hypothesis' (SAH).[5] In the last couple of decades shows us to the everlasting economic and trade integration approves the SAH by increasing the specialization in specific industries with country borders (Clark, 2002). So actually, SAH defines a

[5] SAH is first developed by Balassa (1966), after almost two and a half decades later, it is refined by Greenaway and Milner (1986) and Brülhart and Elliot (2002).

situation in labor markets have lower adjustment costs in terms of unused resources with a higher proportion of IIT in overall trade volume.

On theoretical approaches, there is two mainstream competition approaches in SAH, oligopolistic competition, and monopolistic competition. According to oligopolistic approach (Brander-Krugman 1983 model), a factor reallocation cannot be defined by a decline of a firm's share in domestic market but an increase in foreign sales. On the other hand, monopolistic approach states (Dixit-Stiglitz 1977 model) IIT creates product differentiation and changes consumer preferences by reshaping the consumer attitudes towards product diversification, to obtain positive impacts on earnings of individuals (labors). In other words, accelerating trade openness will enjoy all labors by creating benefits of product diversity, while they are both the earning and consuming class in the production process.

This paper embodies over finding reasonable answers to those questions 'Are multi-country production and consumption network (sub-regional trade blocs like EU and NAFTA) in two-way trade flows of similar products capture the crucial points in labor market adjustments?' and 'Does modified competitiveness matrix comforts the necessity for gaining a higher level of understanding on results of industry trade box? Let's assume that the answer to the second question approves a positive feedback. So, under what restrictions competitiveness matrix provides unique information for policymakers and industry owners?'

Answering those questions will provide a multi-country framework to examine spatial effects of IIT between economic regions in the perspective of labor

market adjustments. Also in the light of the second question, we provide a better perspective on both domestic and international competition among various domestic industry sectors with applying our solid restrictions.

3. METHODOLOGY

Grubel-Lloyd (1975) index is used for measuring adjustment costs on trade groups for multi-country framework,

$$GL = \frac{(\mathrm{Xi} + \mathrm{Mi}) - \mathrm{IXi} - \mathrm{MiI}}{(\mathrm{Xi} + \mathrm{Mi})}$$

, where export and import levels for trade partner *i* are presented by X_i and M_i. Range from 0 to 1, closer values to '1' it shows IIT percentage dominance over total trade volume while '0' shows inter-industry trade accumulation. GL index is used to IIT type measurement method for obtaining Industry Trade Box (ITB) on trade groups for multi-country framework capture crucial points on adjustment cost problems.

3.1 Reading Codes in Industry Trade Box

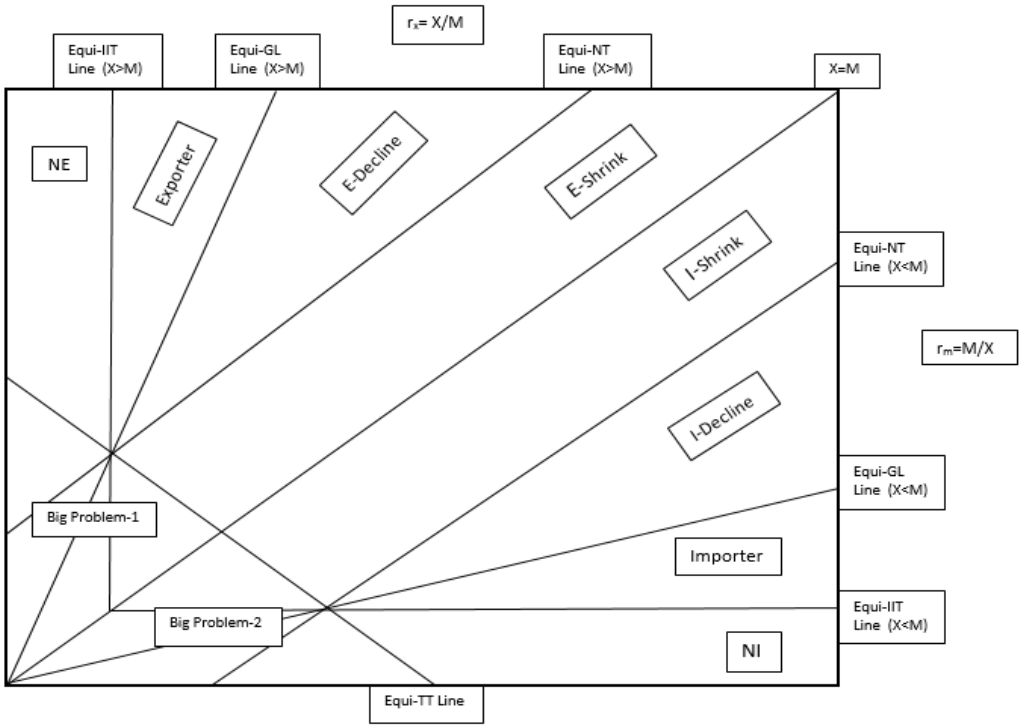


Figure 2. Industry Trade Box Regions

Industry trade box reflects dimensions of trade values in bilateral trade actions. Export and import data are used to obtain those attainable points. The combination of these points for an economic agent is structured by the values of GL index, TT (total trade), IIT and NT (net trade).

45^0 line represents a perfect bilateral trade performance (X=M) and bisects box into two symmetrical regions; at the left side, except Big Problem-1 region, four regions have consistently higher exported goods than imported goods while total trade volume is higher from the previous time period. On the contrary, the right side of 45^0 line brings forward domestic industries that crumble in competition against imported goods while total trade volume still increases in their trade zone. According to SAH, industries in the region with export surplus face none or low adjustment costs in the transitional process for the labor market. The

regions with import surplus contain industries with a medium amount of adjustment costs. Lastly, two regions in decreasing total trade area have higher adjustment costs rather than rest of all regions in trade box. Thus, our paper has focused on these ten regions to identify the overall adjustment costs of nine industry sectors by including the various data from bilateral trade from July 2006 to July 2009.

In the export surplus region, r_x contains four regions above the equi-TT line which are NE, Exporter, E-Shrink, E-Decline. All of these regions are not expected to experience substantial adjustment costs while exported goods overcome imported goods unless E-Decline region could not hold its position in r_x consecutively two time periods. NE (Net Exporter) region covers industries trade performance for increasing exports despite falling IIT levels but adjustment problem is not expected. Increase in IIT levels but fall in IIT percentage in TT put industries in Exporter region with no expected adjustment costs.

In E-Shrink region IIT levels increase relatively to TT for industry sectors but NT (X-M) begins to move the unstable situation in favor of imported goods. Although an industry sector in this region should not face spectacular adjustment costs according to SAH. The turning point of the export-surplus area is E-decline where an increase in ITT relatively to TT, but if TT experiences large increase, r_x falls with a drop in exports and rise in imports. This region is held by relatively small changes in TT, and if an industry keeps its trade performance for exporting more products than importing similar products there will be no adjustment costs.

The import-surplus area begins with I-Decline region, industry in this region experience an increase in IIT and IIT/TT, and even sometimes imports may fall relatively to exports due to a sharp increase in TT. Switching from r_x area to r_m area might cause low adjustment problems or casual impacts of structural changes in trade zone. Such as trade liberalization process or infant industry establishment which needs to be imported intermediate goods. I-Shrink region follows I-Decline region withholding same aspects but NT becomes more volatile in favor of exports (X-M). Both of these regions may ease the pressure of adjustment costs problems with holding their industries in increasing trend in TT line. Low adjustment costs may expect in these regions.

Percentage of imported goods in the domestic market quite exceed exported goods in particular industry section. In other words, when an industry could not overcome NT growth exceeds IIT, adjustment problems arise. Importer region faces increases in IIT but falls in IIT to TT, with having falling NT trend, The situation put industries in Importer region with a medium level of adjustment costs in reallocation unused resources within the industry.

SAH identifies high adjustment cost regions with NI, Big Problem-1, and Big Problem-2 regions. Firstly, Big Problem-1 region still replaces itself in r_x area, it suffers from a decline in total trade due to several reasons; such as broken trade agreements, wars or financial crises. Secondly NI and Big Problem-2 regions losing more ground in IIT rather than another region in this import-surplus area. IIT decreases with IIT to TT ratios fall place industry sectors in NI and Big Problem-2 is affected by the tremendous decline in TT performance with hazardous effects of adjustment costs. All of these three regions are expected to suffer substantial adjustment costs in labor markets. Detailed

analysis by using ITB gives us the opportunity to visualize these adjustment problems in labor market.

Our elaborated data contains 2992 products in nine industry sector headlines that obtained from Eurostat Database (1-digit STIC Rev.4) in terms of national currency (Euro) for European Union countries. Time period range in data is monthly-driven and admitted time boundaries for empirical research withholding the hazardous effects of Global Crises in July 2006 to July 2009.

3.2 Competitiveness Matrix (Modified Version)

We also created a supplementary tool called as Modified Trade Competitiveness Matrix for analyzing ITB results as structural time periods for policymakers. By applying this matrix we hope to create a better understanding of the performance of industry sectors in STIC levels. The motivation behind creating such a matrix, we are aware of the static feature of industry trade box and hope to widen its' perspective by adding a subsidiary tool. Modified Competitiveness Matrix has been created to answer such a need for measuring both domestic and foreign competitiveness levels of industry sectors in unstable situations like financial turmoil. By adding such a supplementary tool to ITB, we level up the understanding of ITB results in highly volatile time periods without catching into static traps of ITB. Summary of our findings supports our motivation and strengthens insights of ITB in further research.

3.3 Assumptions on Matrix

In our matrix we have two main areas to focus; these are domestic and foreign competitiveness levels for each industry. Accordingly, to capture relative adjustment costs among different industry sectors, our paper analyzes

the competition performance of domestic industry to other domestic industries within the country. The process of measuring domestic competitiveness level focuses on a single industry's percentage change of overall total trade between time periods (Delta TT_i) for capturing the features of domestic competitiveness level between industries of a country or trade group. The data is obtained from Eurostat Database as monthly calculated bilateral trade data. For domestic competitiveness level;

$$\Delta TT_i = \Delta\left(\frac{TTit}{TTjt}\right)$$

ΔTT_i is here for comparing industry *i*'s total trade amount among other domestic industries, TT_{it} is total trade performance of domestic industry i in given time period t and TT_{jt} is overall total trade performance of all domestic industries in given time period t.

Global competition among various firms in foreign markets is another crucial aspect that we focused on. We assume a change in unit value index of a single product in certain time period provides useful insight for comparing this product with its' foreign rivals in the same time period. Labor adjustment costs substantially exist in relative production factors so production output of a single domestic industry with a weighted average mean of it measures that products unit value. The unit value index is obtained from Eurostat Database as an indicator for global competitiveness level of various products under same STIC level:

$$UVI_i = \frac{\sum(WiRi)}{\sum Wi}$$

UVI_i stands for unit value index for industry i, W_i is weighted average mean and R_i is the production output of an industry i, UVI has been calculated by trade value of a product (i) is divided by its quantity.

3.4 Restrictions on Matrix

Our matrix contains four different regions such as *Rising Star, Declining Star, Missed Opportunities,* and *Retreats.* According to SAH, monopolistic competition goals conduct firms and other economic agents to locate their operations with the optimum amount of resources. Due to increase in international integration in the 20th century, spatial economics should focus on foreign competitiveness level as well as domestic competition. We suggest our modified competitiveness matrix to implement an answer to this blank area in literature.

Rising Star region includes industries with increasing trend in both domestic and global competitiveness level. Total trade percentage of single industry among others exceeds its former performance ($\Delta TT_{it} > \Delta TT_{it-1}$) while product quality in sector increases as well ($\Delta UVI_t > \Delta UVI_{t-1}$). For particular industries is challenging both increase its product quality by investing R&D ($\Delta UVI_t < \Delta UVI_{t-1}$) and maintain its trade volume in increasing trend ($\Delta TT_{it} > \Delta TT_{it-1}$). Such these industries are aggregated in *Declining Star* region.

Decreasing its total trade share among other domestic industries ($\Delta TT_{it} < \Delta TT_{it-1}$) while increasing its overall product quality ($\Delta UVI_t > \Delta UVI_{t-1}$), positions an industry into *Missed Opportunity* region. The possible worst situation for the industry is accrued under decreasing trends in domestic and global competition strengths ($\Delta TT_{it} < \Delta TT_{it-1}$, $\Delta UVI_t < \Delta UVI_{t-1}$) among its rivals in region *Retreats*.

In the process of decision-making, policymakers benefit from our Modified Competitiveness Trade Matrix along with ITB while applying policies affect the fate of industry sectors. The same monthly-driven date is used as ITB data. The bilateral trade data is obtained from Eurostat Database for the percentage change in ΔTT for domestic competition among industries, UVI is also obtained from Eurostat Database as an indicator for global competitiveness level of various products under same STIC level.

4. RESULTS

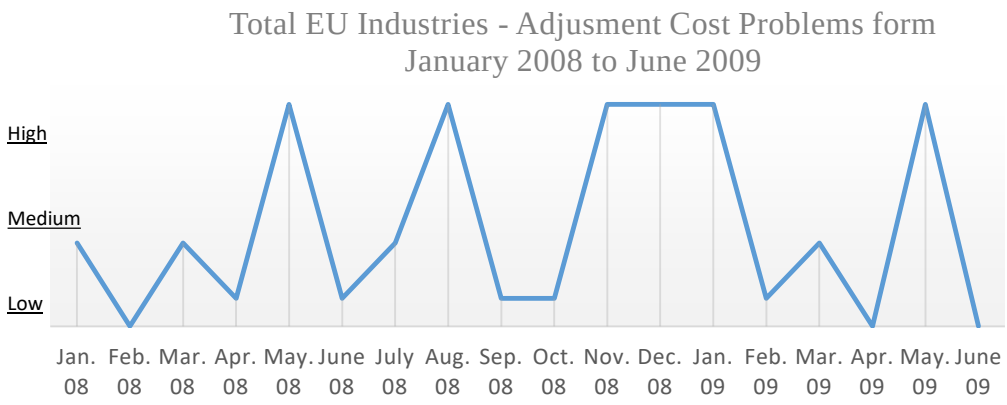


Figure 3. Crucial break points in Subprime Mortgage Crisis for EU industries

Crucial points are identified in the historical development of Bubble Crises to compare our findings with ITB results. Chronologically speaking, the time period between the late of December 2007 and the beginning of January 2008 was the official beginning of Crisis.[6] United States (US), the major partner of NAFTA was suffering from an economic recession that reasoned from subprime mortgages. A tremendous decline in the subprime mortgage system

[6] Official beginning and ending dates for 2008 Financial Crisis are obtained from Global Financial Association (2009) and Guillen, M. (2009).

had started to infect US financial markets. Obviously, in table 2, there is a decline in Jan. 2008 for all 1-digit STIC Rev.4 EU industry sectors which are also the beginning of rising unemployment levels in EU due to the break out point of Crisis. Following the trace behind our ITB findings, we achieved a solid connection between the crucial points in Crisis and the fluctuation in unemployment levels in EU industries.

In the first year of Crisis, 2008, unemployment levels in EU industries experienced multiple up-and-downs with a high level of fluctuation of labor forces between different industry sectors. In April 2008, US government decided to step up and got behind the wheel of crisis by taking control of Freddie Mac and Fannie Mae. These two firms actually worth over $6tn worth of subprime mortgages market.[7] The intervention of US government paid itself and EU industries welcomed this news positively with a sharp increase with moving into green regions in ITB.

In May 2008, although US Secretary Hank Paulson said 'I do believe that the worst is likely to be behind us', EU industries experienced sharp decline and positioned in adjustment problems area (Big Problem 1- 2). Tremendous pressure on subprime-mortgage owners has been eased by government intervention in the US by bailing out Freddie Mac and Fannie Mae at August 2008 to September 2008 period. That decision of US government might increase domestic support in the US, however, adjustment costs in Europe continent experienced raising adjustment costs from medium to high levels.

[7] Freddie Mac and Fannie Mae have value at almost 50% of the entire world in subprime mortgages market.

Between October 2008 and February 2009 is the most catastrophic months for EU industries with high adjustment costs on the reallocation of unused resources. Bailing outs of US government did not still put out crisis fire in both domestic and international markets, in addition to that October 2008 the hardest month for Dow Jones in whole crisis 18-month time period. Due to the recession in those days, eight Central Banks (including European Central Bank) dropped their interest rates by 0.5% to relieve debt borrowers. However, almost 477.000 European become jobless in that era which effected EU industries to fall back into Big Problem areas with increasing adjustment costs and decreasing total trade performances (240,000 Americans became jobless in EU countries).

The first half of 2009 could be believed recovery process for EU industries to get back on their feet. Unfortunately, in January 2009, Danish parliament agreed to a bailout package for its domestic mortgage providers as $17.6b which created another panic wave in EU market. In addition to that, the same time period is the starting point of the worst downfall that S&P500 has experienced in its history by 18.62%. February and March were passed by summits between world political leaders and financial gurus for compromising into a midpoint decrease substantial damage of crisis to the global economy. Summits and global attention on crisis provide a situation for EU industries to increase their TT performances and re-supply job opportunities for became unemployed EU citizens in the former period. Eventually, in April 2009 G-20 country leaders agreed to stimulate a global money supply package worth of $5tn. At the end, two months after this decision, the adjustment costs are reasoned by crises fell down to low levels and June 2009 has been noted as the official end date of crisis in history.

Table 1. ITB Regions for EU industries before financial crisis

SITC / TIME	July 06	Aug. 06	Sep. 06	Oct. 06	Nov. 06	Dec. 06
Food and live animals	**Big Problem-2**	**E-Decline**	**Exporter**	**I-Decline**	**NI**	**NI**
Beverages and tobacco	**Big Problem-1**	E-Shrink	Exporter	NE	Big Problem-1	Big Problem-1
Crude materials, inedible, except fuels	**I-Decline**	NI	I-Decline	Importer	Big Problem-2	Big Problem-2
Mineral fuels, lubricants and related materials	**Big Problem-1**	Exporter	Big Problem-1	E-Decline	NE	NE
Animal and vegetable oils, fats and waxes	**E-Decline**	NE	E-Decline	E-Decline	NE	Big Problem-1
Chemicals and related products, n.e.s.	**NE**	E-Decline	NE	E-Decline	NE	Big Problem-1
Manufactured goods classified chiefly by material	**NE**	E-Decline	NE	Exporter	NE	E-Decline
Machinery and transport equipment	**NE**	E-Decline	NE	E-Decline	NE	E-Decline
Miscellaneous manufactured articles	**NE**	Big Problem-1	Exporter	Exporter	Exporter	Big Problem-1
	Jan. 07	**Feb. 07**	**Mar.07**	**Apr. 07**	**May.07**	**June 07**
Food and live animals	**NI**	**Big Problem-2**	**NE**	**NI**	**I-Decline**	**E-Decline**
Beverages and tobacco	**Big Problem-1**	Exporter	E-Shrink	E-Decline	NE	E-Decline
Crude materials, inedible, except fuels	**Importer**	Big Problem-2	I-Decline	Big Problem-2	I-Decline	NI
Mineral fuels, lubricants and related materials	**E-Decline**	E-Shrink	NE	Exporter	E-Decline	NE
Animal and vegetable oils, fats and waxes	**E-Decline**	NE	NE	E-Decline	NE	E-Decline
Chemicals and related products, n.e.s.	**Exporter**	E-Decline	Exporter	Big Problem-1	E-Decline	NE
Manufactured goods classified chiefly by material	**E-Decline**	NE	E-Shrink	Big Problem-1	Exporter	Exporter
Machinery and transport equipment	**E-Decline**	NE	Exporter	E-Decline	E-Decline	NE
Miscellaneous manufactured articles	**E-Decline**	Exporter	NE	Big Problem-1	NE	NE
	July 07	**Aug. 07**	**Sep. 07**	**Oct. 07**	**Nov. 07**	**Dec. 07**

Food and live animals	**NI**	**I-Decline**	**Importer**	**Importer**	**Big Problem-2**	**NI**
Beverages and tobacco	**E-Shrink**	E-Decline	NE	E-Shrink	Big Problem-1	Big Problem-1
Crude materials, inedible, except fuels	**I-Shrink**	I-Shrink	Big Problem-2	NI	Big Problem-2	I-Decline
Mineral fuels, lubricants and related materials	**E-Decline**	E-Decline	NE	E-Shrink	E-Decline	Big Problem-1
Animal and vegetable oils, fats and waxes	**NE**	E-Decline	NE	E-Decline	NE	NE
Chemicals and related products, n.e.s.	**NE**	NE	E-Decline	NE	Big Problem-1	Big Problem-1
Manufactured goods classified chiefly by material	**NE**	Big Problem-1	E-Decline	Exporter	Big Problem-1	Big Problem-1
Machinery and transport equipment	**NE**	E-Decline	NE	Exporter	Big Problem-1	Big Problem-1
Miscellaneous manufactured articles	**Exporter**	Big Problem-1	Big Problem-1	Exporter	Big Problem-1	Big Problem-1

Table 2. ITB Regions for EU industries during financial crisis

SITC06/TIME	**Jan. 08**	**Feb. 08**	**Mar.08**	**Apr. 08**	**May.08**	**June 08**
Food and live animals	**Importer**	**Big Problem-2**	**NI**	**I-Decline**	**NI**	**I-Decline**
Beverages and tobacco	**NE**	Exporter	E-Decline	NE	E-Decline	E-Shrink
Crude materials, inedible, except fuels	**Importer**	Big Problem-2	I-Shrink	I-Decline	Big Problem-2	NI
Mineral fuels, lubricants and related materials	**E-Decline**	Big Problem-1	NE	E-Decline	Exporter	E-Shrink
Animal and vegetable oils, fats and waxes	**E-Decline**	E-Decline	E-Decline	NE	Big Problem-1	NE
Chemicals and related products, n.e.s.	**Exporter**	NE	E-Decline	Exporter	Big Problem-1	Exporter
Manufactured goods classified chiefly by material	**E-Decline**	NE	E-Decline	Exporter	E-Shrink	Big Problem-1
Machinery and transport equipment	**E-Decline**	NE	E-Decline	Exporter	Big Problem-1	Exporter
Miscellaneous manufactured articles	**NE**	NE	E-Decline	NE	Big Problem-1	E-Shrink
SITC06/TIME	**July 08**	**Aug. 08**	**Sep. 08**	**Oct. 08**	**Nov. 08**	**Dec. 08**

Food and live animals	**I-Decline**	**Big Problem-2**	**I-Decline**	**Importer**	**NI**	**NI**
Beverages and tobacco	**NE**	Big Problem-1	Exporter	E-Decline	Big Problem-1	Big Problem-1
Crude materials, inedible, except fuels	**I-Decline**	Big Problem-2	Importer	NI	Big Problem-2	I-Decline
Mineral fuels, lubricants and related materials	**E-Decline**	NE	NE	Big Problem-1	Big Problem-1	Big Problem-1
Animal and vegetable oils, fats and waxes	**NE**	E-Decline	NE	E-Decline	Big Problem-1	NE
Chemicals and related products, n.e.s.	**Big Problem-1**	Big Problem-1	E-Decline	NE	Big Problem-1	NE
Manufactured goods classified chiefly by material	**E-Shrink**	Big Problem-1	E-Shrink	NE	Big Problem-1	NE
Machinery and transport equipment	**NE**	Big Problem-1	Exporter	E-Decline	Big Problem-1	E-Decline
Miscellaneous manufactured articles	**Exporter**	Big Problem-1	E-Decline	Exporter	Big Problem-1	E-Decline
	Jan. 09	**Feb. 09**	**Mar.09**	**Apr. 09**	**May.09**	**June 09**
Food and live animals	**Big Problem-2**	**I-Declining**	**Importer**	**Big Problem-2**	**NI**	**I-Decline**
Beverages and tobacco	**E-Decline**	NE	E-Shrink	NE	NE	E-Shrink
Crude materials, inedible, except fuels	**Big Problem-2**	Big Problem-2	NI	Big Problem-2	Big Problem-2	I-Decline
Mineral fuels, lubricants and related materials	**Big Problem-1**	Exporter	NE	NE	NE	NE
Animal and vegetable oils, fats and waxes	**E-Decline**	Exporter	NE	E-Decline	NE	E-Decline
Chemicals and related products, n.e.s.	**Big Problem-1**	Exporter	E-Shrink	NE	Big Problem-1	Exporter
Manufactured goods classified chiefly by material	**E-Decline**	NE	E-Shrink	Big Problem-1	NE	Big Problem-1
Machinery and transport equipment	**Big Problem-1**	Exporter	E-Decline	Big Problem-1	E-Decline	NE
Miscellaneous manufactured articles	**Big Problem-1**	Exporter	E-Decline	NE	NE	Exporter

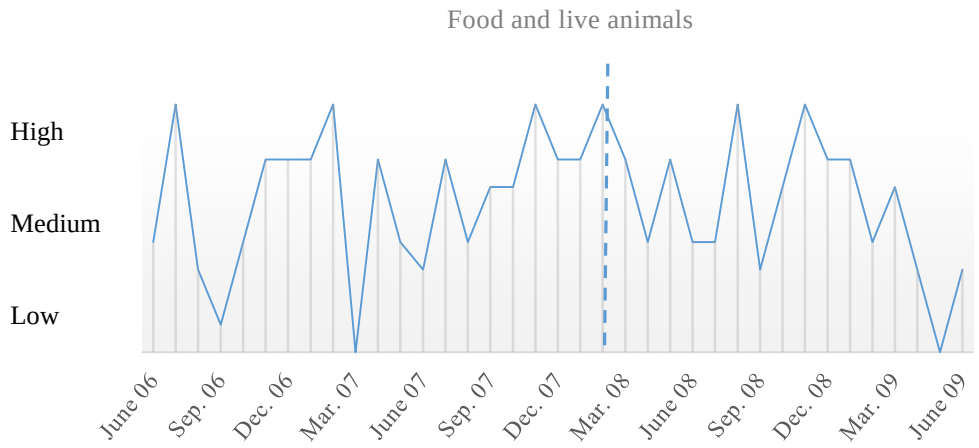


Figure 4. EU Food and Live Animals Sector

Food and live animals industry started as a Big Problem-1 region in July 2006 to Importer region in January 2008 and placed its position I-Decline region at the end which shows us a decreasing trend in high adjustment problems to medium levels within the industry. The high volatile profile of adjustment costs within industry seems to decrease at the end of the crisis. According to GL Index, IIT levels within the industry have shown improvement in our sample period regardless the existence of financial turmoil.

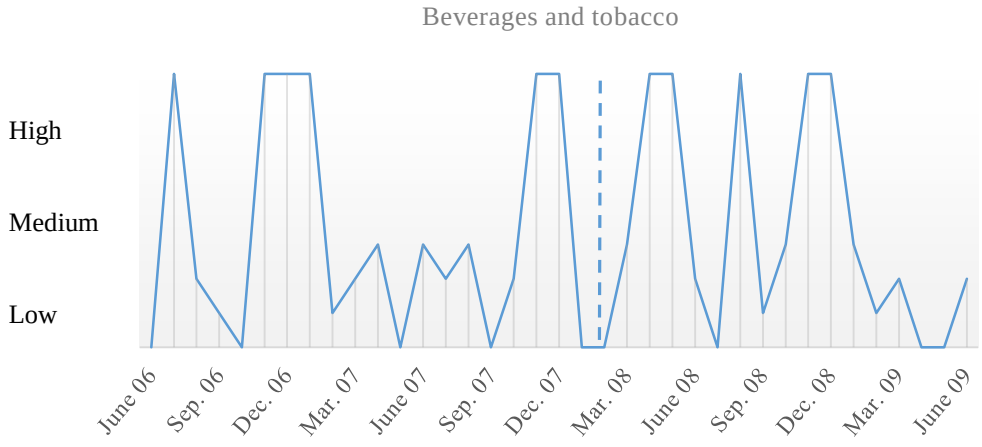


Figure 5. EU Beverages and Tobacco Sector

Beverages and tobacco industry has been also faced high adjustment costs in July 2006. Although the volume of exported EU goods exceeded imported

goods from NAFTA countries, total trade volume was diminishing in that period. In a crisis, since January 2009, industry stabilized its adjustment costs. Throughout the three years period, including the financial crisis, at it holds a position in E-Shrink region as in the export-surplus region, r_x, which is a sign of adjustment costs are not expected at all.

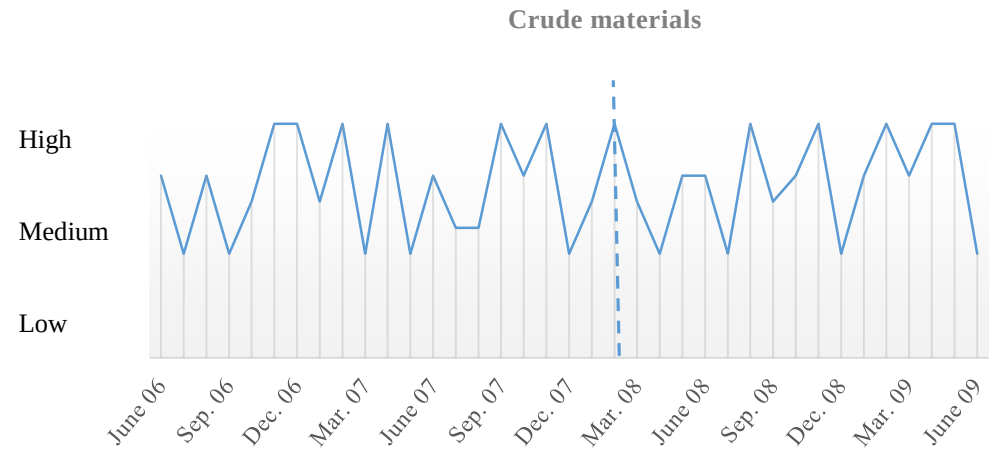


Figure 6. EU Crude Materials Sector

Crude materials industry sector (except fuels) has different aspects rather than every other industry sector in our research. Fundamentally, EU industries are bounded with NAFTA industries by importing raw materials or semi-finished goods for producing final goods. Trade relation such that positions EU firms in import heavy situation against their North American rival firms in this sector. Our results also showed that these firms found themselves in medium-to-high adjustment costs in labor market due to this dependency. Crude materials sector experienced substantial adjustment costs in all sampling period reckon without crisis or not.

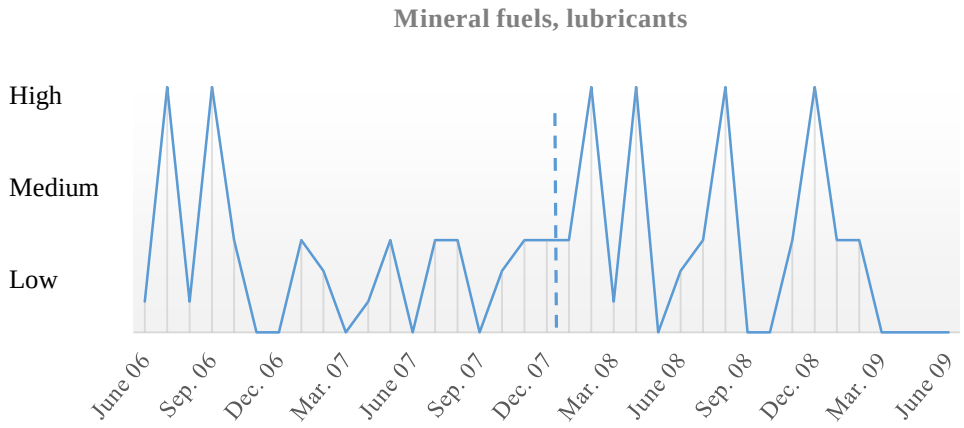


Figure 7. EU Mineral Fuels and Lubricants Sector

Mineral fuels, lubricants, and related materials industry experienced two consecutive periods with high adjustment costs before the crisis started. Almost a year (2007) sector balanced adjustment costs for factor reallocation purposes. However, the sector has suffered from high adjustment costs just like at the end half of 2006 after the crisis started. This sector eventually overcomes negative impacts of financial crisis upon trade relations with NAFTA counterparts and placed itself NE region which shows us there are no adjustment problems within the industry at the official end date of crisis.

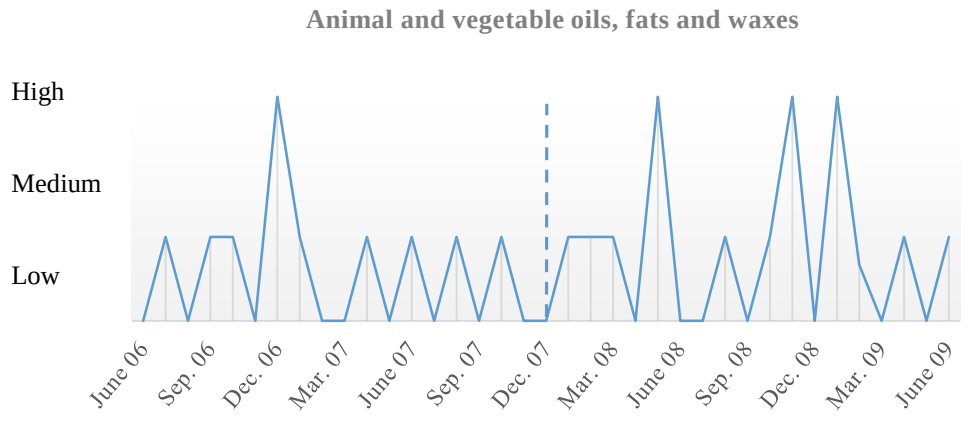


Figure 8. EU Animal and Vegetable Oils, Fats and Waxes Sector

Animal and vegetable oils, fats and waxes have stabilized performance before crisis except for three month period around December 2006. But instantaneous break of crisis changed its situation by dragging this industry sector into the more volatile ground. Three crucial periods length eight months harmed sector by increasing adjustment costs. Altogether, at the sector hold its position at E-Decline which shows us there are no adjustment problems within the industry in June 2009.

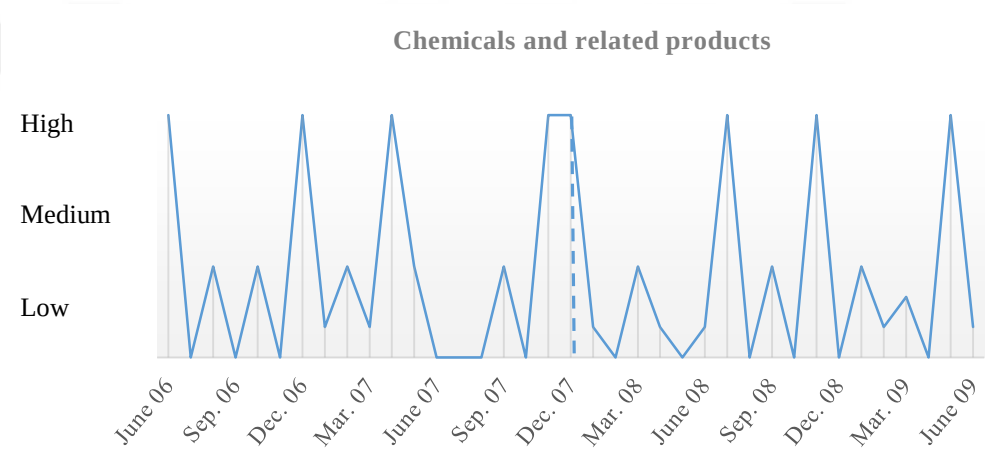


Figure 9. EU Chemicals and Related Products Sector

Although chemicals were experienced too many volatile trends in crisis-era without holding two consecutive periods, could achieve to maintain its position in Exporter region which shows us there is none expected adjustment problems within the industry at the end of June 2009.

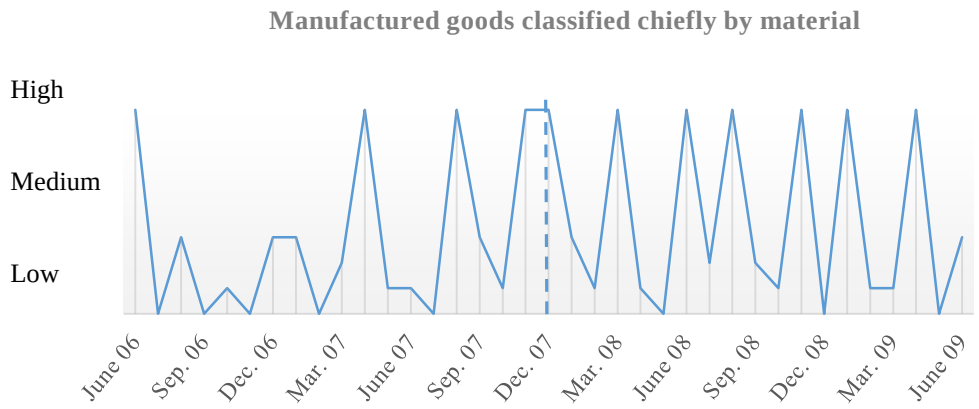


Figure 10. EU Manufactured Goods Classified Chiefly by Material Sector

Manufactured goods sector dominates almost 8% of exported EU goods to NAFTA countries in the market. The sector was greatly suffered from the financial crisis and its complications while having numerous peaks at adjustment costs. Practically, all developments in crisis had affected sector and escalated the costs to the maximum level. Sector positioned itself from NE region to Big Problem-1 region having diminishing total trade volumes within itself.

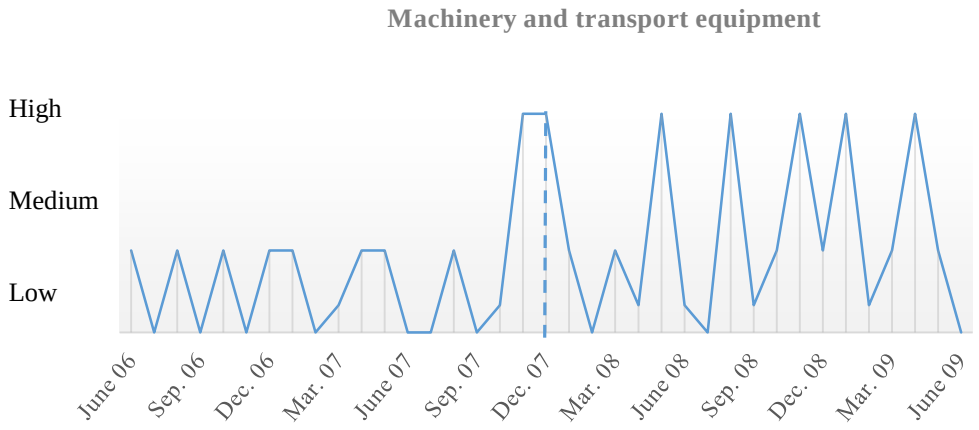


Figure 11. EU Machinery and Transport Equipment Sector

Machinery and transport equipment sector had the same problem of volatile trends like manufactured goods. Actually, sector holds 42.51% of total trade with NAFTA countries creates a unique situation. The sector has suffered most from fluctuations in the financial crisis than any other industry sector and EU labor market experienced highest adjustment costs in replacing labors in this sector from one EU firm to another. Although sector holds its situation in r_x region (NE) at the end, it struggled with decreasing total trade volume with eleven months in the overall crisis period.

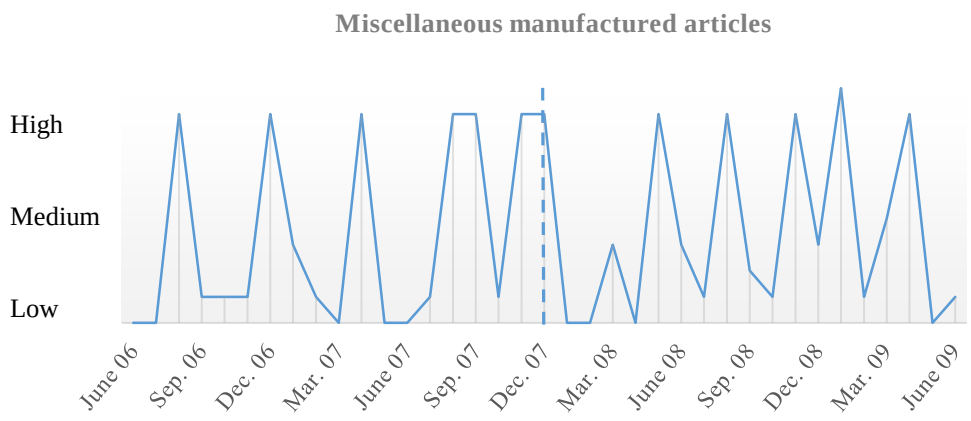


Figure 12. EU Miscellaneous Manufactured Articles Sector

Last industry sector, miscellaneous manufactured articles were affected by the crisis like other manufactured product industries. It has lots of spikes during the financial crisis but at the end, it holds trade performance within r_x region by NE to Exporter with none expected adjustment costs at all.

4.1 Modified Competitiveness Matrix Results

During financial turmoil in the US, EU industries have been deeply affected by its impacts on European labor market Europe continent, domestic and foreign competitiveness levels of their trade operations in overseas NAFTA

market. Analyzing each industry individually presents our whole picture of bilateral trade performance between two continents in that era.

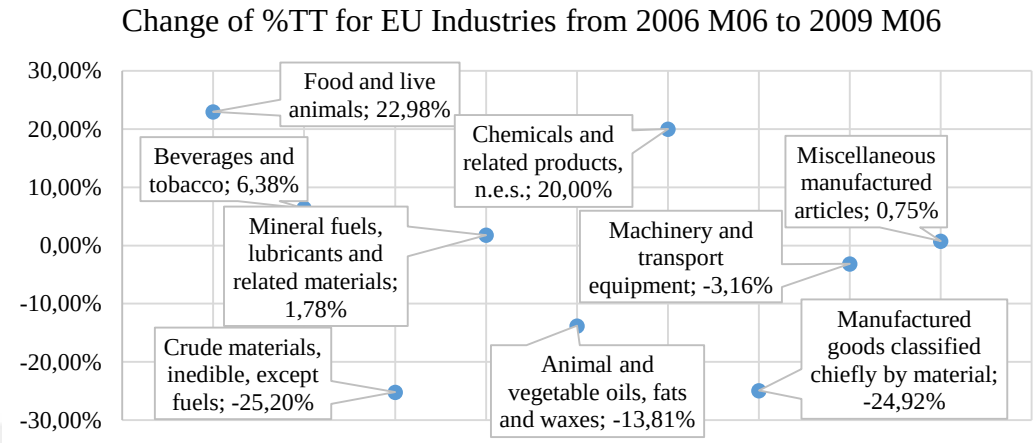


Figure 13. Change of Total Trade Percentage of EU Industries

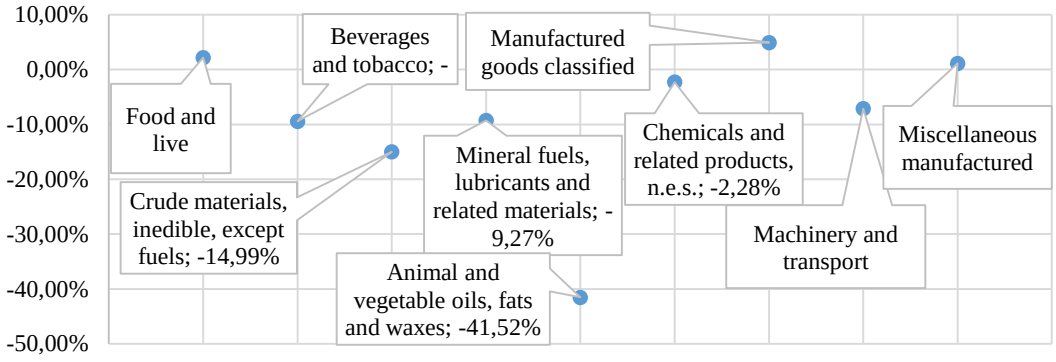


Figure 14. Change of Unit Value Index of EU Industries

Figure 4.1.1 includes export, import, and percentage of domestic industry trade performance in all industries total trade amount (Δperc. TT). Figure 4.1.2 presents the change in its product value (ΔUVI) over 36 month time period. Industries are categorized under our matrix restrictions by changes in both Δperc. TT and ΔUVI. For simplification purposes of results, the analysis is

grouped under 1-digit SITC industry sectors. Δperc. TT reveals the percentage change of an industry's total trade among other industries as an internal competitiveness indicator. ΔUVI shows us the percentage change of the unit value of a produced well in that certain industry as an external competitiveness indicator.

The first category in Table 2 contains only miscellaneous manufactured articles (SITC 9) as a *Rising Star* industry. This EU industry increased its share in ΔTT_2 by 6.64% while having a decline before the crisis (ΔTT_1 as -5.52%) against other fellow domestic EU industries and at 1.14% rate it improved overall product quality. In other words, miscellaneous manufactured articles with 12.65% share of total trade performed best suitable scenario; increased its TT among other industries and global competitiveness level of its products raised in financial crisis time period.

Declining Star category of the matrix includes five other industry sectors (SITC-2, 4, 5, 6 and 8). Although these five industries increased their market share in bilateral trade flow with NAFTA got upper hand in domestic competition, they began to lose ground in the foreign level of competitiveness against other industries via losing ground in product quality. In quantitative perspective, machinery and transport equipment sector (SITC 8) increased its total trade amount while having higher TT market percentage (42.51%) than the combination of other four industries within the same category, also having least decline in its overall product quality in crisis era. Animal and vegetable oil industry has experienced substantial improvement in its market share, however, it performed hugely lost its unit value by -41.52% against its NAFTA competitor industries. Nevertheless, its TT percentage is just 0.21% in whole

EU industries exported goods market, so the substantial decline in UVI should not harm EU labor market in a disastrous way.

But in terms of numbers, machinery and transport with chemicals with almost 65% of total EU exports to Northern America must be remarkable decline. These two foremost industries in bilateral trade relation with NAFTA will create further turbulences for EU labor market due to any decline in existence competitiveness situation in their sectors. In addition to that, chain reaction as a cumulative impact may drag other EU industries to a frantic position with high adjustment cost problems.

Missed Opportunities section includes two industries; food and live animals (STIC 1) and manufactured goods classified by chiefly material (STIC 7). Both of these industries have faced a decline in market sizes while improving their product qualities. Food and live and live animals have lost its increasing trend in gaining domestic market share among exported EU goods (47.41% to -16.57%). But a change in manufactured goods classified chiefly by the material is more significant because it affects 7.64% share of the total trade of EU exported goods. In July 2006 it generated almost 11% of exported goods but at the end of financial crises, this percentage was diminished to 7.6%. Such an unfavorable change is reasoned by losing domestic competitiveness level of industry. This outcome will create high adjustment costs for firms within the sector.

Last category *Retreats* consists of only one industry with experiencing worst-case scenario in crisis. Crude materials (SITC 3) lost its market share on TT in EU-28 while UVI of their products melts away against NAFTA industries

products. The industry had lost its competition performance in both domestic and foreign markets. Potentially in a crisis era, it faced adjustment problems due to losing competition struggle against its rivals. According to SAH, a firm or industry sector is started to suffer from adjustment costs when it could not maintain its ambition toward monopolistic competition. Our results have shown that crude materials industry experienced worst percentage decline in TT and UVI. The main reason behind this outcome is EU industries in this sector position themselves in predominantly import region against their competitors in NAFTA.

Table 3. Trade Competitiveness Matrix Results

Matrix Region / SITC	%TT in all EU Industries			2006 July - 2008 Jan.	2008 Jan. - 2009 July	2006 July - 2009 July
	2006 July	2008 January	2009 July	ΔTT_1	ΔTT_2	ΔUVI
Rising Star	**$\Delta TT_2 > \Delta TT_1$, ΔUVI > 0**					
9 Miscellaneous manufactured articles	12,55%	11,86%	12,65%	-5,52%	6,64%	1,14%
Declining Star	**$\Delta TT_2 > \Delta TT_1$, ΔUVI < 0**					
2 Beverages and tobacco	1,96%	1,56%	2,08%	-20,44%	33,72%	-9,43%
4 Mineral fuels, lubricants and related materials	7,40%	7,23%	7,53%	-2,32%	4,20%	-9,27%
5 Animal and vegetable oils, fats and waxes	0,24%	0,16%	0,21%	-34,19%	30,98%	-41,52%
6 Chemicals and related products, n.e.s.	19,07%	19,87%	22,89%	4,20%	15,17%	-2,28%
8 Machinery and transport equipment	43,90%	42,34%	42,51%	-3,55%	0,40%	-7,11%
Missed Opportunities	**$\Delta TT_2 < \Delta TT_1$, ΔUVI > 0**					
1 Food and live animals	2,02%	2,98%	2,49%	47,41%	-16,57%	2,18%
7 Manufactured goods classified chiefly by material	10,17%	10,11%	7,64%	-0,58%	-24,49%	4,92%
Retreats	**$\Delta TT_2 < \Delta TT_1$, ΔUVI < 0**					
3 Crude materials, inedible, except fuels	2,68%	3,89%	2,01%	44,85%	-48,36%	-14,99%

5. Combined Results for Policy Implications

Strategic over the map for policymakers can be built on our research with the capability of diminishing adjustment costs via increasing trade potential and focusing on improvements in competitiveness levels of industry sectors. Extraordinary times like financial turmoil do need specific roadmaps. Policymakers who are intended to decrease adjustment costs in labor market will be benefited from this paper.

Results show that financial crisis has a negative impact on total trade volume and position most of EU industries into Big Problem regions. Also, adjustment costs in crisis period are more volatile with increasing tendency at higher amounts. Except for manufactured goods chiefly by materials industry sector, almost all industries stabilized their situations for factor reallocation purposes. Due to results, EU policymakers should improve the export capacity of domestic industries in food and live animals, crude materials, and manufactured goods chiefly by materials. Furthermore, policymakers must reduce addiction of EU crude materials sector to NAFTA raw materials for avoiding further imbalances in this sector.

Our matrix contains paramount importance at competitiveness perspective for measuring performances of industries in both before crisis period and during the crisis period. Only miscellaneous manufactured products performed great performance during crisis period both increasing its total share and unit value index, however rest of EU exported goods (87% of all traded goods) experienced significant fundamental problems. 76% percent of industry sectors have positioned themselves in declining star region while suffering from

decreasing product quality against their NAFTA opponents. Animal and vegetable oil industry lost more or less 40% of its product quality value and step back in foreign competition in the global market. Policymakers should overcome this development by promoting products in this sector to surpass negative effects of the crisis on this sector. Finally, our matrix has shown that it is a valuable tool for getting sound results in measuring adjustment costs by capturing vital situation of crude materials sector just like industry trade box. Both total trade share and unit value index have been decayed in crisis time period for this sector. Policymakers should take this sector's struggle into consideration when design an optimal trade policy to lower adjustment costs with increasing its total share and product quality.

6. Conclusion

In this paper, we gather our data from bilateral trade data between EU and NAFTA from July 2006 to July 2009 in Eurostat database. SAH is examined to find a connection between adjustment costs in labor market and IIT, GL index is used for a measurement of adjustment costs within sectors and trade competitiveness matrix is implemented as a subsidiary tool for evaluating competitiveness levels of industries to monopolistic competition in the financial crisis. Industry trade box proved it's worthiness by providing the visual concept with both historical and economic background of EU in trading with NAFTA. We used a wide range of monthly-driven data on STIC level of industries to capture a big picture for providing foresight and a strategic over map for policymakers.

In financial turmoil period, industries are struggled with high resource reallocation costs, decreasing the availability of professional labor for within their sector, diminishing trend in total trade volume and declining consumption rates toward their products in both domestic and foreign markets. So, embedded strategies shall overcome these catastrophic issues by measuring the functionality of each industry in respect to their trade performance.

Governments must pursue to foster trade reforms and even subsidies for export-oriented sectors to lower harmful effects of job losses in labor market. Moreover, integrated economic regions such EU and NAFTA have to implement combined policies by common consent with their all members to overcome negative effects of diminishing trade volume. Specific international trade policies on each industry sector dissolve uncertainties.

Our results on economic unions are available for further research in different perspectives. Recessions, economic setbacks and financial crises in other time periods should be next objective for scholars by using our combined methodology to capture vital points for industry sectors. Next, the particular area would be dynamic measurement methods in spatial economics for illustrating adjustment problems under different IIT indexes.

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Chapter 2. Labor Market Adjustment in Developing Countries: A Perspective of Marginal Intra-Industry Trade

ABSTRACT

The developing nations report the highest share of intra-industry trade in the bilateral trade balance with the developed part of the world. This research aims to capture dynamic changes in the magnitude of trade patterns of industry sectors in 25 developing countries with 34 developed country and compare its adjustment costs pattern. Evaluating dynamic IIT patterns in both factor reallocation costs (FRC) and factor price rigidity (FPR) levels is our main approach for understanding the link between trade liberalization and adjustment costs. The bilateral trade of similar products has a significant association with product differentiation, industrial agglomeration, and the eventually negative relationship between the economics of scale and labor intensity. We applied dual indices to capture crucial breakdowns of developing countries in the path of trade liberalization. The marginal quality index (MQ Index) as a new measurement tool for obtaining changes of quality in traded products that accompanies dynamic features of IIT. Our results have robust features due to analyzing specific patterns of an ongoing free trade policies in developing countries with respect to identifying industries as contracting, neutral and expanding via trade liberalization process.

Jel No. F19, F16, R3

Keywords: International economics, trade and labor market interactions, new economic geography

1. INTRODUCTION

Economic geography intends to deepen our understanding of economic transactions and improve our simplifications over unpredicted outcomes of industrial agglomeration. A useful simplification provides a suitable environment for us to overcome restrictions caused by the complexity of multiple economic transactions at once. After all, designating a knowledge might be possible on tremendous datasets.

Since 1980s globalization process has led to change nation's production policies and create solid long-term trade partnerships, especially intensified trade relations is increased between developing and developed regions of the world. Several countries had switched their industrialization processes from import substitution (contracting) to export orientation (expanding), which would be easier to manage adjustment costs is similar trade commodities for relative factor intensities for both exports and imports. Existing long-standing trade partnerships allow nations hold adjustment pressures under control and ease to reallocate factors of production via industry sectors more smoothly.

In consideration of adjustment pressures, intra-industry trade (IIT) is accepted a general implement in literature. IIT can be described as statistical artifact along with several arguments about IIT is the mainstream trade flow for concentrated industry clusters named as categorical aggregation. Leamer argued that IIT as a miraculous empirical finding that seems to have had a crucial impact on international trade (Leamer, 1994). Almost two-decade research since then accumulated around this phenomenon. As a result, refinement of imperfect

competition models in international economics has been implemented in so-called new economic geography (NEG).

However, in the international economics literature, adjustment costs have been processed since the foundation of European Economic Community (EEC). In the 1960s, the era of combining European countries under basic regional trade agreements along with widening free trade approach transforms countries shape in patterns upon an important question: “What will happen to reallocation costs with domestic industry sectors after incorporating with foreign countries?” In theory, labor market experiences increased factor reallocation costs (FRC) in transitional periods. For instance, short-term temporary unemployment level is increased due to limited mobility of labors between different industries.

Eventually, concerns are raised from high-level adjustment costs and created its own literature. In 1966, Balassa was argued adjustment pressures arising from trade liberalization will depend on the structure of IIT (Balassa, 1966). A higher share of IIT is accompanied by relatively low adjustment costs which are the main idea of Smooth Adjustment Hypothesis (SAH). Remarkably, SAH has known as a topic that “hard to find evidence” until recent decades. However, increasing the availability of labor market and trade integration data, we are able to survey rigorous empirical analysis on SAH.

Numerous studies found a strong relationship between highly developed country’s labor market adjustment costs and their focus on IIT levels within domestic industries. These former studies should be less illustrative for developing countries with different trade and production endowments. Analyzing developing countries as a whole, a geographically dispersed local

production facilities leads to greater factor requirement amounts which end up with severely higher adjustment problems of production factors.

This paper is structured as follows. Section 2 presents the broad analysis of MIIT literature. In section 3, MIIT measures are discussed and applied in newly formed Trade Concentration Space via describing MIIT features for developing countries. Section 4 provides our results over a graphical resolution that we presented in the former section. The evolution of Turkish industries from 1996 to 2015 is discussed in the same section. Section 5 concludes our study with a brief summary.

2. LITERATURE REVIEW

New economic geography has established over the foundations of the neoclassical economic theory. Neoclassical economic theory in the concept of space in economic geography based on two main assumptions. First, there are no economies of scale and world is a homogenous place for production purposes. Due to these assumptions, industrial agglomeration should be dispersed all around the world to cut off transportation costs. In that point of view, Isard also argues that "[…] everything in the economy is in effect compressed to a point, and all spatial resistance disappears." (Isard, 1949).

Following years, these neoclassical assumptions were relaxed in reason to analyze the term of space in a meaningful manner. Researchers tried to extend theoretical background for marginal IIT in an explicitly general equilibrium environment (Lovely and Nelson, 2002). Applying a general equilibrium aspects is crucial because marginal IIT is essential to answer a fundamental question: "How labor force is directed towards national trade policies?"

Literature of IIT come into prominence with the discourse of both concepts; trade liberalization and it's adjustment to international trade. Empirical importance of IIT is emphasized since the beginning of economic integration process of European Economic Community (today European Union) by Verdoorn (1960). Moreover, in Balassa's model (Balassa, 1966), empirical literature found the particular mathematical foundation on IIT aspects. Balassa indicates that IIT has lower adjustment costs rather than inter-industry trade. He argued that an unnecessary demise of particular industries in EEC members should not lead them into overestimation of adjustment pressures that raised from free trade. In contrary, especially in preferential liberalization, several studies present a strong connection between liberalization and growth in IIT percentage on overall trade balance (Kojima, 1964, Grubel, 1967). Menon also reached similar results for the case study of Australia – New Zealand in results for free trade approach and growth in IIT after took effect of Closer Economic Relations Pact (Menon, 1994). [8]

Pagoulatos and Sorenson (1975), Caves (1981) present several assumptions to consider impacts of trade barriers and barrier similarities between trade partner countries to examine trade liberalization induces IIT. According to their findings, trade barriers are negatively and barrier similarity positively correlated with IIT percentage in transitional economies. Lovely and Nelson indicate the apparent connection between IIT and trade liberalization as "Causation of low adjustment costs run from IIT to trade liberalization. Adjustment to IIT is less costly than an adjustment to inter-industry trade to the claim that countries

[8] Honorable mentions are also Loertscher and Wolter (1980), Balassa and Bauwens (1987), Globerman and Dean (1990) that provide useful understandings in literature.

negotiating liberalization will be predisposed to agree to liberalize sectors characterized by significant IIT via a straightforward political economy argument" (Lovely and Nelson, 2002).

Reciprocal concessions are cement for these negotiations over freer trade environments. The prominence of this connection between IIT and trade liberalization is broadly accepted and studied since GATT negotiations. Hufbauer and Chilas (1974) suggested that in detail; GATT negotiations favor intra-industry over inter-industry specialization in terms of adjustment pressures. In addition to that, in regional trade agreements, it is easier to accept for both trading parties lowering trade barriers for some industry sectors.

A year later from GATT negotiations, well-known static measurement index of IIT, Grubel-Lloyd (1975) presented their index is used for measuring adjustment costs on trade groups for multi-country framework,

$$GL = \frac{(\mathrm{Xi}+\mathrm{Mi})-|\mathrm{Xi}-\mathrm{Mi}|}{(\mathrm{Xi}+\mathrm{Mi})} \quad (1)$$

where X_i and M_i stand for export and import levels for trade partner i. Range from 0 to 1, closer values to '1' it shows IIT percentage dominance over total trade volume while '0' shows inter-industry trade accumulation. GL index is used to IIT type measurement method for obtaining Industry Trade Box (ITB) on trade groups for multi-country framework capture crucial points on adjustment cost problems.

2.1. Marginal Intra-Industry Trade

However, equation 1 cannot reveal fundamental information on adjustment costs. Caves (1981), Hamilton and Kniest (1991) argued that a

researcher should focus on not the change in IIT percentage, but whether the percentage of IIT in overall trade balance after trade liberalization policies. In the light of this implication, a researcher has to define the determinants of changes in both IIT and net trade (NT), then emphasize changing features of trading on adjustment problems. Therefore, a necessity for measurement was raised of marginal IIT in economic geography literature as a dynamic measurement implication.

Finger and DeRosa (1979) presented an industry-specific framework about impacts of several trade barriers on human capital inputs in use of IIT-based production. Their study reveals the inverse proportion of human capital usage and IIT for during the existence of high-level trade barriers. Trade barriers is a crucial point because developed and industrialized countries have a common tendency to protect labor forces and maintain control protocols for their exporting successful industries.

On the other hand, developing countries are also being protective of their industry sectors with export success. An observable increase in exports will limit the increasing imports and it's endangered to domestic products in the same industry (Nelson, 1990; Ray, 1991). In other words, IIT has a strong and positive correlation with the removal of trade protections. A very first study of a dynamic IIT is a survey of Lundberg and Hansson (1986) in 1986 to examine the curious case of Sweden. Sweden’s industrial transition period from 1959 to 1972 is examined it that study while testing hypothesis of the possible correlation between IIT and trade liberalization does exist. Although they found a weak link between protective industrial measures and IIT at starting the year 1959 or found a positive and significant relation at the end year 1972, they revealed a much

more important result. A positive correlation between IIT level of 1972 and steadily removal of trade barriers from 1959 to 1972. This study is the first that anticipated evidence of dynamic features on IIT in favor of lessened adjustment pressures rather than inter-industry trade is introduced in their preliminary study.

A decade later, crucial deficiencies of past researchers with static approaches over IIT debates have been criticized on the bulk of empirical frameworks in literature. A most notable evaluation was proposed by Greenaway, Hine, Milner, and Elliot (1994) that identifies the assumptions of MIIT. That framework sets a path for two similar but fundamentally different measures for MIIT, one for Menon and Dixon indices (UMCIT Index) and another for Brilhart's indices (A Index, B Index, C measure).

When a spatial economist tries to express its findings, classification of those findings should be accepted as norms which may surely evolve in time. Although, time is a variable that we cannot be certain of its alterations. Due to the bindings on time concept, we frequently use longer time periods in our research.

This paper established its framework to analyze the dataset for testing both industry-specific and country-specific determinants of MIIT predicted by two different indices. Research on industry-specific attributes reveals nature of domestic market structure for developing countries with product variety and economies of scale while a study on country-specific aspects provides us to focus empirical findings on such as factor endowments and income levels between trade partners.

We follow recent literature in measuring industry-specific determinants of marginal IIT while holding country-specific features under control. The role of IIT process in developing parts of the world, especially countries with the economic transition and emerging markets is our main concern in this paper. It would make easier us to comment on the connection between developing-developed parts of the world and their industry sectors. We used 34 developed countries as trade partners as fixed country-pair effects to distinguish trade partner specific effects. In other words, country pair dummies are used to explain marginal IIT rather than relative factor endowments. A significant positive correlation is found between MIIT and both net trade changes and product quality differentiation, industrial agglomeration, and economics of scale.

3. METHODOLOGY

3.1. S Index & MQ Index

In different regions of the world, the emergence of transitional economies as developing countries in the 1980s with accelerated trade liberalization process, a stimulus of intra-industry literature has established. In this paper, we examine the determinants of adjustment costs during 1995 to 2015 time period for 25 developing countries but for simplification purposes, we only present Turkey as a case study. These countries provide a resourceful opportunity for us to gather important points in understanding the relationship between IIT and adjustment costs. Due to removing their trade barriers, changing their approved production methods, improving domestic market structures and starting to channel capital and technology flows from developed

part of the world, these specific developing countries are examined for exploring different industry-specific features on marginal IIT.

Several alternative indices have been suggested for as capturing changes in IIT, as mentioned before, by time periods as marginal IIT. Hamilton and Kniest (1991), Brülhart (1994), Menon and Dixon (1997) offered different indices to improve understanding of the linkage between IIT and adjustment costs. Until the recent day, a more general methodology has composed over four pillars of new economic geography as main assumptions. In other words, encompassing to verify dynamic features of IIT share in total trade can be measured by examining those four assumptions. First, monotonicity assumption measures bilateral trade actions that show us the greater sectorial disparity creates greater market disruption and so in our study, adjustment costs should be measured by an expanding function of net trade change in bilateral trade actions.

Secondly, the consistency assumption identifies the inverse relation between bilateral trade partners might be monitored with unmatched changes between them on factor reallocation requirements. In other words, an industry expansion in a single country will cause an industry contraction with associated trade partner countries. Therefore, a setback of a developing country's high-tech or capital-abundant industry sectors might be understood as an expansion of its trade partners with a comparative advantage in those specific industries.

Thirdly, the specification of a country or industry should be monitored cautiously. According to the country-specific assumption, S index provides useful material us to recognize if a country is expanding in specific industries or contracting those industries and abandon trade actions in favor of imported goods rather than domestically produced goods. Besides the change in overall

net trade share, the quality level of domestically produced goods has got at least equal importance with quantitative features of these goods. MQ index is applied to measure those quality levels for domestically produced goods and provides fundamental information for the dynamic background of IIT.

Finally, in similar industries, firms have identical factor requirements to match foreign competition. Despite this situation, any increase or decrease will be resulted in changing industry's total demand. However, with regard to identical factor requirements assumptions, SAH assumes that total demand for resources is unaffected and there is no need for resource reallocation is required in cases of IIT dominates the majority of total trade. In addition, SAH states that increased IIT share in total trade is associated with less severe adjustment pressures rather than trade changes were an inter-industry pattern. Especially, sectorial oriented imports and exports can be contained and conducted by resource transfers within similar industries.

On the other hand, inter-industry changes the trend of resource reallocation from contracting (import heavy substitution) industries. Furthermore, adjustment implications are become more severe due to the greater the factor requirement differences between geographically dispersed industries.

On the product quality side, changes in IIT and inter-industry percentage in total trade involves higher adjustment pressures than standing trade flows in terms of factor reallocation issues (Brülhart and Elliot, 2002). As a reason, labor-abundant industries within a low-quality product have higher adjustment pressures while competing in international markets rather than capital-abundant industries with high capital products. The labor requirements in these two different type industries naturally carry different possible adjustment costs.

Industries with low-tier quality products experience higher retraining costs to undertake such a labor reallocation or fails to employ unemployed labors in economic recession periods.

Actually, we applied SAH as a formal theoretical model for investigation of dynamic IIT towards labor market adjustment. SAH locates IIT in a center with production factors cause minimal disruption in the same industry sector. Labor changes within same industries will be minimalized in order to IIT holds the majority of bilateral trade actions. In respect to SAH, Brülhart (2000) argued that an only possible hypothesis with an inversely proportional relationship between marginal intra-industry trade (MIIT) and changes in employment amount in overall Turkish industries has been analyzed in this paper.

3.2 Trade Concentration Space

Convergence of developing countries should be considered as their transition period of integrating with rest of the world since the end of the 1980s. Ambiguous conclusions of this transition reveal itself in factor adjustment costs and create additional evidence of MIIT can be measured by bilateral trade data sources. Azhar and Elliot (2006) offered their visualization approach with a brief review of disentangling IIT as vertical and horizontal IIT. The main reason for their study is to overcome proportionality effect in old-school models of Greenaway, Hine, and Milner (GHM) and Fontagne and Freudenberg (FF).

Proportionality effect may increase from scaling asymmetric impacts on marginal values of both imported and exported products. Analysis of adjustment costs to trade liberalization may be miscalculated via those asymmetric features. To hinder this problem, Azhar and Elliot (2006) suggest their visualized solution, namely as Product Quality Space (PQS) with using static GL Index to

dispose of VIIT and HIIT. PQS is quite successful to dealing with proportionality effects in developed parts of the world but providing a useful framework for developing countries, we added unit quality values which are crucial for products are produced within developing countries with their developed countries counterparts. In other words, products from developing countries have to compete against their foreign counterparts via only qualitative aspects rather quantitative. The long-term but only solution for developing country's industry sectors is to pace up with the developed world via achieving higher unit quality values in their domestically produced goods.

This paper focused on changes in FRC and FPR in developing countries with bilateral trade transactions via developed countries as exploring factor adjustment costs. The latter, FPR, explains increasing prices of similar products of varied quality while former consists of an exchange of similar products that differentiated by quantity in terms of adjustment costs. Stating such a divergence is crucial as for capturing determinants of MIIT behavior. Therefore, we posit a model that presents geometric expressions for marginal IIT and factor adjustment costs. Disparities in factor prices as volatile consumer price indexes or basic inflation rates are studied in following 2-specific factor models; Brülhart (2000), Brülhart and Eliot (2002), Elliot and Lindley (2006), Brülhart et. al. (2006), Cabral and Silva (2006).

MIIT is measured by several indexes so far. But we applied S-Index of Azhar and Elliot (2003) in our research for evaluating dynamic aspects of MIIT. Despite having static approaches (such as GL index), dynamic indices provide information about not only the beginning and end period but also the volatile changes in during these interactions.

A two-dimensional evaluation process has been applied by us for creating several regions for identifying industry sectors in year by year trends. S index is used for obtaining factor reallocation costs (FRC) in labor market just after changing trade patterns in industry sector;

$$S = \frac{\Delta X - \Delta M}{2[\max\{I\Delta XI, I\Delta MI\}]} \quad (2)$$

$$-1 \leq \text{S Index} \leq 1$$

Imported and exported goods of different quality are able to measure by quality based approach was developed for empirical purposes.[9] Marginal Quality (MQ) index is applied to capture changing pattern of product quality in international markets and is associated with the changes in MIIT percentages in overall trade. Shortly, the nature and severity of adjustment costs associated with product quality are measured in comparable trade changes. MQ index is selected as an interpretive tool for calculating FPR in industries by reshaping their labor force characteristics and quality of products that they produce;

$$MQ = \frac{\Delta UVIx - \Delta UVIm}{2[\max\{I\Delta UVIxI, I\Delta UVImI\}]} \quad (3)$$

$$-1 \leq \text{MQ Index} \leq 1$$

Where X and M represent export and import levels, UVI is unit value index with absolute values for Turkish industries, respectively. Both indexes range from "-1 to 1", closer values to '1' it shows MIIT percentage dominance over total trade volume while '-1' shows dynamically inter-industry trade concentration with

[9] A relation between product quality and paired IIT percentages is addressed as an important sequence in several notable studies such as Brülhart (1994), Menon and Dixon (1997), Azhar and Elliot (2003).

higher adjustment costs. The combination of S and MQ indices are measured for MIIT type measurement method for obtaining Trade Concentration Space (TCS) on trade groups for the multi-country framework and capture crucial points on adjustment cost problems with factor price levels of exported and imported products within the domestic country.

3.3. Graphical Resolution

Policymakers have to plan their strategies on domestic industries (especially newly promoted) while having free trade or regional trade agreements with other trade partners of their country. Selection of three alternative choices has to build up a solid planning for them. They might choose to solidify export volumes or increase the overall quality of exported products, and even both of these choices at the same trade policy. Due to those choices, we had to employ a non-symmetric approach by identifying regions in Trade Concentration Space (TCS). Moreover, the results of dynamic IIT will provide necessary information for analyzing benefits and harmful effects of current trade policies to policymakers.

The main challenge in our suggestion with 2-specific factor model is to positioning two different indices in the same visualized graph. Both FCR and FPR have comprehensive and compelling theories at their foundations and find an answer to “How can we locate these dynamic changes in same visualization graph?”

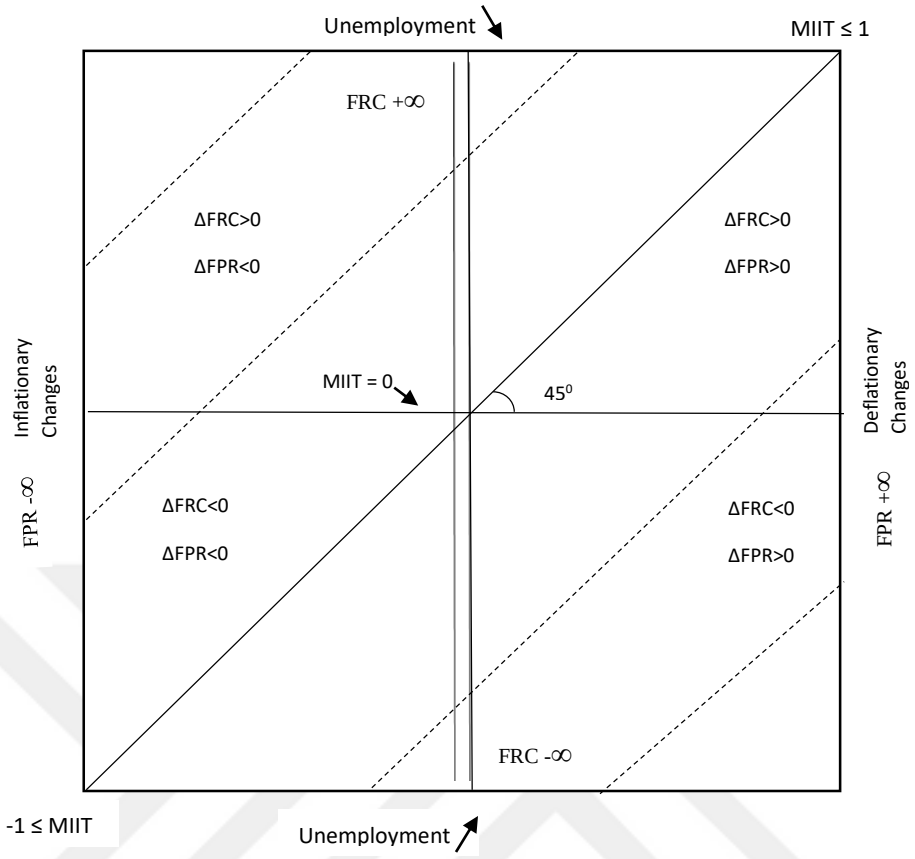

Figure 15. Visualized Graph of FRC and FPR.

ΔFRC and ΔFPR are a level of changes in production factor (labor force) and can be varied from (+) infinity to (-) infinity[10], however, we restrained their lower and upper limits for 1 and -1 for simplification purposes.

The combination of changes in net trade and product quality can be encapsulated in a coordinate plane whose dimensions are generated by two different indices. In our Trade Concentration Space (TCS), dimensions present maximum values of net trade changes and net quality changes for each industry for a country. Marginal changes in IIT levels positions each industry in different levels of adjustment costs. Adjustment cost structure is analyzed in terms of marginal net

[10] Capacity utilization level is determined by human capital of country and changes in labor market adjustment costs are restrained with maximum possible work force within the country.

trade and product quality changes in total trade. Then the dynamic changes of MIIT pattern in developing countries with their trade partners developed part of the world, will be revealed.

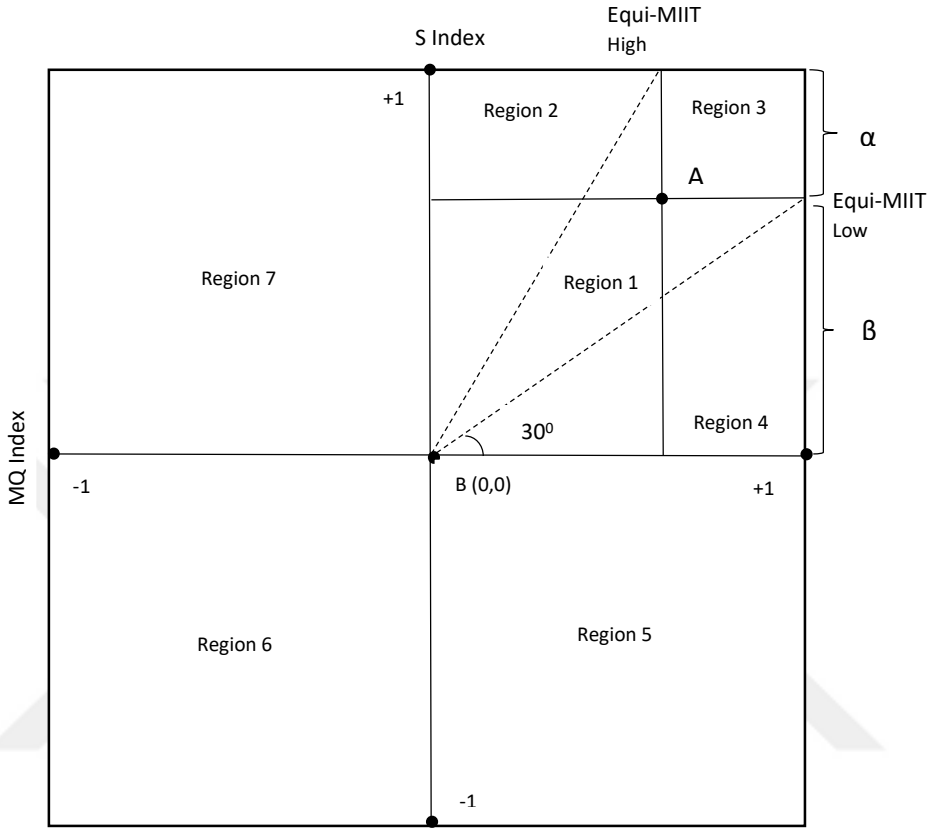

Figure 16. Two Dimensional Illustration of Trade Concentration Space (TCS)

Bilateral trade flows are conducted by national trade policies. Any policy will impact the direction of MIIT features for each specific industry. A dynamic coordinate plane-type TCS is introduced for us to capture crucial break-downs in a country's trade records. In the light of these MIIT changes, the upper right quarter of TCS consists of four regions with positive effects of trade liberalization on domestic industries. Positive impacts of freer trade are measured by two different Equi-MIIT lines and point A. An asymmetric approach is used in this evaluation because policymakers have to plan their strategies on domestic industries (especially newly promoted) while having free

trade or regional trade agreements with other trade partners of their country. Policymakers have several strategies to follow on promoting domestic industries. In TCS, they might promote net trade performance of domestic industries or net quality of exported goods against the quality of imported goods to compete with foreign firms in similar industries or even both of them for an industry. Due to those three different paths, we divided scope of Equi-MIIT lines by 30^o rather than ordinary 45^o line. Geometrically speaking, $30^o - 60^o - 90^o$ triangles with basic calculation ($\tan 30^0$) shows us;

$$\alpha = 0.4227 \text{ and } \beta = 0.5773$$

There are two main points in TCS rather than regional measurement. Point A stands for break-even point for creating a suitable environment for an industry, point B (origin point) identifies industries with non-trade relation with partner country or trade group. The comprehensive analysis considers various outcomes of MIIT on adjustment costs. In the analysis, the geometry of these lines of Equi-MIIT ($MITT_{high}$ and $MIIT_{low}$) features to distinguish sub-sectors of positive outcome area, region 1. We identified Equi-MIIT line close to S index as MIIT-high because the first priority of a developing country politician is to close trade deficit in existing industry and promote the export capacity of domestic products. On the other hand, increasing the quality levels of products is generally fall behind for short-term planned trade policies, so we identify the Equi-MIIT line close to MQ Index is MIIT-low.

Although region 1 consists of industries with positive outcomes of net trade changes and quality of products, their unstable and high volatile IIT trade records that may locate themselves in either TCS region in short-term time periods, especially less than five years. Region 2 and region 4 are similar regions

in basic, while policymakers focus on promoting both qualitative and quantitative features of domestic products against their foreign rivals, they neglect (even abandon) the other aspects of these exported goods. Region 2 favors increasing net trade balance for increasing economies of scale, while region 4 conducts creating domestic brands and improve the competitiveness of domestic firms in monopolistic competition in international markets.

The pinnacle of TCS is region 3 of course. This region bears only the most valuable domestic products in international markets. A developing country's only option to pace up with developed part of the world is to become protective over industries that existed in that region. The research and development investments may not be necessary for agricultural products in this region but manufacturing sectors have to be supported by these industries to pioneering rest of domestic industry sectors to improve their infrastructure and competitiveness.

Region 5 and region 7 includes domestic industries that beyond neglected by policymakers and those industries float under at least acceptable levels of one index. Region 5 suffers from net trade share of exported domestic products. Still, investments in research and development or several improvements in overall quality of produced goods are positive signs for the future expectations for these industries. On the other hand, basically, region 7 locates labor-abundant and middle or low-tech industries. The consecutively two time period industries of this region sacrifice their quality features to high capacity production. Agricultural products may be benefited from this production schedule but while production type is shifting toward 4^{th} industrial revolution,

domestic manufacturing sector sacrifices its' future market share for current production performance.

Remaining in region 6 is the worst scenario for a domestic industry. Produced goods of a country cannot compete with its foreign rivals in both quality and quantity. Either apparent consumption of domestic market tends to demand imported goods or production capacity of domestic producers cannot provide the necessary amount of products because of lack of infrastructure, technology or production methods. Adjustment costs are revealed at most in Region 6 and even worse a vicious cycle can be formed by letting those industries alone. Policymakers have to focus main issues of these industries to extinguish fundamental problems within those industries. Otherwise, those domestic industries will struggle with those structural problems rather than competing in the international market and become a hindrance to economic development in developing countries.

Our data includes 255 industry sectors for Turkey that accessed from UNCTAD database for structural analysis (3-digit ISIC Rev.3 classification) in terms of US dollar. 20 years' time period range in data is yearly admitted from 1995 to 2015 to focus on marginal IIT impacts on reallocation costs in each developing country's labor market.

4. RESULTS AND DISCUSSION

Since the accelerating process of trade liberalization in Turkey at the 1990s, dynamic IIT changes toward labor market adjustment costs have been started to gain significance. Via free trade approach Turkey has been stimulated into higher density trade formation with its trade counterparts. Willingly or

unwillingly, globalization trend seized international trade policies while macroeconomic policies that applied by national policymakers focused on creating trade surplus, decreasing unemployment levels and increasing product quality with diversity.

In figures 3.a to 3.e, the evaluation of Turkish industries in terms of MIIT by measuring both S and MQ index. After a year later of 1995 Dollar Crises in Turkey, the majority of domestic industries within country suffered net trade deficits against their foreign competitors. An unbalanced dispersion of industries presents us that only 35% (90 of 255 industry) industries were in desired regions of TCS while at least 50% industries found themselves in the worst region, region 6 with high adjustment pressures.

In 2000, the shifting from region 5 to region 7 is remarkable. Five years ago, the accumulated of 11.5% of whole Turkish industry sector shifted their position from quality-based production to increase their export capacity and started to abandon research and development investments in favor of daily basis trade operations. As a fact, annual results of 1996 and 2000 are black and white to each other but politically speaking, this shifting opened the path to 2002 Banking Crisis for Turkey by softening Turkish real market in terms of losing foreign exchange bringing capacity.

After 2002 Banking Crisis, a long-term IMF bail-out plans were applied in the Turkish economy. As a result, in 2005 (figure 3.c) industries have shown a recovery in bilateral trade records and lowered adjustment pressures in labor market. A balanced dispersion of industries with different characteristics proves us trade policies with targeting an improvement over product quality was carrying hope for the future of Turkish economy on those days. Even though, a

year later 2009 Bubble crises, industry sectors kept their export amounts but as we can see in figure 3.d, the trade performance of Turkish industries started to experience the same pattern in 2000, just before 2002 Banking Crisis. In other words, the real sector was at stake to take hit by 2009 Bubble crisis by decreasing foreign apparent consumption over Turkish exported goods. A trade and production policy targets quality based features over quantity based is a benefactor for future economic developments for Turkey.

The most recent result, 2015, is displayed in figure 3.e. As we mentioned before, not wrong but the lack of progressive approach in 2010, showed its harmful effects in MIIT indices. Turkish industries have already started to fall behind in foreign competition with increasing export capacity in their sectors. Increasing share of imported products in domestic demand trends, decreasing product capacity due to high factor costs for mass production started to entangle Turkish industry. However, different from experiences from 2000, Turkish industries preferred quality-based improvements in the production process but suffering under potential export capacity losses. The pinnacle of industries also lost their ground in region 3 and fall back into region 1 with diminishing in both fronts of net trade changes and product quality. FRC and FPR increased in all fronts and Turkish industry sectors became vulnerable to external effects such as global production rate decrease that happened in 2009.

Figure 17. MIIT Pattern of Turkish Industries in Five Year Periods

Two decades of political stirring over trade policies of Turkey is summarized in table 1 and table 2 by categorizing industries in five top industry sectors for losers and winners of these policies. Our analysis consists of measuring dual indices, S and MQ indices, and establishing TCS as a visual counterpart.

The following tables, Table 1 and 2 include the regional concentration of Turkish industries performance in FRC and FPR by combining S and MQ indexes in same measuring method. Asian concentration of industries is calculated by adding 10 developing country[11] index results (includes Turkey) in respect to Laspeyres formula. Industries are examined from 1996 to 2015 to capture crucial milestones in their bilateral trade records. Regional change column provides the starting and ending regions in TCS. S index results of Turkey and Asian countries measure FRC costs for production factor (labor forces) while MQ index reveals inflationary or deflationary trends in price levels of produced goods. In summary, categorization under such restrictions presents us to map Turkish industries trade pattern toward developed countries as its trade partners. In addition to that, for simplification purposes of results, our analysis is grouped under *the most damaged industries* and *the most benefited industries* with 3-digit SITC industry sectors.

Only ten industries are displayed in this results section for simplification purposes. In total, adjustment costs escalated in 90 industry (35.3%), stayed neutral in 80 industry (31.4%) and diminished in 85 industry (33.3%). Although the results are appeared as balanced distribution between total industries but the

[11] The regional development of concentration in Asia is measured by examining those countries in the same dataset: China, India, Indonesia, Jordan, Korea Rep., Malaysia, Pakistan, Singapore, Taiwan, and Turkey.

weighted average of Asia region and significance of these industries in daily consumption basis tell another story.

Table 4. Five Most Damaged Turkish Industries Comparing to Asian Industries

The Most Damaged Industries	**Regional Change**	**Turkey**		**Asia***		**Turkey**		**Asia**	
		S Index 1996	**S Index 2015**	**S Index 1996**	**S Index 2015**	**MQ Index 1996**	**MQ Index 2015**	**MQ Index 1996**	**MQ Index 2015**
[061] Sugar, molasses and honey	Region 3 to Region 6	0.76	-0.81	-0.23	-0.16	0.60	-0.31	-0.33	-0.04
[714] Engines & motors, non-electric; parts, n.e.s.	Region 3 to Region 6	0.81	-0.52	0.29	-0.10	0.60	-0.45	0.16	-0.20
[112] Alcoholic beverages	Region 3 to Region 7	0.61	0.96	-0.11	0.31	0.82	-0.26	-0.20	0.08
[025] Birds' eggs, and eggs' yolks; egg albumin	Region 4 to Region 6	0.54	0.38	0.10	0.12	0.80	-0.30	0.09	0.25
[037] Fish, aqua. invertebrates, prepared, preserved, n.e.s.	Region 4 to Region 6	0.53	-0.58	0.04	-0.02	0.84	-0.81	-0.01	-0.01

Source: UNCTAD 3-digit STIC classification, authors own calculation.
*: A weighted average of 10 Asian countries with respect to Laspeyres formula.

In table 4.1, the five most suffered industry sectors under adjustment pressure are presented. All five industries have been diminishing in bilateral trade actions since 1996 and having escalated increase in adjustment costs on both FRC and FPR. The de-industrialization process of sugar, honey, and engines with motor parts sector is a well-known issue in local but the facts didn't present such clearly as before. As a matter of fact, Turkey stepped back in both industries (061 and 714) but there is also a regional back down in the production of these goods against developed countries. We mean Turkey imported those products rather than producing and exporting to Western World. In addition to that, although Asia recorded an increasing net export amount in the sugar industry, the general quality couldn't achieve to reach developed country standards.

Privatization process of TEKEL[12] conduct sector of alcoholic beverages (112) into a path with increasing export volume but also losing ground with competing for foreign rivals.

Asian counterparts of Turkey also increased their net exports in the sector while improving their alcohol beverage brands position in international markets but according to domestic policies domestic producers started to feel adjustment pressures over brand management of their products. Still, this industry is the only one that floats over region 6 which means its' export volume capacity might be a key to rescue itself from adjustment pressures.

Agricultural sectors of bird eggs (025) with prepared and preserved fish (037) are also in the group of most damaged industries section. Net export amounts have been decreased since 1996 although Asian countries managed to hold their position in two-way trade with developed countries. In the quality-based evaluation, Turkish products lost their value in international markets while Asia region experienced development in MQ index for bird eggs and remained neutral in prepared and preserved fish.

[12] TEKEL was a Turkish alcoholic beverages and tobacco company. The company was nationalized in 1925 as a public company until it's' privatization process in the 21st century. A process from signing contraction of privatization of Tekel in 2004 and applied law obligations to vest private enterprises for starting to manage Tekel under name of MEY Company in 2008 is concerned in our study.

Table 5. Five Most Benefited Turkish Industries Comparing to Asian Industries

The Most Benefited Industries	**Regional Change**	**Turkey**		**Asia***		**Turkey**		**Asia**	
		S Index 1996	**S Index 2015**	**S Index 1996**	**S Index 2015**	**MQ Index 1996**	**MQ Index 2015**	**MQ Index 1996**	**MQ Index 2015**
[881] Photographic apparatus & equipment, n.e.s.	Region 6 to Region 3	-0.46	0.59	0.26	-0.04	-0.43	0.61	0.06	0.11
[633] Cork manufactures	Region 6 to Region 3	-0.50	0.66	-0.17	-0.21	-0.54	0.97	-0.34	-0.13
[571] Polymers of ethylene, in primary forms	Region 6 to Region 3	-0.66	0.61	0.28	-0.28	-0.40	0.75	0.14	-0.14
[245] Fuel wood (excluding wood waste) and wood charcoal	Region 6 to Region 3	-0.48	0.76	-0.02	-0.17	-0.47	0.71	-0.15	0.14
[036] Crustaceans, mollusks and aquatic invertebrates	Region 7 to Region 3	0.31	0.66	-0.35	-0.26	-0.09	0.58	-0.43	-0.22
Source: UNCTAD 3-digit STIC classification, authors own calculation. *: A weighted average of 10 Asian countries with respect to Laspeyres formula.									

During trade liberalization process in Turkey, domestic industries have been deeply affected by its impacts on new free trade policies as well as Asia continent, domestic and foreign competitiveness levels of Asian trade operations with developed countries varied. Analyzing each benefited industry individually presents our whole picture of true path MIIT performance for future implications.

Table 2 presents the five most benefited industries with increasing net trade performance and improving its product value over 20 year time period. Industries are categorized under our dual index restrictions.

Photographic equipment (881) sector experienced an increase in both export volume and product quality as the leading industry in this list. The crucial outcome is here while Asian countries had lost their export capacity, Turkey continued to overpower this regional regress and turned the situation for the own domestic industry. The Same scenario has also happened in cork manufacturing (633), Turkey expanded its market share trading with developed countries, Asia region stressed with decreasing export shares and tolerable quality improvements.

In spite of the fact that photographic equipment and cork manufacturing took the first two rows in our result list, the real winner is ethylene polymers industry sector (571). Even though both industries are useful frameworks for other domestic industries that target to monopolistic competition with foreign industries in international markets, domestic ethylene polymers industry surpassed Asian performance in similar products. They achieved to increase their products export capacity, quality and regional competitiveness in two decades. According to SAH, this experience is the perfect blossom for an industry.

Fuelwood and wood charcoal (245) industry recorded increasing net trade change and net quality change meanwhile Asian countries, especially China started to fall behind in exports of this sector. The main reason for this fall back is the escalating levels of energy that China necessarily demands its booming domestic industries. With specialization process over two decades, the quality of Asian and Turkish wood charcoal raised. The only industry recovered from region 7 in our list, crustaceans and mollusk (036) experienced both improvements in S and MQ index indicators but that increase might be

misleading because of regional improvement in Asia region. The share of this industry in total trade is also quite low, therefore, spillover effects of other foreign Asian industries or relocation of Western industries in Turkey might be the main reason behind that record.

In theory, almost every industry in a national economy is benefited from trade liberalization and freer trade policies with export-oriented production strategies. However, in the course of developing countries, trade liberalization is not a sole case of their individual attempts to increase their total trade share in international trade markets which is mainly dominated by developed countries. In other words, a developing country has to compete not only with developed countries but also other developing countries in same region or continent. Regional concentration is a deterministic aspect for those developing countries in the first generation of changing trade policies to freer trade approach. The shape-shifting of domestic industry trade trends have to be a long and enduring journey for these developing countries.

5. CONCLUSION

Descriptively, it is important to create a connection between adjustment pressures in labor market and bilateral trade actions in developing regions of the world. Once we have this benchmark of our study, we can apply this two-dimensional visualized trade space to analyze regional patterns of marginal IIT in future. Our comprehensive study presents the impacts of monopolistic competition trend in regional economics. Significant results over net trade balance and product quality improvements for a developing country are

examined in regards to regional facts and all *expanded*, *neutral* and *contracted industries* are presented in appendix A.

As we can clearly see in results, the MIIT record of Turkish industries has separated in almost equal percentages as one to the third ratio. However, contracting industries that losing ground in MIIT point of view consists of daily and significant products for the national economy. The contracting industry list includes infrastructure type products such as electrical equipment, sanitary and plumbing features, heating products and even live animals that affect a life of Turkish citizen in deeply and cripple his/her life standards in future. Renovating production types and applying necessary trade policy reforms are crucial for those industries in both labor force and apparent consumption levels. Policymakers should focus on MIIT records of these industries do not fall behind at least regional competition levels.

Competition struggles over developed markets for developing countries will not finish in a day of the matter. As we mentioned before, the journey of a developing country's pacing up with Western world is a marathon rather than a sprint. In addition to that, globalization and it brings along freer trade approach are not the scapegoat or main reasons behind contracting industries. Alteration of expanding industries reveals benefits of trade liberalization process and provide valuable lessons for policymakers to follow in contracting and infant industries.

Geographic proximity and crucially lower real wages should be implemented in further research's to explore the effect of different industry-specific features on IIT. Real wage levels are important for local economies in developing regions because as Tomlinson (2017) argues that stagnant income levels might be the

main reason behind crippling local labor forces. For further research, these topics should be examined in country-specific studies.

APPENDIX

Country List

Developed Countries	Continent	Developing Countries
Australia	Asia	China
Austria		India
Belgium		Indonesia
Canada		Jordan
Croatia		Korea Rep.
Czech Rep.		Malaysia
Denmark		Pakistan
Finland		Singapore
France		Taiwan
Germany		Turkey
Greece	Africa	Algeria
Hungary		Egypt
Iceland		Kenya
Ireland		Tunisia
Israel	N. America & S. America	Argentina
Italy		Brazil
Latvia		Chile
Lithuania		Colombia
Japan		Dominican Rep.
Luxembourg		Mexico
Malta		Panama
Netherlands		Paraguay
New Zealand		Peru
Norway		Uruguay
Poland		Venezuela
Romania		
Slovakia		
Slovenia		
Spain		
Sweden		
Switzerland		
UK		
US		

Table 6. S Index and MQ Index Results for Turkish and Asian Industries from 1996 to 2015

Industry/ Year		1996		Asia 1996		2000		Asia 2000		2005		Asia 2005		2010		Asia 2010		2015		Asia 2015	
Turkey vs. Asian Developing Countries	After Trade Liberalization	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index	S Index	MQ Index
[001] Live animals other than animals of division 03	Contracting	0,21	0,26	0,17	-0,06	-0,99	-0,64	-0,38	-0,39	-0,79	-0,58	0,04	-0,04	-0,54	-0,54	-0,19	-0,39	-0,51	-0,50	0,09	0,05
[011] Meat of bovine animals, fresh, chilled or frozen	Contracting	0,50	0,50	0,19	0,20	-0,55	-0,52	-0,22	-0,15	0,85	0,72	0,33	0,01	-0,50	-0,50	-0,29	-0,26	-0,48	-0,49	0,22	-0,17
[012] Other meat and edible meat offal	Neutral	-0,61	-0,52	-0,18	-0,26	-0,88	-0,63	-0,37	-0,27	-0,15	-0,01	-0,07	-0,36	0,80	0,66	-0,15	-0,06	-0,42	-0,40	0,18	-0,05
[016] Meat, edible meat offal, salted, dried; flours, meals	Neutral	-0,57	-0,64	0,07	-0,04	-0,63	-0,15	0,14	0,05	0,80	0,71	-0,12	0,11	0,00	0,83	0,03	0,05	-0,63	-1,00	0,30	-0,03
[017] Meat, edible meat offal, prepared, preserved, n.e.s.	Contracting	0,44	0,55	0,23	0,08	-0,45	-0,31	-0,13	0,14	0,96	0,67	0,30	-0,01	0,47	0,52	0,30	0,22	-0,49	-0,54	-0,13	-0,19
[022] Milk, cream and milk products (excluding butter, cheese)	Neutral	-0,66	-0,33	-0,09	-0,12	0,53	0,51	-0,19	-0,03	0,56	0,63	-0,13	0,30	0,41	0,89	-0,23	-0,21	-0,50	-0,56	0,29	0,33
[023] Butter and other fats and oils derived from milk	Contracting	0,65	0,58	0,15	0,01	0,67	0,91	-0,19	0,01	0,11	0,19	-0,15	-0,24	-0,44	-0,42	-0,32	-0,13	0,54	0,58	0,30	0,05
[024] Cheese and curd	Contracting	0,33	0,70	0,08	0,01	-0,66	-0,98	-0,08	-0,23	0,54	0,98	-0,36	-0,07	0,39	0,75	-0,17	-0,04	0,69	0,38	0,14	-0,07
[025] Birds' eggs, and eggs' yolks; egg albumin	Contracting	0,54	0,80	0,10	0,09	-0,49	-0,43	-0,07	0,17	0,43	0,63	-0,14	-0,02	0,44	0,41	0,16	0,07	-0,38	-0,30	0,12	0,29
[034] Fish, fresh (live or dead), chilled or frozen	Neutral	0,13	0,03	0,15	-0,12	-0,66	-0,47	-0,12	0,01	0,42	0,52	-0,05	0,40	-0,64	-0,46	-0,03	-0,20	0,31	0,20	0,07	0,13
[035] Fish, dried, salted or in brine; smoked fish	Neutral	-0,24	-0,74	0,06	-0,18	0,99	0,73	0,07	0,46	0,51	0,53	-0,17	-0,07	0,35	0,25	0,13	-0,16	-0,39	-0,41	-0,08	-0,08
[036] Crustaceans, mollusks and aquatic invertebrates	Expanding	0,31	-0,09	-0,35	-0,43	-0,71	-0,56	-0,41	0,11	-0,35	-0,64	0,00	-0,36	-0,77	-0,50	0,07	-0,13	0,66	0,58	-0,26	-0,22

[037] Fish, aqua. invertebrates, prepared, preserved, n.e.s.	Contracting	0,53	0,84	0,04	-0,01	0,45	-0,39	0,05	0,02	0,51	0,52	0,03	-0,03	0,50	-0,36	0,23	-0,13	-0,58	-0,81	-0,02	-0,01
[041] Wheat (including spelt) and meslin, unmilled	Neutral	-0,75	-0,94	-0,01	-0,03	0,08	0,10	0,39	-0,12	0,94	0,90	-0,27	0,29	0,46	0,66	-0,11	0,01	-0,81	-0,56	0,20	0,15
[042] Rice	Neutral	0,54	0,52	0,07	0,04	-0,66	0,47	0,00	-0,22	-0,48	-0,49	0,09	0,13	-0,47	-0,48	0,01	-0,16	0,49	0,49	0,03	0,03
[043] Barley, unmilled	Neutral	-0,52	-0,51	-0,24	-0,22	-0,45	-0,44	-0,09	-0,09	0,43	0,42	-0,31	0,01	0,54	0,62	0,01	0,11	-0,89	-0,58	-0,39	-0,31
[044] Maize (not including sweet corn), unmilled	Neutral	-0,46	-0,43	0,05	-0,07	-0,56	0,12	-0,22	0,13	0,54	0,52	0,08	0,30	-0,77	-0,62	-0,22	-0,06	-0,87	-0,61	0,00	0,01
[045] Cereals, unmilled (excluding wheat, rice, barley, maize)	Neutral	0,32	0,34	0,12	0,12	-0,19	-0,13	-0,06	0,02	-0,53	-0,55	-0,11	-0,15	-0,76	-0,91	-0,01	-0,08	0,52	0,52	0,19	0,09
[046] Meal and flour of wheat and flour of meslin	Neutral	0,50	0,50	0,15	0,18	0,50	0,50	-0,32	0,31	0,50	0,50	-0,07	0,19	0,50	-0,50	0,34	0,08	0,50	0,50	0,00	0,16
[047] Other cereal meals and flour	Contracting	0,50	0,50	-0,02	-0,12	-0,29	-0,29	-0,02	0,03	0,11	-0,16	0,22	0,23	0,16	-0,07	0,14	0,13	-0,50	-0,50	0,10	0,22
[048] Cereal preparations, flour of fruits or vegetables	Contracting	0,48	0,48	0,20	-0,06	0,67	0,93	-0,07	0,17	0,44	-0,70	-0,02	0,35	0,34	0,28	0,33	0,15	-0,48	-0,37	0,17	0,05
[054] Vegetables	Contracting	0,50	0,51	-0,05	-0,29	-0,21	-0,31	-0,31	-0,12	0,40	0,12	-0,14	0,42	0,10	-0,93	0,01	-0,42	-0,81	-0,41	-0,22	0,02
[056] Vegetables, roots, tubers, prepared, preserved, n.e.s.	Contracting	0,50	0,51	-0,14	-0,30	-0,49	-0,48	-0,23	-0,12	0,49	-0,50	0,00	-0,02	-0,59	-0,53	0,12	0,10	-0,59	-0,92	-0,29	-0,32
[057] Fruits and nuts (excluding oil nuts), fresh or dried	Expanding	-0,65	-0,50	0,06	-0,04	-0,51	-0,50	-0,23	-0,20	0,50	0,51	-0,12	0,11	0,46	0,88	0,13	0,07	0,42	0,37	0,08	0,00
[058] Fruit, preserved, and fruit preparations (no juice)	Expanding	0,49	-0,45	-0,01	-0,08	-0,52	-0,51	-0,18	-0,14	0,48	0,48	0,19	0,22	0,48	0,51	0,13	-0,11	0,48	0,47	0,03	0,10
[059] Fruit and vegetable juices, unfermented, no spirit	Contracting	0,53	0,55	0,22	0,20	-0,51	-0,50	0,18	0,29	0,47	0,46	-0,07	0,04	0,46	0,45	0,25	0,05	-0,50	-0,28	0,13	0,30
[061] Sugar, molasses and honey	Contracting	0,76	0,60	-0,23	-0,33	0,50	0,51	-0,13	0,07	-0,54	-0,49	-0,19	-0,07	0,46	0,53	0,01	-0,07	-0,81	-0,31	-0,16	0,03
[062] Sugar confectionery	Contracting	0,48	0,48	-0,12	-0,25	-0,48	-0,39	-0,08	-0,09	0,46	0,32	0,09	0,30	0,61	-0,14	0,51	0,14	-0,50	-0,59	-0,19	0,06
[071] Coffee and coffee substitutes	Contracting	0,56	0,55	0,03	-0,23	0,31	0,45	-0,29	0,22	0,69	0,52	0,24	0,21	-0,24	0,61	-0,03	-0,11	-0,56	-0,59	-0,24	-0,35
[072] Cocoa	Contracting	0,09	0,27	0,21	0,09	0,62	0,82	-0,18	-0,17	-0,24	-0,22	0,03	0,18	-0,09	0,01	-0,09	-0,36	-0,12	-0,40	-0,25	-0,14

[073] Chocolate, food preparations with cocoa, n.e.s.	Contracting	0,31	0,23	0,24	0,02	-0,06	0,42	-0,13	-0,19	0,51	0,70	-0,07	0,12	0,37	0,44	0,14	0,26	-0,47	-0,64	-0,01	-0,03
[074] Tea and mate	Expanding	0,51	0,52	0,24	0,00	-0,70	-0,55	-0,03	-0,03	0,23	0,06	-0,18	0,05	-0,25	-0,18	0,23	-0,05	0,91	0,66	0,04	0,22
[075] Spices	Expanding	-0,50	-0,50	0,10	-0,11	-0,19	-0,54	-0,16	-0,10	-0,61	-0,50	-0,26	-0,13	0,43	-0,48	0,33	-0,03	-0,58	0,19	0,12	0,39
[081] Feeding stuff for animals (no unmilled cereals)	Expanding	-0,50	-0,52	-0,09	-0,23	0,43	0,46	0,16	-0,11	-0,11	0,79	0,32	-0,13	-0,92	0,36	0,07	0,19	0,41	0,43	-0,15	-0,18
[091] Margarine and shortening	Expanding	0,50	0,50	-0,03	-0,09	0,50	0,50	-0,15	0,26	0,50	0,51	-0,08	-0,12	-0,75	-0,48	-0,02	0,04	0,77	0,68	-0,03	0,10
[098] Edible products and preparations, n.e.s.	Neutral	-0,25	-0,25	0,12	0,02	0,57	0,87	-0,20	0,40	0,15	-0,17	-0,17	0,20	0,31	0,21	0,20	0,17	-0,46	-0,82	0,15	0,15
[111] Non-alcoholic beverages, n.e.s.	Neutral	0,49	0,50	-0,01	-0,07	0,45	0,88	0,07	0,12	0,89	0,14	-0,21	0,29	0,10	0,07	0,19	0,08	0,52	0,18	0,11	0,11
[112] Alcoholic beverages	Contracting	0,61	0,82	-0,11	-0,20	-0,77	0,28	-0,26	-0,01	-0,68	-0,73	0,23	-0,11	0,30	0,38	-0,17	-0,02	0,96	-0,26	0,31	0,08
[121] Tobacco, unmanufactured; tobacco refuse	Contracting	0,36	0,40	0,13	0,04	-0,63	-0,54	0,39	-0,27	0,17	-0,92	0,06	0,23	-0,45	-0,38	0,07	0,13	-0,58	-0,73	0,11	0,09
[122] Tobacco, manufactured	Expanding	-0,39	-0,25	-0,15	-0,02	-0,83	-0,24	-0,02	0,17	-0,31	-0,35	0,20	0,02	-0,92	-0,59	0,14	-0,19	0,41	0,56	0,36	0,46
[211] Hides and skins (except fur skins), raw	Expanding	-0,51	-0,71	0,02	0,06	-0,51	-0,51	0,04	0,06	0,51	0,50	0,15	0,23	-0,50	-0,51	-0,14	-0,21	0,48	0,49	0,16	0,17
[212] Fur skins, raw, other than hides & skins of group 211	Expanding	-0,47	-0,44	-0,39	-0,34	0,60	0,53	0,05	-0,11	-0,25	0,55	0,01	-0,09	-0,50	-0,50	0,03	-0,02	0,51	0,51	0,11	-0,01
[222] Oil seeds and oleaginous fruits (excluding flour)	Expanding	-0,35	0,26	-0,48	-0,41	-0,74	0,42	-0,31	-0,07	-0,46	-0,48	0,33	-0,05	0,67	0,53	0,09	0,38	0,37	0,37	0,39	0,31
[223] Oil seeds & oleaginous fruits (incl. flour, n.e.s.)	Contracting	0,45	0,45	-0,13	-0,22	-0,59	-0,55	0,02	-0,08	-0,58	-0,66	-0,17	-0,19	0,34	-0,06	0,11	0,08	-0,74	-0,90	0,20	0,08
[231] Natural rubber & similar gums, in primary forms	Neutral	0,05	0,34	-0,04	-0,06	0,47	0,60	-0,20	-0,01	0,46	0,45	0,05	0,31	0,41	0,91	0,23	0,22	0,22	0,11	0,10	0,17
[232] Synthetic rubber	Expanding	-0,54	0,24	-0,11	-0,18	-0,49	0,49	-0,19	-0,07	-0,60	-0,87	0,12	-0,19	-0,42	-0,36	-0,05	0,00	0,42	0,36	0,13	0,16
[245] Fuel wood (excluding wood waste) and wood charcoal	Expanding	-0,48	-0,47	-0,02	-0,15	-0,49	-0,49	-0,15	-0,08	-0,52	-0,52	-0,11	0,10	-0,50	-0,50	-0,04	-0,38	0,76	0,71	-0,17	0,14
[246] Wood in chips or particles and wood waste	Neutral	-0,75	-0,72	-0,32	-0,35	0,32	0,34	-0,06	0,18	0,52	0,51	-0,27	-0,04	-0,46	0,53	-0,03	0,12	-0,51	-0,51	-0,36	-0,27
[247] Wood in the rough or roughly squared	Neutral	0,52	0,50	0,10	-0,02	-0,50	0,37	-0,11	0,12	-0,33	0,58	-0,25	-0,22	-0,50	-0,50	-0,07	-0,04	0,49	0,49	-0,04	0,10

[248] Wood simply worked, and railway sleepers of wood	Expanding	-0,36	-0,29	-0,13	-0,17	0,53	0,85	-0,21	0,12	0,56	0,28	-0,05	0,14	-0,46	-0,98	-0,23	-0,48	0,50	0,97	0,16	0,40
[251] Pulp and waste paper	Contracting	0,47	0,48	0,07	0,02	-0,49	-0,47	-0,32	-0,26	-0,49	-0,49	0,21	-0,10	-0,46	-0,44	-0,16	0,06	-0,47	-0,49	0,09	0,06
[261] Silk	Expanding	-0,38	-0,46	-0,05	-0,07	0,76	0,67	-0,22	0,08	0,16	0,19	-0,17	0,05	0,47	0,60	0,21	0,08	0,48	0,47	0,28	0,32
[263] Cotton	Neutral	0,42	0,58	0,31	0,31	-0,68	-0,83	0,16	0,06	-0,89	-0,45	0,13	-0,21	-0,46	-0,47	0,02	0,11	0,46	0,48	0,25	0,31
[265] Vegetable textile fibres, not spun; waste of them	Contracting	0,49	0,49	0,08	0,15	0,46	0,47	-0,19	0,10	0,48	0,48	0,13	0,01	-0,47	-0,48	0,01	0,02	-0,31	-0,44	0,02	0,00
[266] Synthetic fibres suitable for spinning	Neutral	-0,42	-0,32	0,09	-0,04	0,37	0,67	-0,19	0,21	0,38	0,27	0,15	0,15	0,47	0,58	0,24	0,16	-0,37	-0,82	-0,23	-0,26
[267] Other man-made fibres suitable for spinning	Contracting	-0,13	0,42	0,42	0,38	-0,40	0,84	-0,19	0,00	0,54	0,51	0,20	0,20	-0,46	0,51	0,00	0,21	0,66	-0,46	0,15	0,22
[268] Wool and other animal hair (incl. wool tops)	Contracting	0,69	0,57	0,22	0,15	-0,48	0,63	-0,04	-0,23	0,26	0,31	0,06	0,20	-0,25	0,48	0,05	0,29	0,29	0,37	-0,12	-0,02
[269] Worn clothing and other worn textile articles	Expanding	0,50	-0,30	-0,24	-0,24	-0,50	-0,54	-0,02	0,11	0,41	0,35	-0,31	0,22	0,39	0,42	0,17	-0,01	0,46	0,52	-0,05	-0,03
[272] Crude fertilizers (excluding those of division 56)	Contracting	-0,50	0,49	0,03	0,14	0,48	0,49	0,34	0,00	0,19	0,28	0,21	-0,05	0,05	0,50	0,05	0,13	-0,29	-0,42	0,07	-0,05
[273] Stone, sand and gravel	Neutral	-0,28	-0,79	-0,04	-0,29	0,51	0,55	0,17	0,21	0,52	0,62	-0,03	0,17	0,50	0,50	0,04	0,06	-0,50	-0,50	-0,12	-0,02
[274] Sulphur and unroasted iron pyrites	Neutral	-0,60	-0,55	-0,01	-0,05	-0,55	-0,58	0,01	-0,19	-0,51	-0,54	0,13	-0,14	-0,21	-0,23	-0,01	-0,15	-0,27	-0,37	0,29	0,16
[277] Natural abrasives, n.e.s. (incl. industri. diamonds)	Contracting	0,29	0,28	0,16	0,10	-0,67	0,00	0,05	-0,01	-0,19	-0,60	-0,01	0,35	0,49	0,61	0,07	0,01	-0,48	-0,83	-0,12	-0,23
[278] Other crude minerals	Contracting	0,31	-0,40	0,19	0,10	-0,49	-0,34	-0,05	0,18	0,45	0,47	0,11	0,07	0,45	0,49	0,12	0,16	-0,50	-0,66	-0,11	-0,23
[281] Iron ore and concentrates	Contracting	0,55	0,50	-0,17	-0,02	-0,49	-0,49	0,20	-0,15	-0,43	-0,39	0,21	-0,09	-0,38	-0,21	0,01	0,03	-0,13	-0,18	0,03	0,02
[282] Ferrous waste, scrape; remelting ingots, iron, steel	Neutral	0,48	0,49	-0,20	-0,16	-0,47	-0,44	0,03	-0,19	-0,52	-0,87	-0,16	-0,11	-0,48	-0,48	-0,01	0,10	0,48	0,48	0,30	0,39
[283] Copper ores and concentrates; copper mattes, cemen	Contracting	0,71	0,55	0,02	0,00	0,39	0,42	-0,03	0,33	-0,51	-0,50	0,17	0,04	0,50	0,50	0,03	-0,08	-0,50	-0,50	-0,03	-0,02
[284] Nickel ores & concentrates; nickel mattes, etc.	Neutral	-0,50	-0,50	-0,21	-0,31	0,51	0,51	0,13	-0,08	0,49	0,49	-0,08	0,16	0,50	0,50	0,16	0,23	-0,49	-0,48	-0,20	-0,20

[285] Aluminum ores and concentrates (incl. alumina)	Expanding	0,28	0,45	0,12	-0,04	0,56	0,75	-0,22	0,13	-0,70	-0,80	-0,36	-0,13	0,29	0,42	-0,17	-0,10	0,42	0,60	-0,07	-0,12
[286] Ores and concentrates of uranium or thorium	Neutral	0,50	0,50	0,00	0,00	0,00	0,00	-0,05	-0,20	0,00	0,00	-0,05	0,05	0,00	0,00	-0,12	-0,09	0,00	0,00	0,13	0,07
[287] Ores and concentrates of base metals, n.e.s.	Neutral	-0,71	-0,56	-0,18	-0,19	0,50	0,52	-0,07	0,23	0,48	0,48	-0,18	0,22	0,49	0,50	-0,11	-0,08	-0,50	-0,50	-0,29	-0,05
[288] Non-ferrous base metal waste and scrap, n.e.s.	Neutral	-0,81	-0,75	-0,27	-0,24	0,29	0,41	-0,04	0,29	-0,49	-0,55	0,03	-0,14	0,31	0,28	0,28	0,33	-0,56	-0,66	-0,29	-0,02
[289] Ores & concentrates of precious metals; waste, scrap	Contracting	0,50	0,50	0,25	0,20	0,60	-0,13	-0,25	0,20	0,52	-0,42	0,02	0,02	0,53	0,56	0,13	0,03	-0,50	-0,51	-0,17	-0,27
[291] Crude animal materials, n.e.s.	Neutral	-0,53	-0,46	0,11	-0,05	-0,70	-0,50	-0,51	0,14	-0,60	-0,76	-0,20	-0,10	-0,95	-0,33	-0,07	-0,21	-0,61	-0,82	-0,15	-0,04
[292] Crude vegetable materials, n.e.s.	Neutral	-0,42	-0,04	0,21	-0,12	-0,22	0,08	-0,09	-0,06	-0,51	-0,47	-0,04	-0,05	-0,18	0,47	0,36	-0,02	-0,12	-0,44	-0,14	-0,03
[321] Coal, whether or not pulverized, not agglomerated	Expanding	-0,50	0,50	-0,20	-0,08	-0,49	0,52	0,11	0,08	-0,49	-0,49	0,08	-0,05	-0,50	-0,49	-0,35	-0,35	0,50	0,50	0,17	0,08
[322] Briquettes, lignites and peat	Contracting	0,32	0,43	-0,25	-0,26	0,39	0,44	-0,08	-0,04	0,47	0,48	-0,04	-0,01	-0,50	-0,59	-0,25	-0,23	0,48	-0,49	-0,09	-0,13
[325] Coke & semi-cokes of coal, lign., peat; retort carbon	Expanding	-0,25	0,18	0,02	-0,01	0,20	0,36	0,05	0,17	-0,11	-0,08	0,09	-0,07	-0,51	-0,52	0,32	0,24	0,46	0,46	0,06	0,16
[333] Petroleum oils, oils from bitumin. materials, crude	Neutral	-0,58	-0,51	0,11	-0,04	0,50	0,50	-0,13	0,16	0,98	0,83	0,25	0,15	-0,50	-0,49	0,05	0,12	-0,48	-0,51	-0,33	-0,28
[334] Petroleum oils or bituminous minerals > 70 % oil	Expanding	-0,51	-0,74	0,24	0,23	-0,50	-0,53	0,19	0,30	-0,07	-0,18	0,11	0,29	0,22	0,84	0,38	0,43	0,42	0,45	-0,22	-0,10
[335] Residual petroleum products, n.e.s., related mater.	Expanding	-0,78	-0,29	-0,16	-0,30	-0,51	-0,54	-0,07	0,13	0,70	0,97	0,13	0,28	-0,41	-0,45	0,10	0,15	0,56	0,58	-0,02	0,10
[342] Liquefied propane and butane	Expanding	-0,63	-0,72	-0,08	-0,21	-0,50	-0,50	-0,05	0,18	0,19	0,33	-0,08	0,24	0,51	0,50	0,01	-0,12	0,51	0,51	-0,32	-0,38
[343] Natural gas, whether or not liquefied	Expanding	-0,50	-0,50	0,17	0,14	0,64	0,58	-0,18	0,05	0,50	0,50	-0,38	0,35	-0,58	-0,78	-0,04	-0,05	0,40	0,43	-0,13	-0,04
[344] Petroleum gases, other gaseous hydrocarbons, n.e.s.	Expanding	-0,68	-0,58	0,27	0,31	0,48	0,62	-0,12	0,43	0,49	0,49	0,03	0,23	0,52	0,61	0,25	0,03	0,47	0,45	-0,20	-0,09
[351] Electric current	Expanding	0,50	0,50	0,10	#SAYI/0!	0,50	0,50	#SAYI/0!	0,16	0,50	0,50	#SAYI/0!	0,26	0,50	0,50	0,10	-0,10	0,72	0,61	0,02	0,11
[411] Animals oils and fats	Expanding	-0,56	0,43	0,24	0,25	-0,05	0,25	-0,09	0,35	0,15	0,46	-0,08	0,14	-0,46	-0,43	-0,33	-0,21	0,54	0,54	0,28	0,23

[421] Fixed vegetable fats & oils, crude, refined, fractio.	Contracting	0,19	0,14	0,18	0,11	-0,38	-0,30	0,33	0,01	0,31	0,29	0,25	0,10	-0,27	-0,14	0,07	-0,03	-0,50	-0,54	-0,12	-0,16
[422] Fixed vegetable fats & oils, crude, refined, fract.	Neutral	-0,44	-0,43	-0,20	-0,19	-0,49	-0,48	-0,02	0,01	0,04	-0,02	-0,19	0,07	0,54	0,66	0,34	0,28	-0,30	-0,23	0,11	0,07
[431] Animal or veg. oils & fats, processed, n.e.s.; mixt.	Contracting	0,55	0,62	-0,07	-0,12	0,48	0,44	-0,21	-0,18	0,53	0,65	0,17	0,21	-0,61	-0,48	0,01	-0,07	0,51	0,48	-0,12	0,16
[511] Hydrocarbons, n.e.s., & halogenated, nitr. derivative	Expanding	-0,54	0,16	-0,03	-0,07	-0,38	-0,21	-0,13	0,02	-0,60	-0,80	0,03	0,29	-0,20	-0,10	0,28	0,32	0,20	0,17	-0,05	0,18
[512] Alcohols, phenols, halogenat., sulfonat., nitrat. der.	Expanding	-0,28	0,25	-0,24	-0,20	-0,61	0,05	0,14	0,06	-0,80	-0,65	0,27	0,37	-0,36	-0,33	0,25	0,14	0,54	0,57	-0,26	-0,26
[513] Carboxylic acids, anhydrides, halides, per.; derivati.	Neutral	0,47	0,46	0,14	0,21	-0,41	0,70	0,05	0,35	-0,54	0,41	0,09	0,24	-0,31	0,43	0,19	0,26	0,38	0,29	-0,10	0,08
[514] Nitrogen-function compounds	Neutral	0,34	0,45	0,19	0,01	-0,45	-0,29	-0,18	-0,29	-0,38	0,19	0,21	0,25	-0,44	0,78	-0,04	0,08	0,39	0,30	0,11	0,23
[515] Organo-inorganic, heterocycl. compounds, nucl. acids	Contracting	-0,43	0,49	0,10	0,07	-0,44	0,54	-0,16	-0,41	-0,90	0,41	0,23	0,10	0,48	0,54	-0,08	-0,04	0,42	-0,61	0,24	-0,09
[516] Other organic chemicals	Neutral	0,05	0,45	0,29	0,16	-0,22	0,67	-0,28	0,00	-0,30	0,89	0,12	0,08	-0,31	-0,05	0,00	0,23	0,50	0,54	-0,05	-0,09
[522] Inorganic chemical elements, oxides & halogen salts	Expanding	-0,54	-0,26	0,27	0,33	0,42	0,45	-0,23	-0,02	0,17	0,32	0,21	0,40	0,30	0,49	0,21	0,29	0,05	-0,59	0,05	0,04
[523] Metallic salts & peroxysalts, of inorganic acids	Neutral	-0,95	-0,45	-0,16	-0,20	-0,31	-0,17	0,00	-0,04	-0,01	-0,47	0,24	0,04	0,46	0,58	0,11	-0,11	-0,31	-0,24	-0,15	0,02
[524] Other inorganic chemicals	Neutral	-0,96	-0,53	-0,34	-0,33	-0,28	0,26	-0,04	-0,11	0,35	0,34	-0,17	-0,10	-0,03	0,10	-0,29	-0,35	-0,18	-0,57	0,22	0,26
[525] Radio-actives and associated materials	Neutral	-0,46	-0,37	0,00	-0,09	-0,43	0,10	-0,07	-0,07	0,59	0,55	0,29	0,14	0,67	0,85	-0,28	-0,23	-0,14	-0,60	-0,06	-0,14
[531] Synth. organic coloring matter & coloring lakes	Expanding	-0,51	0,48	0,28	-0,01	0,60	0,52	-0,20	0,51	0,52	0,49	0,14	0,29	-0,12	0,55	-0,04	0,04	0,36	0,32	0,17	0,04
[532] Dyeing & tanning extracts, synth. tanning materials	Expanding	-0,42	-0,49	0,08	-0,03	-0,23	0,31	0,04	0,10	0,53	0,81	0,03	0,48	0,22	0,37	-0,07	-0,06	0,50	0,87	0,25	0,41

[533] Pigments, paints, varnishes and related materials	Contracting	-0,28	0,61	0,03	0,00	-0,63	0,41	-0,46	-0,03	-0,29	0,88	0,15	0,14	-0,31	0,54	-0,05	-0,14	0,24	-0,80	0,31	0,08
[541] Medicinal and pharmaceutical products, excluding 542	Contracting	-0,39	0,50	-0,14	-0,04	0,95	0,54	0,05	0,19	-0,50	0,39	0,31	-0,13	0,78	0,51	-0,03	0,08	0,33	-0,28	0,06	-0,10
[542] Medicaments (incl. veterinary medicaments)	Contracting	-0,38	0,60	-0,18	-0,14	-0,43	0,61	-0,22	-0,32	-0,03	0,61	0,24	0,01	0,22	0,52	0,02	0,38	0,29	-0,52	0,00	-0,18
[551] Essential oils, perfume & flavor materials	Contracting	0,76	0,48	0,35	0,13	0,54	0,51	-0,27	0,04	-0,47	0,29	0,07	0,23	-0,42	0,52	-0,10	0,05	0,43	-0,51	0,04	-0,21
[553] Perfumery, cosmetics or toilet prepar. (excluding soaps)	Contracting	-0,04	0,35	-0,07	-0,09	-0,05	0,79	-0,27	0,05	-0,37	-0,65	0,28	-0,13	-0,17	0,58	-0,13	-0,08	0,28	-0,70	0,14	-0,03
[554] Soaps, cleansing and polishing preparations	Contracting	0,43	0,50	0,20	-0,04	-0,66	-0,17	-0,45	-0,18	-0,12	-0,45	0,20	0,22	0,08	0,24	0,01	-0,18	-0,25	-0,48	-0,15	0,16
[562] Fertilizers (other than those of group 272)	Contracting	0,23	0,34	0,09	0,04	-0,59	-0,89	0,04	0,30	-0,57	-0,65	0,09	-0,06	0,42	0,94	0,13	0,16	-0,46	-0,81	-0,24	-0,39
[571] Polymers of ethylene, in primary forms	Expanding	-0,66	-0,40	0,28	0,14	-0,46	-0,21	-0,51	0,04	-0,41	-0,35	-0,16	0,06	-0,40	0,73	0,31	0,34	0,61	0,75	-0,28	-0,14
[572] Polymers of styrene, in primary forms	Expanding	-0,33	0,40	0,14	0,07	-0,50	-0,49	-0,58	0,23	-0,50	0,49	-0,01	0,23	-0,51	-0,81	0,29	0,30	0,40	0,32	-0,37	-0,30
[573] Polymers of vinyl chloride or halogenated olefins	Expanding	-0,81	-0,16	0,12	0,08	-0,49	-0,47	-0,22	0,05	-0,40	0,57	-0,01	0,40	-0,50	-0,51	-0,30	-0,37	0,49	0,49	-0,13	-0,07
[574] Polyether, epoxide resins; polycarbonate, polyesters	Expanding	-0,38	0,63	0,04	-0,05	-0,86	0,25	-0,29	0,22	-0,59	-0,79	0,00	0,36	-0,15	0,54	0,20	0,18	0,48	0,47	-0,20	-0,18
[575] Other plastics, in primary forms	Expanding	-0,51	-0,80	-0,21	-0,24	-0,48	0,53	-0,25	0,14	-0,48	-0,49	0,01	-0,02	-0,33	0,54	0,14	0,08	0,44	0,44	0,05	-0,11
[579] Waste, parings and scrap, of plastics	Neutral	0,57	0,49	-0,19	-0,19	0,52	0,56	-0,29	0,17	0,06	-0,05	-0,04	0,35	-0,14	-0,23	0,21	0,13	0,34	0,42	-0,21	-0,20
[581] Tubes, pipes and hoses of plastics	Neutral	-0,41	-0,48	-0,11	-0,34	0,47	0,46	-0,10	0,11	0,34	0,34	-0,34	0,10	0,36	0,45	0,15	-0,09	-0,44	-0,52	-0,08	0,06
[582] Plates, sheets, films, foil & strip, of plastics	Contracting	-0,42	0,06	0,19	0,10	-0,35	0,60	-0,57	0,07	0,45	0,76	0,25	0,30	0,29	0,76	0,03	0,06	-0,21	-0,73	-0,24	0,02
[583] Monofilaments, of plastics, cross-section > 1mm	Contracting	0,09	0,40	0,05	-0,02	-0,26	0,01	0,29	0,02	0,55	0,67	-0,07	0,35	0,47	0,85	0,16	-0,04	-0,51	-0,60	0,26	0,17

[591] Insectides & similar products, for retail sale	Neutral	-0,79	-0,47	0,24	0,00	0,54	0,69	-0,14	0,36	-0,36	0,48	0,42	0,10	-0,48	-0,65	-0,03	-0,06	-0,46	-0,47	-0,08	-0,10
[592] Starche, wheat gluten; albuminoidal substances; glues	Contracting	0,37	0,90	0,25	0,14	0,67	0,54	-0,45	0,27	-0,35	-0,23	-0,13	0,16	-0,25	0,63	0,03	-0,04	0,28	-0,20	0,29	0,33
[593] Explosives and pyrotechnic products	Expanding	-0,50	-0,50	-0,07	-0,11	-0,49	0,49	0,16	-0,40	-0,60	-0,63	0,00	0,26	-0,43	-0,45	-0,16	-0,09	0,91	-0,13	0,30	0,17
[597] Prepared addit. for miner. oils; lubricat., de-icing	Expanding	-0,45	0,54	-0,10	-0,04	-0,52	0,48	0,14	-0,04	-0,34	0,51	0,11	0,26	-0,51	0,29	-0,18	0,15	0,44	0,21	0,23	-0,03
[598] Miscellaneous chemical products, n.e.s.	Expanding	-0,49	0,47	0,20	0,04	0,26	0,54	-0,32	0,01	-0,32	0,62	-0,22	-0,03	-0,41	0,62	-0,19	-0,05	0,49	0,50	0,12	0,11
[611] Leather	Expanding	-0,54	-0,67	-0,06	-0,19	-0,48	-0,48	-0,20	0,20	0,96	0,56	-0,12	0,35	-0,03	0,81	0,35	0,27	0,18	0,33	-0,10	-0,01
[612] Manufactures of leather, n.e.s.; saddlery & harness	Contracting	0,03	-0,12	0,38	0,33	-0,64	-0,25	0,01	-0,13	0,63	0,74	-0,03	0,18	0,23	0,95	0,00	0,08	-0,44	-0,39	-0,54	-0,42
[613] Fur skins, tanned or dressed, excluding those of 8483	Expanding	-0,48	-0,48	-0,38	-0,43	-0,50	-0,52	0,20	0,01	0,25	0,49	0,11	0,10	0,03	0,30	0,14	-0,03	0,22	0,31	0,09	0,15
[621] Materials of rubber (pastes, plates, sheets, etc.)	Neutral	-0,71	-0,50	0,23	0,16	0,28	0,59	-0,21	0,01	0,38	0,57	0,01	0,06	0,32	0,41	-0,02	-0,14	-0,41	-0,57	-0,16	-0,19
[625] Rubber tires, tire treads or flaps & inner tubes	Neutral	-0,68	-0,60	0,05	-0,10	0,22	0,62	-0,22	0,00	0,45	0,70	-0,03	0,27	-0,04	-0,97	0,23	-0,15	-0,35	-0,61	0,16	0,19
[629] Articles of rubber, n.e.s.	Neutral	-0,42	-0,57	0,22	0,03	0,21	0,85	-0,01	0,25	0,54	0,57	0,20	0,37	0,08	0,27	0,11	-0,04	-0,12	-0,40	-0,08	0,26
[633] Cork manufactures	Expanding	-0,50	-0,54	-0,17	-0,34	0,48	0,49	-0,17	0,09	-0,24	0,61	0,08	0,05	-0,52	-0,84	-0,04	0,03	0,66	0,97	-0,21	-0,13
[634] Veneers, plywood, and other wood worked, n.e.s.	Neutral	-0,53	-0,71	0,01	-0,17	-0,50	-0,51	-0,22	-0,32	-0,42	-0,56	0,13	-0,05	-0,30	-0,50	0,16	-0,20	-0,13	-0,47	-0,13	0,00
[635] Wood manufacture, n.e.s.	Neutral	-0,21	-0,28	-0,23	-0,53	-0,58	-0,98	-0,19	0,26	-0,16	-0,29	0,15	0,09	-0,24	-0,60	0,38	-0,19	-0,19	-0,42	-0,24	-0,13
[641] Paper and paperboard	Expanding	-0,74	0,24	0,13	0,07	-0,46	0,68	-0,20	0,20	-0,42	0,43	0,14	0,27	-0,47	-0,55	0,05	-0,07	0,60	0,94	0,08	0,28
[642] Paper & paperboard, cut to shape or size, articles	Contracting	0,06	0,47	0,10	-0,04	-0,31	0,43	0,04	0,40	0,28	0,12	-0,14	0,42	0,45	0,85	0,42	0,07	-0,40	-0,58	0,04	0,05
[651] Textile yarn	Neutral	-0,24	-0,14	0,06	0,01	-0,21	0,50	-0,18	0,39	0,61	0,07	-0,38	0,26	0,38	0,80	0,47	0,15	-0,37	-0,51	-0,13	-0,06
[652] Cotton fabrics, woven	Neutral	-0,35	-0,84	0,06	-0,19	-0,31	0,69	-0,33	0,32	0,97	0,38	-0,18	0,07	0,37	0,25	0,46	-0,07	-0,36	-0,39	-0,19	0,05

[653] Fabrics, woven, of man-made fabrics	Neutral	-0,61	-0,49	-0,33	-0,42	0,40	0,33	-0,41	0,38	0,62	0,24	-0,20	-0,05	0,44	0,03	0,44	0,18	-0,35	-0,31	-0,09	-0,06
[654] Other textile fabrics, woven	Contracting	-0,42	0,11	-0,16	-0,27	0,09	0,80	-0,20	0,05	0,50	0,37	-0,02	0,04	-0,26	0,33	-0,10	0,12	-0,24	-0,99	-0,28	-0,27
[655] Knitted or crocheted fabrics, n.e.s.	Contracting	0,38	0,56	0,25	0,02	-0,40	-0,13	-0,43	0,27	0,52	0,67	-0,09	0,08	0,52	0,70	0,38	0,09	-0,49	-0,54	-0,32	-0,14
[656] Tulles, trimmings, lace, ribbons & other small wares	Neutral	-0,26	-0,94	0,14	-0,17	0,29	0,57	-0,25	0,16	0,39	-0,39	0,23	0,41	-0,22	-0,39	0,26	0,07	-0,46	-0,67	0,01	0,11
[657] Special yarn, special textile fabrics & related	Expanding	-0,39	0,00	0,20	-0,02	0,73	0,47	-0,09	0,25	0,09	0,05	0,11	0,27	0,32	0,70	0,19	-0,01	0,25	0,40	-0,06	0,09
[658] Made-up articles, of textile materials, n.e.s.	Contracting	0,46	0,45	0,00	-0,19	0,57	0,67	0,18	0,10	0,49	-0,52	-0,14	0,37	0,50	-0,44	0,42	-0,10	-0,51	-0,57	-0,37	0,02
[659] Floor coverings, etc.	Neutral	-0,11	-0,74	0,03	-0,20	-0,80	-0,60	-0,04	0,09	0,48	0,57	0,03	0,35	0,48	0,54	0,38	0,22	-0,49	-0,52	0,07	0,35
[661] Lime, cement, fabricant. constr. mat. (excluding glass, clay)	Expanding	-0,45	-0,56	-0,06	-0,11	0,47	0,53	0,20	0,11	0,47	0,41	0,32	0,39	0,36	-0,49	0,06	-0,15	-0,23	0,53	-0,22	0,06
[662] Clay construction, refracto. construction materials	Contracting	0,18	0,43	0,21	0,11	-0,21	-0,07	0,02	0,08	0,37	-0,51	-0,02	0,15	0,41	0,83	0,27	0,19	-0,33	-0,35	0,12	0,18
[663] Mineral manufactures, n.e.s.	Contracting	-0,14	0,56	-0,04	-0,13	-0,50	0,29	-0,15	0,16	0,21	0,70	0,00	0,15	-0,18	-0,22	0,04	-0,18	0,33	-0,14	0,02	-0,03
[664] Glass	Contracting	0,13	0,16	0,31	0,20	0,25	0,67	0,07	0,13	0,28	0,15	-0,27	0,04	-0,11	-0,53	0,05	-0,17	0,02	-0,25	0,28	0,38
[665] Glassware	Contracting	0,43	0,46	0,10	-0,08	0,63	0,99	-0,31	-0,03	-0,74	-0,63	0,16	-0,14	0,45	0,62	0,45	0,28	-0,56	-0,95	-0,43	-0,36
[666] Pottery	Neutral	-0,32	-0,37	-0,21	-0,43	-0,65	-0,34	-0,21	0,19	-0,87	-0,44	-0,01	-0,13	0,36	-0,32	-0,06	-0,24	-0,27	-0,06	0,08	0,33
[667] Pearls, precious & semi-precious stones	Contracting	-0,54	0,41	-0,30	-0,38	0,30	0,39	-0,14	0,13	0,79	0,52	0,03	-0,02	0,32	0,91	-0,21	-0,20	-0,64	-0,55	-0,13	0,11
[671] Pig iron & spiegeleisen, sponge iron, powder & granu	Neutral	-0,57	-0,51	-0,38	-0,37	-0,62	-0,48	-0,08	-0,04	0,63	0,67	0,04	0,05	0,37	0,39	-0,02	-0,02	-0,55	-0,78	-0,21	-0,12
[672] Ingots, primary forms, of iron or steel; semi-finis.	Neutral	-0,49	-0,49	-0,21	-0,19	0,47	0,49	-0,34	0,31	-0,51	-0,51	0,13	-0,31	0,53	0,60	0,14	0,41	-0,37	-0,54	0,23	0,23
[673] Flat-rolled prod., iron, non-alloy steel, not coated	Contracting	0,79	0,62	0,21	0,20	-0,28	-0,17	-0,39	0,15	-0,49	-0,54	-0,01	0,16	-0,65	-0,04	-0,14	-0,07	0,19	0,23	0,01	0,19

[674] Flat-rolled prod., iron, non-alloy steel, coated, clad	Neutral	-0,48	-0,54	0,13	-0,03	-0,29	0,00	0,07	0,14	0,40	0,61	0,16	0,08	0,02	0,55	0,12	-0,11	-0,12	-0,48	0,02	0,09
[675] Flat-rolled products of alloy steel	Contracting	-0,70	0,38	0,32	0,33	-0,52	0,45	-0,12	-0,06	-0,34	-0,16	0,28	-0,09	-0,44	0,73	-0,04	0,41	0,50	-0,42	0,14	-0,05
[676] Iron & steel bars, rods, angles, shapes & sections	Neutral	-0,62	-0,46	0,26	0,20	-0,52	-0,44	-0,12	0,05	-0,93	-0,56	0,14	0,03	-1,00	-0,59	-0,15	-0,29	-0,49	-0,57	-0,06	-0,20
[677] Rails & railway track construction mat., iron, steel	Expanding	-0,49	-0,49	-0,03	-0,02	0,45	0,45	-0,17	0,09	-0,27	-0,13	-0,04	0,12	-0,58	-0,66	-0,18	-0,17	0,54	0,53	0,30	0,32
[678] Wire of iron or steel	Contracting	0,34	0,35	0,17	0,15	-0,71	-0,13	-0,24	0,05	0,09	0,00	0,06	0,18	0,35	0,46	0,16	-0,17	-0,39	-0,40	-0,04	0,23
[679] Tubes, pipes & hollow profiles, fittings, iron, steel	Neutral	-0,63	-0,90	-0,10	-0,19	-0,26	-0,13	0,06	0,37	0,36	0,26	0,25	-0,06	-0,49	-0,39	0,04	0,07	-0,44	-0,54	-0,19	-0,13
[681] Silver, platinum, other metals of the platinum group	Neutral	-0,77	-0,27	-0,18	-0,17	-0,38	-0,31	-0,26	-0,09	-0,20	0,16	0,07	-0,11	0,40	0,43	-0,25	-0,34	-0,55	-0,67	-0,01	-0,14
[682] Copper	Neutral	0,47	0,32	-0,02	-0,07	-0,43	-0,47	0,11	0,02	-0,37	-0,50	-0,19	0,17	0,02	0,29	0,16	0,10	0,39	0,44	-0,09	0,16
[683] Nickel	Contracting	-0,48	0,44	-0,19	-0,13	-0,47	0,20	0,16	-0,39	-0,37	0,65	-0,29	-0,20	-0,32	-0,18	-0,10	0,01	-0,61	-0,87	-0,02	-0,16
[684] Aluminum	Expanding	-0,34	0,36	0,10	-0,02	0,58	0,78	-0,33	0,29	0,37	0,61	0,44	0,13	0,39	0,63	0,12	0,26	0,51	0,58	0,17	0,36
[685] Lead	Expanding	-0,90	-0,05	-0,12	-0,14	-0,58	-0,71	0,30	0,18	-0,48	-0,57	0,26	0,35	-0,11	0,59	0,25	0,17	0,64	-0,24	0,00	-0,02
[686] Zinc	Expanding	-0,39	-0,29	-0,41	-0,30	-0,71	-0,94	-0,21	0,05	-0,49	-0,50	0,11	-0,21	-0,49	-0,51	0,01	-0,12	0,49	0,50	0,08	0,10
[687] Tin	Contracting	0,50	0,50	-0,05	-0,14	0,52	0,86	-0,29	0,12	-0,62	-0,88	0,24	-0,08	-0,19	-0,12	0,21	-0,08	-0,54	-0,50	-0,29	-0,05
[689] Miscellaneous no-ferrous base metals for metallurgy.	Neutral	-0,69	-0,98	-0,06	-0,10	-0,49	-0,33	0,11	-0,04	1,00	0,73	-0,02	-0,09	0,49	0,82	0,21	0,38	-0,50	-0,77	-0,44	-0,34
[691] Structures & parts, n.e.s., of iron, steel, aluminum	Neutral	-0,14	-0,03	-0,18	-0,47	0,16	0,25	0,01	0,09	0,36	0,28	0,13	0,24	-0,21	-0,46	0,10	0,00	-0,80	-0,38	-0,15	-0,02
[692] Metal containers for storage or transport	Contracting	0,23	0,30	-0,39	-0,36	-0,86	-0,26	-0,12	-0,04	0,46	0,56	0,16	0,22	-0,43	-0,64	0,28	-0,04	-0,19	0,72	-0,13	0,12
[693] Wire products (excluding electrical) and fencing grills	Contracting	0,43	0,59	0,10	0,06	-0,41	-0,08	0,16	0,11	0,44	0,29	0,13	0,40	0,50	0,60	0,21	0,00	-0,50	-0,55	-0,03	0,29
[694] Nails, screws, nuts, bolts, rivets & the like, of metal	Expanding	-0,47	-0,79	0,04	-0,27	-0,36	-0,03	-0,21	0,02	0,53	0,57	0,20	0,09	0,05	0,61	0,00	-0,03	0,29	-0,24	-0,03	0,16

[695] Tools for use in the hand or in machine	Expanding	-0,49	-0,57	0,07	-0,08	0,38	0,47	-0,12	0,14	-0,11	0,00	0,01	0,19	-0,30	-0,11	0,06	-0,01	0,04	-0,55	-0,02	0,01
[696] Cutlery	Expanding	-0,38	-0,36	0,13	-0,22	-0,52	0,42	-0,51	0,34	-0,50	-0,55	-0,10	0,04	-0,28	0,82	0,10	-0,15	0,46	-0,43	0,28	0,27
[697] Household equipment of base metal, n.e.s.	Contracting	0,24	0,02	-0,15	-0,25	0,56	0,98	-0,16	0,13	-0,43	-0,69	-0,19	0,08	0,33	-0,32	0,36	-0,18	-0,33	-0,26	-0,25	0,07
[699] Manufactures of base metal, n.e.s.	Neutral	-0,31	-0,14	0,19	-0,17	-0,54	0,39	0,29	-0,06	0,31	0,65	0,12	0,38	0,17	0,65	0,18	-0,01	-0,24	-0,64	0,00	0,16
[711] Vapor generating boilers, auxiliary plant; parts	Expanding	-0,50	-0,51	0,16	-0,02	-0,30	-0,01	0,29	0,15	0,45	0,64	0,23	0,06	-0,23	0,05	-0,15	-0,08	0,91	0,21	0,14	0,17
[712] Steam turbines & other vapor turbine., parts, n.e.s.	Expanding	-0,67	0,17	-0,21	-0,05	0,52	0,52	0,11	0,16	-0,23	0,12	-0,01	-0,10	-0,71	-0,31	-0,04	0,06	0,51	0,51	0,32	0,25
[713] Internal combustion piston engines, parts, n.e.s.	Neutral	-0,50	-0,63	0,04	0,05	-0,26	0,37	-0,19	-0,14	-0,21	0,19	0,14	-0,02	-0,17	0,98	-0,15	0,08	-0,01	-0,45	0,26	0,29
[714] Engines & motors, non-electric; parts, n.e.s.	Contracting	0,81	0,60	0,29	0,16	-0,48	-0,50	0,11	-0,26	-0,15	-0,14	-0,24	-0,08	-0,44	-0,50	-0,05	0,19	-0,52	-0,45	-0,10	-0,20
[716] Rotating electric plant & parts thereof, n.e.s.	Expanding	-0,39	-0,34	-0,11	-0,24	-0,51	0,42	0,24	0,18	0,66	0,69	-0,35	0,11	-0,72	0,35	0,32	0,25	0,63	-0,34	0,18	0,16
[718] Other power generating machinery & parts, n.e.s.	Contracting	0,55	0,50	0,15	0,10	0,44	0,45	0,11	0,23	-0,15	-0,24	0,38	-0,02	-0,43	0,45	0,00	0,03	0,04	-0,81	0,07	-0,05
[721] Agricultural machinery (excluding tractors) & parts	Expanding	-0,36	-0,30	-0,23	-0,26	-0,66	0,46	0,23	-0,35	-0,48	-0,53	0,06	0,01	-0,47	-0,58	-0,11	-0,01	0,29	0,04	0,09	0,06
[722] Tractors (excluding those of 71414 & 74415)	Neutral	-0,40	-0,31	0,15	0,17	0,58	0,84	0,00	0,11	-0,81	-0,83	-0,31	0,05	-0,18	-0,39	-0,16	-0,13	-0,65	-0,50	0,04	0,06
[723] Civil engineering & contractors' plant & equipment	Expanding	-0,51	-0,53	0,01	-0,10	-0,50	-0,51	0,32	0,03	-0,40	-0,43	0,01	0,13	-0,39	-0,41	-0,14	-0,03	0,19	-0,90	0,16	0,21
[724] Textile & leather machinery, & parts thereof, n.e.s.	Expanding	-0,50	-0,52	0,32	0,21	-0,47	-0,45	0,19	-0,10	0,63	0,54	0,19	0,28	-0,48	-0,53	-0,12	-0,35	0,50	0,52	0,21	0,23
[725] Paper mill, pulp mill machinery; paper articles man.	Expanding	-0,44	0,54	0,05	0,03	0,50	0,49	-0,02	0,06	-0,49	-0,51	0,14	-0,18	-0,19	0,81	-0,17	-0,11	0,45	0,46	0,24	0,18
[726] Printing & bookbinding machinery, & parts thereof	Expanding	-0,50	-0,50	-0,16	-0,18	-0,90	0,39	0,10	-0,08	-0,41	-0,20	-0,30	-0,01	-0,48	-0,50	-0,16	-0,27	0,50	0,53	0,15	0,29

[727] Food-processing machines (excluding domestic)	Neutral	-0,47	-0,53	0,09	0,01	0,50	0,87	0,03	-0,29	0,01	-0,13	0,01	0,41	-0,22	0,23	0,06	0,17	-0,43	-0,56	-0,08	0,04
[728] Other machinery for particular industries, n.e.s.	Expanding	-0,49	-0,50	-0,17	-0,10	0,22	0,51	-0,25	-0,19	-0,10	0,15	-0,36	0,07	-0,41	-0,48	-0,21	-0,27	0,02	-0,83	0,35	-0,11
[731] Machine-tools working by removing material	Neutral	-0,46	-0,28	-0,15	-0,22	-0,53	0,46	0,00	-0,21	-0,34	-0,27	0,15	0,12	-0,43	-0,51	-0,08	-0,12	-0,58	-0,47	0,08	0,12
[733] Mach.-tools for working metal, excluding removing mate.	Neutral	-0,38	-0,31	0,09	-0,08	0,30	0,42	0,24	0,15	-0,14	-0,27	0,22	-0,08	-0,19	0,00	0,14	0,11	-0,56	-0,69	0,18	0,25
[735] Parts, n.e.s., & accessories for machines of 731, 733	Neutral	-0,49	-0,64	-0,23	-0,33	-0,46	0,50	0,02	-0,21	-0,26	-0,26	-0,03	0,07	-0,53	-0,84	-0,20	-0,26	-0,27	-0,67	0,04	-0,07
[737] Metalworking machinery (excluding machine-tools) & parts	Contracting	0,47	0,47	0,05	0,04	-0,59	-0,85	0,13	0,08	-0,48	-0,54	0,00	0,09	-0,38	0,26	-0,13	0,07	-0,69	-0,73	0,03	0,06
[741] Heating & cooling equipment & parts thereof, n.e.s.	Contracting	-0,39	0,51	0,03	-0,02	-0,70	0,46	0,32	0,06	0,04	0,79	-0,17	0,30	0,60	0,43	0,39	0,27	-0,38	-0,76	-0,04	-0,01
[742] Pumps for liquids	Expanding	-0,41	-0,41	0,00	-0,05	-0,55	-0,63	-0,01	-0,06	-0,48	-0,91	0,11	0,04	-0,28	0,83	0,19	0,24	0,18	-0,59	0,02	0,05
[743] Pumps (excluding liquid), gas compressors & fans; centr.	Expanding	-0,47	-0,66	-0,28	-0,44	-0,48	0,49	-0,05	0,07	-0,16	0,45	-0,27	0,27	-0,38	0,37	0,11	0,07	0,39	-0,42	0,14	0,11
[744] Mechanical handling equipment, & parts, n.e.s.	Expanding	-0,53	-0,57	-0,23	-0,44	0,52	0,50	-0,04	0,10	-0,27	-0,16	-0,08	0,04	-0,42	0,20	-0,04	0,11	0,40	-0,52	0,14	-0,03
[745] Other non-electr. machinery, tools & mechanic. appear.	Neutral	-0,44	-0,39	-0,21	-0,19	0,56	0,53	0,23	0,06	-0,42	-0,49	-0,32	0,27	-0,14	0,63	0,05	0,18	-0,25	-0,54	0,11	0,28
[746] Ball or roller bearings	Contracting	-0,41	0,54	0,21	0,13	-0,35	0,45	-0,30	0,06	-0,39	0,01	0,24	-0,03	-0,23	0,39	-0,07	-0,23	0,36	-0,45	0,13	0,27
[747] Appliances for pipes, boiler shells, tanks, vats, etc.	Neutral	-0,35	-0,25	-0,13	-0,24	-0,47	-0,48	-0,02	0,06	-0,01	0,91	-0,07	0,11	0,22	0,66	0,04	0,13	-0,42	-0,83	0,22	0,22
[748] Transmit. shafts	Contracting	-0,19	0,86	0,09	-0,05	-0,53	0,28	0,06	-0,11	0,36	0,60	-0,01	-0,03	0,01	0,83	0,14	0,27	0,06	-0,47	0,26	0,24
[749] Non-electric parts & accessor. of machinery, n.e.s.	Neutral	-0,67	-0,63	0,05	-0,14	-0,41	0,55	0,16	0,12	-0,46	-0,51	0,04	0,25	0,88	0,49	0,10	0,13	-0,63	-0,69	-0,05	-0,03

[751] Office machines	Expanding	-0,50	0,24	0,17	-0,06	0,66	0,52	-0,46	0,21	-0,50	-0,50	0,12	-0,03	-0,47	0,50	-0,07	-0,32	0,55	0,74	-0,21	-0,11
[752] Automatic data processing machines, n.e.s.	Contracting	-0,46	0,71	0,17	0,26	-0,55	0,31	-0,12	-0,03	-0,49	-0,50	-0,23	-0,20	-0,40	0,50	0,20	0,08	0,05	-0,77	-0,07	-0,04
[759] Parts, accessories for machines of groups 751, 752	Expanding	-0,46	-0,41	0,03	-0,11	-0,50	0,50	-0,27	0,00	-0,49	-0,49	0,19	0,02	-0,38	0,53	0,22	0,26	0,49	0,51	-0,26	-0,02
[761] Television receivers, whether or not combined	Contracting	0,27	-0,93	0,40	0,15	0,39	0,45	-0,22	0,16	0,43	0,25	0,11	0,11	0,36	0,40	0,30	-0,08	-0,10	0,00	-0,46	-0,20
[762] Radio-broadcast receivers, whether or not combined	Neutral	-0,57	-0,68	-0,35	-0,43	-0,52	0,49	-0,05	0,02	-0,45	-0,40	-0,31	0,17	-0,51	-0,52	0,08	-0,11	-0,48	-0,49	-0,22	0,08
[763] Sound recorders or reproducers	Expanding	-0,43	-0,35	0,24	0,08	-0,26	0,02	-0,15	0,37	-0,74	-0,66	-0,16	-0,17	-0,77	-0,45	-0,11	-0,25	0,46	-0,50	-0,23	-0,06
[764] Telecommunication equipment, n.e.s.; & parts, n.e.s.	Contracting	-0,28	0,46	-0,13	-0,27	-0,44	-0,21	0,20	0,10	-0,39	-0,23	0,20	-0,02	-0,44	0,52	0,04	-0,12	-0,29	-0,43	-0,01	0,14
[771] Electric power machinery, and parts thereof	Contracting	0,12	0,37	0,33	0,14	-0,09	0,93	-0,04	0,31	-0,30	-0,99	0,14	0,02	0,17	0,12	0,37	0,21	0,32	-0,10	-0,34	-0,19
[772] Apparatus for electrical circuits; board, panels	Contracting	-0,30	0,64	0,39	0,12	0,87	0,54	0,09	0,47	-0,36	-0,25	0,29	0,31	-0,27	0,46	0,18	0,12	-0,18	-0,94	-0,07	-0,01
[773] Equipment for distributing electricity, n.e.s.	Contracting	0,49	0,63	0,35	0,13	0,05	0,52	-0,17	0,23	0,39	-0,16	0,36	0,23	0,42	0,61	0,46	0,37	-0,46	-0,86	-0,21	-0,01
[774] Electro-diagnostic appa. for medical sciences, etc.	Expanding	-0,49	-0,49	0,07	-0,08	0,52	0,50	0,04	0,09	-0,48	-0,48	-0,13	-0,02	-0,51	0,47	-0,07	0,13	0,38	-0,66	-0,03	-0,27
[775] Household type equipment, electrical or not, n.e.s.	Neutral	-0,40	-0,60	-0,04	-0,07	-0,31	0,56	0,15	0,08	0,37	-0,87	0,15	0,14	0,40	0,08	0,28	0,02	-0,35	-0,34	-0,03	-0,08
[776] Cathode valves & tubes	Expanding	-0,50	-0,52	0,11	-0,08	-0,51	0,44	-0,19	0,06	0,51	0,50	0,44	0,22	-0,28	0,59	0,18	0,31	0,61	-0,32	0,31	0,22
[778] Electrical machinery & apparatus, n.e.s.	Contracting	-0,10	0,56	0,15	-0,04	-0,39	0,57	-0,21	-0,01	-0,41	-0,54	0,20	0,03	-0,37	0,08	0,04	0,00	-0,05	-0,78	-0,11	-0,12
[781] Motor vehicles for the transport of persons	Neutral	-0,41	-0,39	0,11	0,08	-0,50	-0,52	0,04	-0,19	0,96	0,54	0,22	-0,08	-0,44	-0,61	-0,28	-0,40	-0,65	-0,49	-0,25	-0,09
[782] Motor vehic. for transport of goods, special purpo.	Expanding	-0,47	-0,47	-0,15	-0,22	-0,11	0,14	0,18	-0,17	0,54	0,74	0,09	0,31	0,17	-0,05	-0,14	-0,13	0,40	0,20	-0,01	0,01
[783] Road motor vehicles, n.e.s.	Expanding	-0,24	-0,20	0,08	0,01	-0,52	-0,56	0,06	-0,23	0,40	0,57	-0,06	0,33	-0,99	-0,77	-0,01	-0,16	0,12	-0,15	0,04	0,15

[784] Parts & accessories of vehicles of 722, 781, 782, 783	Contracting	-0,30	0,56	0,04	0,03	-0,44	-0,40	-0,07	-0,08	-0,03	0,75	0,23	0,09	-0,08	0,68	-0,13	-0,15	-0,24	-0,73	0,35	0,34
[785] Motorcycles & cycles	Neutral	-0,47	-0,56	0,09	-0,08	-0,53	-0,66	-0,17	0,14	-0,48	-0,69	0,03	0,08	-0,62	-0,49	0,08	-0,19	-0,72	-0,51	-0,11	-0,11
[786] Trailers & semi-trailers	Expanding	-0,46	-0,58	-0,18	-0,19	0,63	0,86	0,02	0,21	0,74	0,58	0,05	0,13	-0,27	-0,48	-0,07	-0,06	0,35	0,97	0,07	0,20
[791] Railway vehicles & associated equipment	Expanding	-0,50	-0,50	0,18	0,15	0,50	0,50	0,27	0,04	0,52	0,92	0,25	-0,06	0,48	0,49	0,17	0,16	0,38	0,41	0,17	0,20
[792] Aircraft & associated equipment; spacecraft, etc.	Contracting	-0,51	0,45	-0,18	-0,10	-0,61	-0,70	0,21	0,09	-0,44	-0,45	0,08	-0,27	-0,58	-0,64	-0,14	0,00	-0,40	-0,44	0,31	-0,03
[793] Ships, boats & floating structures	Neutral	-0,29	-0,07	0,25	0,24	0,59	0,53	0,26	0,03	0,22	0,14	-0,05	0,22	-0,87	-0,68	-0,18	-0,11	-0,88	-0,65	-0,34	-0,14
[811] Prefabricated buildings	Expanding	-0,37	-0,23	-0,05	0,04	-0,51	-0,52	0,09	-0,19	-0,63	-0,53	0,36	-0,09	-0,59	-0,51	0,02	-0,08	0,55	0,53	-0,12	-0,11
[812] Sanitary, plumbing, heating fixtures, fittings, n.e.s.	Contracting	0,39	0,69	0,29	0,23	0,99	0,59	0,31	0,17	0,20	-0,59	0,04	0,34	0,25	-0,12	0,26	-0,24	-0,38	-0,63	0,13	0,22
[813] Lighting fixtures & fittings, n.e.s.	Expanding	-0,22	-0,22	-0,12	-0,12	0,53	0,44	-0,12	0,06	0,02	-0,68	-0,03	0,19	-0,05	0,12	0,13	0,09	0,34	0,51	-0,22	-0,06
[821] Furniture & parts	Expanding	-0,20	-0,16	-0,06	-0,27	-0,39	0,63	0,23	0,30	0,19	-0,83	-0,27	0,31	0,39	0,77	0,20	-0,17	-0,23	0,48	-0,07	0,07
[831] Travel goods, handbags & similar containers	Neutral	-0,24	-0,63	-0,13	-0,34	-0,14	0,10	-0,18	-0,13	0,25	0,03	-0,28	-0,16	0,34	0,54	0,23	0,19	-0,25	-0,36	0,02	0,02
[841] Men's clothing of textile fabrics, not knitted	Neutral	-0,58	-0,52	-0,07	-0,41	0,46	0,56	-0,06	0,35	0,48	-0,48	-0,30	0,09	0,47	-0,18	0,06	-0,28	-0,44	-0,71	-0,08	0,00
[842] Women's clothing, of textile fabrics	Expanding	0,22	-0,53	-0,05	-0,34	0,46	0,52	-0,21	0,30	0,55	-0,44	-0,29	-0,05	0,48	-0,32	0,17	-0,13	-0,42	0,38	-0,18	-0,03
[843] Men's or boy's clothing, of textile, knitted, croche.	Neutral	-0,84	-0,51	-0,12	-0,40	-0,55	-0,52	-0,34	0,05	0,50	-0,48	-0,25	0,13	0,13	-0,44	0,30	-0,21	-0,43	-0,41	0,06	0,12
[844] Women's clothing, of textile, knitted or crocheted	Neutral	-0,54	-0,51	-0,06	-0,31	-0,51	-0,48	-0,12	-0,01	-0,58	-0,51	-0,19	-0,15	0,79	0,51	0,42	-0,20	-0,48	-0,49	-0,24	0,02
[845] Articles of apparel, of textile fabrics, n.e.s.	Contracting	0,45	0,16	-0,09	-0,41	0,36	0,06	0,06	0,26	0,44	-0,51	-0,28	-0,13	0,49	0,10	0,01	-0,31	-0,47	-0,50	0,07	0,08
[846] Clothing accessories, of textile fabrics	Contracting	0,05	-0,57	0,12	-0,11	0,52	0,80	0,28	0,27	0,57	-0,39	-0,08	0,15	0,47	0,50	0,40	0,08	-0,47	-0,50	-0,44	-0,01
[848] Articles of apparel, clothing	Neutral	-0,52	-0,50	0,28	-0,15	0,99	0,75	-0,46	0,27	-0,66	-0,50	-0,42	-0,13	0,37	-0,44	0,18	-0,27	-0,44	-0,47	-0,03	-0,12

access., excluding textile																					
[851] Footwear	Neutral	0,02	0,04	-0,16	-0,36	-0,82	-0,51	-0,22	-0,01	-0,49	-0,79	-0,15	-0,10	0,57	0,72	0,29	-0,20	0,36	0,44	-0,04	0,00
[871] Optical instruments & apparatus, n.e.s.	Expanding	-0,38	-0,34	0,00	-0,01	-0,64	0,48	-0,14	-0,03	-0,51	-0,52	0,06	0,27	0,68	0,52	0,10	-0,10	0,10	-0,62	-0,19	-0,12
[872] Instruments & appliances, n.e.s., for medical, etc.	Contracting	-0,40	0,67	-0,16	-0,22	-0,33	0,52	-0,37	0,25	-0,42	-0,44	0,08	0,07	-0,15	0,52	0,18	0,16	0,27	-0,61	0,12	-0,01
[873] Meters & counters, n.e.s.	Contracting	-0,06	0,63	0,29	0,23	-0,56	-0,84	-0,03	-0,01	0,20	0,71	0,14	0,30	0,27	0,65	0,12	0,09	-0,25	-0,91	0,05	-0,11
[874] Measuring, analyzing & controlling apparatus, n.e.s.	Contracting	-0,50	0,43	0,00	-0,07	-0,98	0,39	-0,05	-0,29	-0,45	-0,47	-0,16	0,03	-0,43	0,88	-0,04	0,06	0,40	-0,50	0,30	-0,05
[881] Photographic apparatus & equipment, n.e.s.	Expanding	-0,46	-0,43	0,26	0,06	-0,57	0,44	-0,47	-0,18	0,53	0,50	-0,37	0,07	-0,49	0,34	0,14	0,11	0,59	0,61	-0,03	0,11
[882] Cinematographic & photographic supplies	Expanding	-0,45	0,56	-0,02	0,21	-0,51	0,45	-0,38	0,14	-0,41	0,63	0,26	0,11	-0,42	0,53	-0,25	0,03	0,45	0,43	0,35	0,26
[883] Cinematograph films, exposed & developed	Contracting	0,42	0,61	-0,14	-0,20	0,32	0,66	-0,27	0,26	-0,44	-0,41	0,27	-0,20	0,50	0,49	-0,03	0,04	-0,58	-0,53	0,10	0,26
[884] Optical goods, n.e.s.	Expanding	-0,46	-0,38	-0,06	-0,29	-0,39	0,28	-0,54	0,09	-0,48	-0,49	0,11	0,09	-0,52	0,22	0,00	0,03	0,43	-0,54	0,01	0,04
[885] Watches & clocks	Contracting	-0,48	0,50	0,28	0,16	-0,49	-0,40	-0,25	-0,01	-0,43	0,54	-0,28	-0,33	-0,51	0,46	-0,12	0,03	0,44	-0,88	0,21	-0,06
[891] Arms & ammunition	Expanding	-0,49	-0,50	-0,12	-0,15	0,40	0,41	-0,01	-0,04	0,78	0,58	0,08	-0,07	-0,23	-0,02	-0,25	-0,26	0,40	0,53	-0,26	-0,23
[892] Printed matter	Contracting	0,21	0,82	0,08	0,08	0,17	0,45	-0,10	0,09	-0,15	-0,18	0,09	0,17	0,24	0,92	0,33	0,27	0,13	-0,36	-0,06	-0,10
[893] Articles, n.e.s., of plastics	Contracting	-0,14	0,13	-0,01	-0,02	0,29	0,59	-0,15	0,31	0,34	0,85	-0,20	0,36	-0,03	0,10	0,27	-0,12	-0,19	-0,68	-0,34	-0,12
[894] Baby carriages, toys, games & sporting goods	Expanding	-0,45	-0,44	-0,01	-0,25	-0,54	-0,83	-0,32	0,01	-0,44	-0,54	-0,26	0,20	-0,37	0,68	-0,03	0,05	0,36	0,62	-0,12	0,23
[895] Office & stationery supplies, n.e.s.	Expanding	-0,47	-0,61	0,01	-0,13	-0,44	-0,13	-0,38	0,16	-0,43	0,21	0,18	0,15	-0,58	0,28	0,27	0,14	0,45	0,47	0,07	0,12
[896] Works of art, collectors' pieces & antiques	Contracting	0,45	0,48	0,27	0,29	-0,44	-0,44	-0,05	-0,12	-0,72	-0,90	-0,24	0,25	0,33	0,63	0,03	0,02	-0,49	-0,49	-0,05	-0,04
[897] Jewelry & articles of precious material., n.e.s.	Contracting	0,05	-0,04	0,06	-0,12	0,34	0,45	-0,01	0,36	0,32	-0,29	-0,38	0,20	0,38	0,49	0,13	-0,03	-0,49	-0,55	-0,07	0,02
[898] Musical instruments, parts; records, tapes & similar	Expanding	-0,30	-0,41	0,02	-0,15	-0,92	-0,58	-0,13	0,17	-0,57	-0,76	0,14	-0,03	-0,54	0,40	0,26	0,14	0,46	-0,46	0,21	0,29

[899] Miscellaneous manufactured articles, n.e.s.	Contracting	-0,29	0,64	-0,01	-0,38	-0,44	0,51	-0,12	0,02	-0,41	-0,50	-0,22	0,19	0,14	0,52	0,34	-0,03	0,32	-0,63	-0,03	-0,07
[971] Gold, non-monetary (excluding gold ores and concentrates)	Neutral	0,71	0,68	0,52	0,52	-0,54	-0,56	-0,27	-0,14	0,54	0,52	0,02	0,04	-0,69	-0,59	-0,03	-0,38	0,84	0,89	0,24	0,15

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Chapter 3. Cross-Regional Effects on Labor Adjustment Costs in European Single Market: Dynamic Euclidean Distance Spatial Model

ABSTRACT

In undertaking the analysis of labor adjustments costs, this paper focuses on marginal IIT performance of member countries of EU-28. The geographical region determinants are applied as a weight matrix for estimating the level of adjustment costs. This paper moves beyond singular two-fold relations and aim to confine the effect of IIT on job turnover while monitoring the rest of relevant variables by using newly introduced weight matrix. So-called, Euclidean distance spatial model is used to determine weight accounts for EU regions. Through the three dimensions of the new matrix, a suitable proxy is provided for calculating adjustment pressures which are complex to estimate. An expected outcome is that closer member countries to the center of EU single market experience an increasing IIT share in total trade with relatively low adjustment pressure in their labor markets. In a further stage, at the point of smooth adjustment hypothesis, spatial two-stage least squares model (S2SLS) controls the inverse relationship between the marginal IIT levels and labor market adjustment costs. A distinctive impact of marginal IIT is inevitable on labor markets and results also shown likewise. The empirical research found robust results can be estimated as valid evidence for paradigms of new economic geography.

Jel Codes: F16, R3, R12

Key Words: trade and labor market interactions, new economic geography, size and spatial distributions of regional economic activity

1. INTRODUCTION

Momentarily, a spectacular resurgence of economists' interest has focused on spatial economics. The economics literature is started to reconcile with a thriving number of studies about measuring spatial agglomeration levels of industries at both country and regional levels. Moreover, spatial economics gives prominent statue for the combination of general equilibrium models and spatial econometric approaches that currently introduced in the literature. Hitherto, most of the empirical studies focus developed countries as sole trade counterparts. Such as newly became members of regional trade agreements and their transitional periods are quite neglected, so far.

Shifting toward freer trade approach elevates bilateral trade actions between trade partners. These free trade transitions are followed by fundamental changes in trade policies. Accordingly, new trade policies generate its own adjustment costs for domestic industries. Thorpe and Leitao (2012) argued that the labor adjustment costs in national economies increase when markets are inadequate to response policy changes in both supply and demand conditions. The stagnant production factors and price stickiness cause temporary unemployment and factor price rigidities in labor markets. The asymmetric situations cause adjustment pressures in labor markets which can be determined by following bilateral trade patterns between trade partners.

The bilateral trade between partner countries takes place in two separate ways: inter-industry trade or intra-industry trade. While inter-industry trade includes

different traded product types with large-scale, intra-industry trade (IIT) is the bilateral exchange of products with similar input requirements. The former trade type can be fostered much easier by focused policies which end up with increasing adjustment pressures on labor reallocation in contracting industries.

In the 1960s, the escalation of globalization process with substantial IIT flows started to counter the predictions of neo-classical trade theories. Balassa (1966) argued that following the increase in IIT is compatible with steady production is the proper approach to estimate adjustment costs for countries in transition. Since Balassa, smooth adjustment hypothesis (SAH) is accepted as a conventional approach which relates trade liberalization and allegedly low adjustment costs. A decade later, various countries switched their industrialization processes according to their trade policies. Recently adopted trade policies shape a new type of industrialization process for domestic industries. A more formidable form of free trade is achievable when domestic production system focused on export-oriented industrialization rather than import-substitution industrialization. Thus, the formational change in industrialization process resulted in expanding part of industries while rest of industries contracted. In this new chain of production and trade system, adjustment costs within similar trade products for relative factor intensities is easier to manage[13]. Particularly, the disruption within labor markets can be

[13] In matters of globalization, success of European Economic Community's (EEC) early liberalization in 1980s to 1990s was linked with increasing IIT (Grant, Popadakis and Richardson, 1993).

eased by increasing share of IIT, and of course, lower labor adjustment costs (Brülhart, 2000).

A similar transition of trade pattern happened in the new millennium, after the adaptation of Euro for European Union (EU). Until 2013, EU continued to expand its borders with newly participated member countries with its trade market potential. Almost all of these new members can be classified as developing countries compare to existing members. Consequently, the integration process to EU central policies become crucial to those new members. Therefore, the changing trade patterns have more impact for them in the process of harmonizing with EU. The results of this paper tend to support SAH. Eventually, the gains from bilateral trade by becoming a member of a mega-trade union overcomes adjustment pressures on labor markets. Likewise, geographical distance designates the weight of marginal IIT share on the disruption in labor markets for member countries in several EU regions.

The rest of paper is lined up as: section II includes a comprehensive summary of examining spatial economics literature on the behalf of the relation between adjustment pressures and IIT. In section III, methodological issues are given about spatial requirements that versatile levels of adjustment costs in different regions. The concise discussion is introduced upon the details of dynamic spatial panel data approach with the introduction of Euclidian distance (W) weight matrix. Then, measurement methods of marginal IIT as several indices are given. The section IV reports the empirical findings and final section V concludes this paper with a brief discussion of the inclusive results.

2. LITERATURE REVIEW

New trade theories (NTT) ignited the fostering speed of analytical and empirical research[14] on adjustment pressures on the labor market (Helpman and Krugman, 1985). NTT includes general equilibrium models into literature to estimate industrial agglomeration within regions, countries, and cities. These general equilibrium models are based on scale economies. These models take those assumptions into account the imperfect competition and horizontal product differentiation. Besides, diversified product variety with distinguishable quality levels is main indicators.

Thus, NTT suggests a simple theoretical intuition that higher factor reallocation is related to IIT expansion in overall trade. Redeployment of workers in another plant within the similar industry is more cost effective than to adopt them for production in an incomparable industry sector. Especially, IIT entails low adjustment costs which has become known SAH (Brülhart, 1998). Increasing trade between partners alongside expanding IIT share leads to relatively low adjustment pressures on labor markets in transition (Fujita and Mori, 1998). Broad surveys using SAH on location theory have been studied by several researchers.[15] In this study, international trade and regional economics are

[14] Sparkling study of Leontief (1953) about US trade relations with rest of the world has dominated spatial economics literature over four decades. His work presented that the US as a net importer in capital-intensive products and net exporter in labor-intensive products. The predictions of Hecksher-Ohlin was overrun according to his results. Today, Leontief Paradox[14] is solved via using trade data since the 1970s (Stern and Maskus, 1981) and combining factor endowments for exported goods and imported goods (Leamer, 1980). In addition to that, using Hecksher-Ohlin-Vanek (HOV) specification relates net export measures with trade-balance adjustments and clears the aspects of paradox in even Leontief's original data. In empirical analysis, researchers should aware of Leontief Paradox while exploring marginal IIT patterns for multi-country frameworks.

[15] The emergence of pervasive IIT renewed the attention in spatial economics; there are several considerable country-specific studies. Studies that found a negative outcomes for SAH as a determinant theory in IIT and labor adjustment costs are Tharakan and Calfat (1999) for Belgium, Brülhart and Thorpe (2000) for Malaysia, Greenaway, Hines and Milner (2002) for UK, while other studies found a positive results for SAH theory such as, Sarris, Papadimitriou, and Mavrogiannis (1994) for Greece, Brülhart (2000) for Ireland, Brülhart and Elliot (2002) for the UK and reached a conclusion that marginal IIT has a greater impact than static IIT measurement methods.

treated as sub-disciplines under spatial economics. Here onwards, new economic geography (NEG) and spatial economics are encompassed interchangeably with the broadest definition.

2.1. Industrial Agglomeration in EU Regions

In industrial agglomeration, production factors are mobile at the joint effects of geographical aspects of regions. Locational shifts in industries tend to follow production facilities with similar requirements. Therefore, agglomeration is a result of comprising production facilities of whole manufacturing activity in the region. The identification of agglomeration is quite understandable in NEG.[16]

According to NEG, decisions over choosing production locations are endogenous and explained via production factors, mobility capacity of companies with their international market share. Labor and production output levels are interchangeable. Volatile market size externalities and national trade policies determine bilateral trade trends for domestic industry sectors. Besides that, path dependency for trade relations and numerous equilibria models are distinctive characteristics of NEG models.

Agglomeration processes tend to follow self-features of industry sectors. Initial agglomeration of industries is benefited from whole possible equilibria of changing prices of immobile factors such as intermediate trade costs. Especially,

[16] The headmost example of accepting IIT results as determinants of international trade and agglomeration processes is the study of Greenaway and Torstensson (1997). They found a diminishingly increasing share of IIT in the empirical analysis of Swedish bilateral trade trends from 1972 to 1994. This study gained a prominent importance by identifying increasing pattern of interconnectedness between domestic industries for a country with changing its trade policies. Eventually, the literature of economics embraced changing IIT percentages in total trade as a new determinant while NEG employed IIT as a measurement tool for industrial agglomeration.

the center-periphery structure of industry sectors is an outcome of dynamic phase of economic integrations or dispersions. At the phase of economic integration with international markets, a spatially polarized economy is inclined to agglomerate domestic industry sectors in a non-monotonically pattern (Brülhart, 1998). Moreover, agglomeration can be driven by either increasing returns or factor endowments, such labor cost increase or decrease is happened by moving in to or away from industrial core locations (Hanson, 1997, 1998).

This paper aims to explore what extent regional influence on the relation between marginal IIT and adjustment pressures in labor markets. Neighboring cross-border regions are identified as common institutional links in European regional agglomeration for industries. Thus regions are separated in the light of integration possibilities within cultural and socio-economic backgrounds for countries.

2.2. Trade Theories and IIT

Even though countries share same production types and factor endowments, uneven geographical distances to target market create different trade frontiers. Trade possibilities are limited by geographical distances and apparent demand in those target markets. Krugman (1979) and Lancaster (1980) developed new theoretical frameworks to measure these different possibilities rather than using conventional H-O explanation. They introduced monopolistic competition models that identify increasing returns to scale along with apparent consumption as a key aspect for IIT. Helpman (1981), Eaton and Kierzkowski (1984), Helpman and Krugman (1985) also made notable contributions which predict relative resource endowments along with region size are expected to be direct proportion to the IIT percentage in total trade. Especially, against

traditional NCT theories, NTT period obtained IIT share by acknowledging the coefficients of product variety and scale economies are significant factors and high explanatory power for a study. [17]

NTT has developed an understanding to decompose IIT to its components. Several indexes[18] were introduced to refer traded products with different actual or perceived attributes. At the beginning, similar quality products have been the target of empirical studies while neglecting to distinguish static or dynamic aspects of bilateral trade pattern. However, the lack of analysis in quantitative and qualitative aspects of IIT as a single measure is an attractive issue in the spatial economics literature. In theory, the determinants of those aspects are fundamentally different from each other. Consequently, Falvey (1981) focused that the very beginning model of qualitative side of traded products on relative factor endowments while Krugman (1979) centralized product diversity and scale economies in his work on quantitative features.

However, the theoretical background behind the disintegration of IIT features has delayed until the 1990s.[19] The former researches (Falvey, 1981; Krugman, 1979) used on static approaches for examining IIT levels. Theoretically, the development of measuring IIT in both quantitative and qualitative is a difficult task without setting some dynamic assumptions. Essentially, regions with

[17] Greenaway, Hine, and Milner pointed out this development in NTT, in particular of useful equations in measuring IIT (Greenaway, Hine, Milner, 1994, 1995).

[18] GL index (Grubel and Lloyd, 1975), A index, B index and C measure (Brülhart, 1994), UMCIT index (Menon and Dixon, 1997), S index index (Azhar and Elliot, 2003) and MQ index (Azhar and Elliot, 2008).

[19] Abd-El Rahman (1991), Greenaway (1994, 1995), Fontagne and Freudenberg (1997), Fontagne, Freudenberg, and Peridy (1997) are pioneering frameworks as development in that subject.

similar income endowments maintain similar IIT shares in total trade. The underlying reason is that the snowball effect of product diversity and scale economics is quite important and should not be neglected. Respectively, the efficient scale of production causes greater industrial clusters for firms and eventually, a greater variety of products in the market leads higher magnitude of IIT. To examine snowball effects in IIT, literature was led to the development of the term, marginal IIT.

Fundamentally, marginal IIT also includes export and import trade actions of similar goods in diversified quality. Marginal IIT indexes are applied for conceptually more detailed processes in terms of adjustment pressures than the old school static indexes. In respect to quality-based IIT in dynamic form, endowment based models that build over Falvey's theory (Falvey, 1981) which widely explain the correlation between product quality and adjustment costs in labor market.[20] As an expected result by those models, EU core member countries[21] with capital abundance exports high-quality products and labor abundant newly become member countries focus on exporting low to middle-quality products. Therefore, marginal IIT with quality aspects arises in less crowded market structures with increasing rate of returns (Shakeed and Sutton, 1984).

Specifically, these endowment based models consider both sides of economic equilibrium. On the supply side, countries that specialize in various product

[20] Falvey developed a theoretical basis as numerous firms produce varieties of products with different qualities while having no increasing returns in production (Falvey, 1981). Falvey and Kierzkowski (1987), and Flom and Helpman (1987) contributed to literature by establishing their endowment based models on Falvey's previous model.

[21] EU founding forefathers in 1951; Germany, France, Italy, Belgium, Luxembourg, Netherlands.

quality levels are considered as having multiple factor endowments. Strictly speaking, higher capital to labor ratio in production provides a comparative advantage as a natural boost to those countries.

On demand side, relative incomes of consumers will determine the demand for goods with higher quality. Variation of per-capita income levels is predicted to be directly proportional to the share of higher-end quality products in bilateral trade. The production process of traded products is the main focus rather than the end-user characteristic in terms of quality levels of so-called products (Thom, McDowell, 1999 and Lloyd, MacLaren 2004). In this study, Marginal Quality (MQ) index is focused on various quality traded products in the same genre and a consistently controlled in within factor endowment model. Nonetheless, the inadequacy of factor endowment models was questioned by researchers at the beginning of the 1990s. In a more recent study, Clark and Stanley (2003), both country and industry level determinants are considered which influence ITT share of a country within a bilateral trade relationship with most developed nations. Contrary to expected predictions, a directly proportional relation with IIT share of a country and capital to labor ratio of its trading partner was observed. Particularly, factor endowment based explanation is not confirmed to their results. Moreover, they find no possible link between scale economies and IIT share in total trade. In this case, suggestively, the disaggregation of IIT is the more appropriate approach for measuring exact its weight in overall trade.

Alternatively, the conventional country-specific studies in the disintegration of IIT are focused on space-time analysis rather than factor endowment models. The structure of this analysis embodies on three different economic pillars,

export performance of a country, import capacity of a country and trade transaction costs which is mainly estimated by geographical distance and trade barriers.

Pioneering works of Isard (1954) and Tinbergen (1969) provided a suitable platform by adopting gravity model for robust empirical studies afterward. Isard introduced a model, Gravity Model of Trade (GMT), to reveal bilateral trade flows based on the economic capacities such as GDP analyses and geographic distance between pair countries. The basic form of this binary model with two countries;

$$F_{i,j} = G(M_i \,.\, M_j / D_{ij}) \qquad (1)$$

F is trade flow, M is the economic size of country i and j, D is the distance between them and G is the constant term. At the very beginning, GMT is needed to clarify and test economic and trade allegiances for countries in mega trade blocks. Additionally, Anderson (1979), Bergstrand (1993), Helpman (1987) was served to introduce a theoretical background for GMT. Haveman and Hummels (1996), and Deardoff (1998) presented a suitable model for describing bilateral trade among countries while testing and comparing trade location models. Their contributions are also crucial due to evolving gravity equation into reduced-forms for applying those in NEG models.

In an analyzed time periods, trend breaks highlight corresponding predictions of NEG theories. These predictions are satisfied for a country via agglomeration forces from the beginning of integration into trade unions. Eventually, the impact of integration proceeds beyond geographic barriers in real and labor markets. However, in this process, some regions have experienced higher IIT

growth rates rather than other counterparts of these trade unions. Quah (1997) observed this fact when comparing northern parts of EU and their Mediterranean counterparts. He found that geographical features carry a considerable impact on spatial inter-region spillovers. The spatial distributions of host and neighboring countries are compact with trade relations to create "growth clubs" for certain regions and ignore political borders.

Once this study presents its benchmark, the connection between IIT and adjustment pressures in EU can be descriptively measured. In addition to that, three dynamic issues are shed into light; first, the currently introduced W matrix using Euclid distance calculations provide more detailed information about regional weights. Further analysis based on this study can precisely reveal the "growth clubs" within EU. Secondly, the choice of the appropriate indexes in measuring IIT share is discussed on both conceptually and basis on empirical results. According to results, the marginal IIT indices work over relatively short-term time intervals are more useful in empirical analysis. Finally, the relative timing of free trade policies precede the situational changes in the labor market.

3. METHODOLOGY

Sectorial agglomeration levels in regions focus on impacts of externalities (as marginal IIT) in labor adjustment costs. Several methods are used to compute the marginal IIT share in total trade. In contemplation of this object, the spatial econometric techniques are applied to reveal adjustment implications in labor markets (Mora *et al*, 2006, Ezcurra *et al*, 2006, Mora and Moreno, 2010).

As mentioned before in literature review section, the cross-sectional data and short-time period panels are used to reveal the geographical contiguity of industrial agglomeration in European regions. However, these cross-analyses provide a singular point of view over IIT share of a single country. The fact is that newly become members of EU have problems with not only individual setbacks and debilitated infrastructure as regional backwardness's in trading with other members of EU. Consequently, EU members experienced that their trade performance falls dramatically with distance. EU officials took a step to overcome such a setback and promote the trade relations within EU-28. Regional trade mechanisms and economic cooperation have been accelerated since 1990, with the establishment of the Community Initiative (INTERREG). During INTERREG I (1990-1993) and II (1994-1999), the primary goal is to develop the economic performance of regions in peripheral border locations and ease their suffering trade performances (Mora, Garcia-Duran, Millet; 2011).

After a decade from the first INTERREG, Council of Europe has become an active pillar for providing a legal framework to establish stronger trade links between EU member countries. Providing economic, financial and legal support for trading initiatives were started to bear fruit since the 2000s. Since INTERREG III from 2002-2006, the greater attempts have been applied to promote territorial cohesion and with a snowball effect, the functional trade links are being strived from this policies. Moreover, in 2007, a six-year policy which is EU's Social Economic Cohesion Policy was applied to instrument further development of economic linkages (Barca Report, 2009).

The underpinning of splitting regions is a highlighted concern for EU already since the first INTERREG. The territorial cohesion has been identified

extensively to explore cross-regional effects on economic and social parts of European society (European Commission, 2008; Barca Report, 2009). EU officials focus on the collection of big data to compute the quantitative effects of their policies and they should overcome the shortcomings in monitoring EU economic and trade performance between its members (Mirwaldt, McMaster, and Bachtler, 2009). Also, these practices are required to distinguish regional production organizations[22] in similar industrial sectors with multiple brands and facilities.

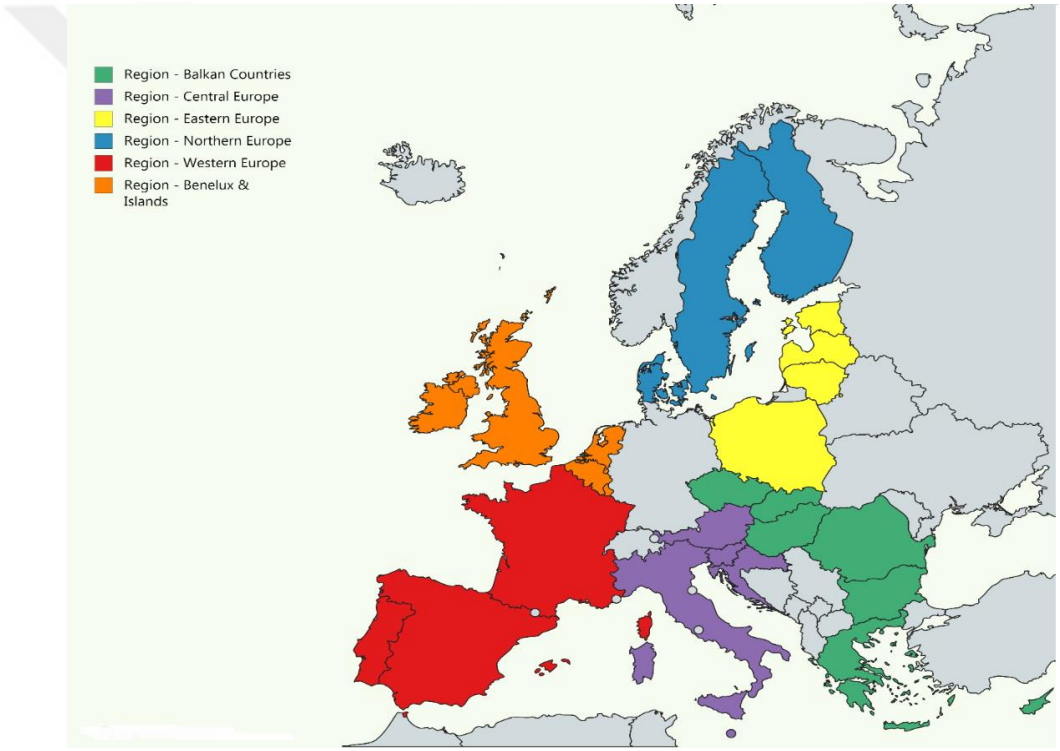

Figure 18. European Regions for EU-28 Countries

Note: Created by mapchart.net

[22] Assembly of European Wine Regions or Four Motors of Europe (Rhone-Alpes, Catalonia, Lombardy, Baden-Württemberg) are important examples. These interregional organizations with long trade relations between EU members developed a comprehensive trade volume especially in European Pentagon and Northern Europe (mostly Scandinavia). European Pentagon energy programme includes ten different companies from five countries which are UK, Switzerland, France, Italy and Belgium.

3.1. Dynamic Euclidean Distance Weight Matrix

In this paper, European regional agglomeration is examined by constructing so-called W matrix which is a new fashion spatial weight matrix. The examination of integration effects for countries in those regions is crucial to point out both neighboring and border effects. Arbia and Fingleton (2008) argued that the arbitrary selection of spatial weight matrices is crucial for empirical analyses. The overall regional impact on bilateral trade relations has to be solely examined before proceeding to measure IIT impact on adjustment costs. Therefore, the applied weight matrix must provide a mediocre restraint for estimating for regional impacts within member countries. Euclidean distance method captures sensitive impacts of spatial distribution over marginal IIT. By using Euclidean distance method, undertaking clusters within different EU regions (region A and B) should be properly diagnosed;

$$W_{\text{Euclidean}} = \sqrt{-x(a)^2 + y(b)^2 + z(c)^2} \quad (2)$$

The values of a, a, b and c are respectively here for a region. The weights of x, y and z are differentiated to avoid the modifiable areal unit problem[23]. The "x" equals to 0.25, as the multiplier of a; which stands for the distance between the capital city of the target country and German market (Berlin), in terms of kilometers. While moving farther the targeted market, trade costs are likely to increase and surpass IIT levels. Because of the inverse relationship between trade costs and IIT shares, x has a negative sign in the equation. The "y" equals

[23] Modifiable areal unit problem is a statistical bias that can hinder the results of empirical analysis. An aggregated results may vary under due to different selection of regions. To avoid such a problem, this paper follows INTERREG selection of EU regions. By considering this topic, researchers can avoid modifiable areal unit problem (Brülhart and Traeger, 2005). A selection of similar regional units of countries will overcome this problem in respect to robustness in the analysis.

to 0.25, as the multiplier of b which determines the length of the land border between target country and Germany, in terms of kilometers. In other words, it is the estimating parameter for the accessibility of a trade partner country products to the German market. Finally, the "z" equals to 0.50, as the multiplier of c; the population density in the target country, for 10.000 people.

The IIT flows contain the majority in bilateral trade between Germany and other 27 EU members. The unconventional way of measuring IIT levels by EU regions are crucial for mapping IIT trends within EU. In spite of having several EU regions with different characteristics, $W_{Euclidean}$ focus on three properties; trade costs[24], interdependence between trade partner countries and apparent consumption levels within those regions.

First and foremost, trade costs are not ignored while modeling the proportional impact of adjustment pressures and marginal IIT shares.[25] For the purpose of generating various testable hypotheses about trade costs and IIT shares, in 2006, Bergstrand and Egger demonstrated the explicit trade costs into the Helpman – Krugman IIT model.[26] Their model is implemented on cross-sections of bilateral trade flows across 31 countries for the time period 1990 to 2000. A reliable evidence is extracted from empirical results for an inverse proportion between trade costs and IIT percentage. The change in factor endowment levels is the main indicator of trade costs, and IIT levels are sensitively differed by various

[24] Generally speaking, in NEG literature, models that targeting to contrive cross-hauling IIT share ignore trade costs, except the distinctive study of Brander and Krugman (1983) which take "iceberg costs" into account.

[25] Trade costs are matter more than is generally assumed and should be treated more seriously in modeling (Anderson, and Van Wincoop 2004).

[26] See also Helpman – Krugman (1985)

homogeneous or differentiated products. In other words, different quantity and quality aspects of a wide range of products create their differentiated trade costs in industry sectors. The refinement of Helpman and Krugman model by Bergstrand and Egger (2006) to incorporate trade costs is a crucial milestone in relating trade costs and IIT. In this study, trade costs are evaluated by implementing geographical distance (x) in Euclidean spatial weight matrix as a new indicator.

Secondly, the density of interdependence (y) between member countries in different regions is examined under distance variable, b. Member countries are separated into two groups; border countries and inner countries. By following this approach the misinterpretation of interdependence factor is overcome. However, the border effect is expected to be low due to multifold trade and economic integration programs in EU. Researchers have also been concerned by practical applicants on specifying time periods of marginal IIT. This paper contemplates a fifteen yearlong panel data for providing a contribution to the debate over regional cohesion in EU.

Finally, population density (z) is taken into consideration for changes in apparent consumption and unemployment levels during transition periods of EU regions. Supposedly to Myrdal's vicious circle example (Mrydal, 1957), a contracting business in a region is neglected by policymakers and shut down. The crucial and immediate change of this situation is that labor force becomes unemployed[27]. Increasing unemployment causes deteriorated demand for both

[27] The curious case of Detroit is a fact from May 2001 after Dot.com bubble and four months before 9-11 crisis. While having a freefall in local businesses, Detroit experienced the most catastrophic unemployment levels in history. At its peak, unemployment in the city hit 28.4 percent in June 2009. Since then, a federally funded non-profit program targeted Detroit citizens and was able to drop unemployment at 8.5 percent. However, the decreasing population density

domestically produced products and imported ones. Eventually, the apparent consumption within the region will be crippled. If the population density high in that region, the decreased apparent consumption will cause higher substantial damage on IIT levels.

A circular causation from increasing unemployment and decreasing consumption, the community in that region will abandon their will to establish new businesses and order to seek another market for investing or working purposes. At the end, without any exogenous interventions, this causation further decreases consumption and unemployment levels skies rocket the unemployment levels into unfavorable levels.

3.2 Entropy Index

The current theoretical developments conduct distance to border-related weight measurement methods. Several rigorous hypotheses is tested for industrial activities in certain locations. As said before, economic activities that concentrated on specific regions is a subject of matter in spatial concentration. Spatially dispersed data have therefore examined for the industrial convergence with similar products. In this point of view, EU countries are heavily specialized rather than other parts of the world, although sectoral relocation is a slow pace (Overman et al, 2003).

Entropy index is applied to compare the Euclid distance spatial weight approach on the terms of industrial concentration in six EU regions. In literature, entropy indices have distinct advantages in empirical analysis, however, there is a scarcity in using these indices in spatial econometric models. Both of the indices

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and labor participation rate are uniformly important reasons behind that drop which is another story lurks under Detroit case.

for calculating spatial weights of industries have a common goal as to decompose the contribution of each industry sector in specific EU region. The observed locational concentrations are tested for statistical significances of these models with different indices to define employment data. The generalised entropy (GE) index is defined as (Brülhart and Traeger, 2005);

$$GE\ (\alpha)_s = \frac{1}{a^2 - \alpha}\left(\frac{1}{N}\sum_{n=1}^{N}\left(\frac{\bar{y}_{si}}{\bar{y}_s}\right)^{\alpha} - 1\right)$$

$$\bar{Y}_s = \frac{\bar{y}_{si}}{\bar{y}_s}$$

, where GE (α) stands for the weight given for Theil index of the geographic concentration level of an industry *i* in a region. The measured spatial weight is taken by geographic distances, and α weight has parameter value as 1. If α<1, greater weight is occurred at the dispersion of y_{si}, in the lower tail of the distribution and regarding α>1, greater weight is attributed at the dispersion of y_{si}, in the upper tail. An economic activity level is presented by spatial basic units, such as firms or countries, n = {1, 2,…,N}, and S is EU regions s = {1,2,..,6} in this case, regional economic activity of industry *i* in region S is $\bar{y}_{si}$. $\bar{Y}_s = \frac{\bar{y}_{si}}{\bar{y}_s}$ is the weight of economic activity ($\bar{y}_{si}$) for geographic concentration within the region and among overall regions ($\bar{y}_s$), respectively. By this illustration, GE formulization consists of periodical changes in $\bar{Y}_{si}$.

3.3. Measuring Marginal IIT

Regional agglomeration for European industries have previously assessed in several regional analysis (Hallet, 2002; Mora, et. al. 2006; Cutrini, 2010; Mora and Moreno, 2010). Various indices with alternative measures such

as cross-sectional, panel or econometric were used in these analyses. Initially, this paper provides a formidable weight matrix and spatial econometric model for measuring bilateral trade features for multi-regional trade relations. A priori that defines this empirical analysis is carefully chosen in relative merit to gathering results of marginal IIT between Germany and rest of EU-28 countries. In literature, there are still debates measuring dynamic features of IIT. This study questions several indices before jump into the applied methodology. At first, the semi-dynamic frameworks used the change in Grubel-Lloyd index (Grubel and Lloyd, 1975) and focused on dynamic shifts in IIT. However, using change in GL index (ΔGL) for determining IIT levels and its bound with lower adjustment costs can lead to potentially serious measurement error. Mainly because, the change in GL index might present a decaying position in the net-exporter area or closing a balance deficit in the same industry sector which is completely two opposing facts (Brülhart, 1994).

Static or semi-dynamic IIT models tell us agglomeration degree of a country at industry levels but cannot reveal in which industry sectors that a country specialized (Brülhart, 1998). Studies that using changes in GL index detect a negative correlation with a share of IIT in total trade and geographical distance of a country and her trading partners but almost all studies neglect to find an answer for "Which industries are focused and create clusters in central locations rather than peripheral rings?"

Melchior (1998) suggested an answer to this question. He identified a model of using his own calculations for measuring trade specialization. His index on bilateral trade flows of multiple EU countries from 1970 to 1992 and reveal

plausible points of NEG assumptions in sustained concentration in centrally located continental EU countries.

Despite the effort of Melchior, marginal IIT indexes are far more suitable for identifying net trade balance of trade actions with the same sign in all industry sub-sectors. According to a systematic link between marginal IIT indices and their subinterval components remains only if there is a dynamic involvement in either improvement or deterioration of net trade balance over industry sub-sectors. A generalized connection between marginal IIT results and industry sub-sectors could be made by continuous net improvements or deteriorations in the sectoral trade balance appear in different subintervals. In other words, generalization over determining bilateral trade series presents net year-on-year changes in sectoral trade flows of trade patterns while capturing dynamic "disjointedness" of marginal IIT indices (Brülhart, 2000).

Naturally, marginal IIT indexes have experienced a long journey in the theoretic base. At first, Greenaway and Milner (1986) argued on their resourceful survey of measurement tools for the state of IIT and Hamilton and Kniest (1991) provided an alternative evaluation of marginal IIT;

$$MIIT = \frac{Xt - Xt-1}{Mt - Mt-1} \text{ for } M_t - M_{t-1} > X_t - X_{t-1} > 0 \quad (3)$$

$$MIIT = \frac{Mt - Mt-1}{Xt - Xt-1} \quad \text{for } X_t - X_{t-1} > M_t - M_{t-1} > 0 \quad (4)$$

In addition to these developments in exploring marginal IIT, Greenaway (1994) identified another index for removing this measurement error;

$$\Delta IIT = \Delta [(X_i + M_i) - |X_i - M_i|] \quad (5)$$

However, Greenaway's contribution (eq. 4) does not permit to determine changes in relative values of IIT with respect to total trade between trade counterparts. During the same year, another marginal IIT index, A index was presented by Brülhart (1994);

$$A = 1 - \frac{|\Delta Xi - \Delta Mi|}{|\Delta Xi| - |\Delta Mi|} \qquad (6)$$

However, A index fails to capture changes in the absolute values of IIT along with changes in trade percentages. A decade later, Azhar and Elliot (2006) presented a study to overcome this short-handed index by suggesting product quality space (PQS) which is a geometric and visual tool used for mapping the features of IIT. PQS can be applied to deal with proportionality effects and provide useful visualization in measuring IIT. But, this innovation for empirical analysis is inadequate in the dynamic aspects of IIT because the results of PQS are static-based IIT shares in total trade.

Economic geography's top priority is the search of spatial distributions of economic activities. Using spatial dynamic econometric models are the proper approach in the lights of capturing the relation between marginal IIT levels and labor adjustment costs. By doing so, this study isolates the effect of marginal IIT shares on adjustment pressures by moving beyond singular bivariate relations while observing several crucial indicators in newly contributed weight matrix. In the second stage of this empirical analysis, the marginal IIT indices (S and MQ index) determine the bilateral trade impacts on labor adjustment costs[28]. Spatial inequalities between several EU regions are featured

[28] Several considerable considerations of selecting spatial indices in an empirical analysis are Combes and Overman (2004), Birkenbach and Bode (2008).

unambiguously by measuring exact regional weights. In any empirical analysis, the authors should take into consideration the features and availability of the data. Therefore, two different indices with two different focused features of marginal IIT are used to estimate adjustment costs in EU. In other words, the main goal is the examination of the aggregated level of IIT intensity in EU-28 region and trading trend of IIT was increased or not in the specific time period.

In general, marginal IIT results are generally designed for policy-relevant frameworks. An extracted empirical implementation should be complimented into political and practical relevance. Several practical issues are targeted by policymakers in economics matters. These economic matters could be gathered under three topics; choice of the level of sectorial disaggregation, weighting methods in summing results over base sectors and appropriateness of correction for aggregate trade imbalances. Greenaway and Milner (1986) comprehensively identified these topics in their study but undiscovered and intact empirical areas related to marginal IIT should be explicitly explored.

Dynamic features of IIT percentage in total trade can be estimated by determining four important assumptions. Respectively, those assumptions are monotonicity, consistency, specification, and identicalness. According to monotonicity, higher diversification in industry sectors reasons for more disruption in labor markets and creates higher unemployment rates. Consistency assumption presents the fact that, a change in factor reallocation requirements for production must be monitored in both trade partners. An expansion of an industry in a region will cause a contraction of the same industry in counterpart

regions. Regional specification of IIT levels provides results with higher understanding. For instance, a general demand trend on imported products can be tracked in specified results of IIT while diminishing demand trend on domestically produced similar products. Finally, in similar industry sectors, factor requirements for relative products are similar to each other. Any change in IIT shares can be examined solely in each individual industry sector.

The two different evaluation process of marginal IIT has been applied in this study for evaluating EU regions bilateral trade performances. S index is used for obtaining quantitative aspects of marginal IIT on labor market adjustment costs;

$$S = \frac{(\Delta X - \Delta M)t}{2\max\{I\Delta XI, I\Delta MI\}} = \frac{1}{2L}(\Delta X - \Delta M)t \qquad (7)$$

$$-1 \leq \text{S Index} \leq 1$$

ΔX_t and ΔM_t respectively equal to the differences between X_t and X_{t-1} and M_t and M_{t-1}. The time period, t is set for a period of years, i.e. for N years, t= (1, 2, 3…) while L is the estimator of the maximum amount of ΔX_t or ΔM_t. By adding L estimator, despite having static approaches (such as GL index), dynamic indices provide information about not only the beginning and end period but also the volatile changes in during these interactions. Each dynamic change in two-way trade trend is presented in the values between -1 and 1. As well as MQ index, S index provides a monotonically changing function of ΔX_t - ΔM_t, and applies specification and consistency assumptions of marginal IIT measurement. On the other hand, MQ index stands for;

$$MQ = \frac{\Delta UVIx - \Delta UVIm}{2[\max\{I\Delta UVIxI, I\Delta UVImI\}]} = \frac{1}{2L}(\Delta UVx - \Delta UVm)t \qquad (8)$$

$$-1 \leq \text{MQ Index} \leq 1$$

MQ index is similar to the calculation of S index however it focuses on the unit value of products UV_x and UV_m rather than quantity of products between the time period t. L denominates the maximum value of either ΔUV_{xt} or ΔUV_{mt}. The index results in subscripts the scaled maximum value of product quality for exported or imported products in the industry sector. The differentiated levels of product qualities can be addressed by this calculation. Both nature and magnitude of adjustment pressures in labor markets are seized by quality changes in products. In other words, MQ index measures on fragmentation in trade flow by analyzing the quality of traded products. It ranges from "-1 to 1", closer values to '1' present marginal IIT share majority over inter-industry trade in overall trade volume while '-1' identifies inter-industry trade concentration with higher adjustment costs in the process.

Table 7. NACE Code Categorization

Name / NACE Codes	Employment by sectors	Bilateral trade by sectors
Total Manu.	Total	Total
Agriculture-Based Manu.	1+2+3+8+9	1+2+5
Mining-Based Manu.	4+5+6+7	3+4
Chemical-Based Manu.	16+17+18+19	6
Metal-Based Manu.	20+21+22	7
Machinery-Based Manu.	23+24+25	8
Other Articles Manu.	10+11+12+13+14+15+26	9+10

The NACE code categorization is used to overcome the measurement problems with the definition of industry-specific features. Trade and employment data were derived from Eurostat. The hypothesis of this model consists of spatial distributions on marginal IIT level have an inverse relation with adjustment pressures in domestic labor markets. Particularly, the spatial effects of a trade union (EU in this case) are examined in terms of adjustment pressures in

geographic dimensions through the specific time period. As mentioned before, the subjected geographic dimensions are determined by territorial cohesion and discussed spatial distributions are observed from the official application of Euro in 2002 to available latest data in 2016. For display measures, both marginal IIT shares of total industry are given below while remaining six main industry marginal IIT levels are used in the econometric model as the independent variable.

The results of marginal IIT in table 3. are gathered in two distinctive branches; quantity features are available under S index while MQ index reveals quality features of ongoing IIT shares for each country in six EU regions. The IIT shares of EU members in bilateral trade with Germany are solely examined without having so-called Euclidean distance spatial weights.

From 2002 to 2009, except some countries, Slovakia and Bulgaria in Balkans region, overall member countries experienced an increase on the frontier of quantity features in marginal IIT. In addition to that, all of these countries enjoyed a substantial development in their quality of products as can be seen as promising results on MQ index. In summary, a 15.92% of increased trade amount was followed by 20.52% rise in quality of products and encouraged EU member countries to accelerate their trade performances in future.

In spite of being on a good track, the developing shares of marginal IIT experienced a turndown in 2009 at the peak of Bubble Crisis in 2009. All the advancement toward bilateral trade turned down and industries in EU regions started to lose ground in bilateral trade in both quantity and quality aspects. S and MQ indices show the diminishing side of marginal IIT in numbers. Respectively, the quantity of products decreased by 4.28% percent on overall

regions while product quality took a bigger hit around 11.73%. Strictly speaking, the flourishing EU industries faced a dispersion. As mentioned in chapter 1 of this dissertation, unemployment problems of EU countries surged into massive amounts in that time period. As can be recognized in table 2, the impact of distance to EU single market led countries into vulnerable positions at the time of external turbulent such as financial crisis.

Table 8. Changes in MIIT for Total Products between EU-27 and Germany

Region	Country	2002 to 2009		2010 to 2016		Distance to German Market* (km)	Border to Germany**
		Delta S Index	Delta MQ Index	Delta S Index	Delta MQ Index		
Central Europe	**Austria**	8,71	17,56	-18,64	-47,69	492,7	**Yes**
	Slovenia	17,90	19,62	0,06	-6,07	671,96	No
	Italy	8,62	24,23	0,86	-4,44	1225,09	No
	Croatia	42,83	30,02	-40,86	-9,75	801,05	No
	Malta	-3,77	17,44	3,36	-5,73	1892,37	No
Western Europe	**France**	0,30	21,59	1,55	-0,18	905,23	**Yes**
	Spain	26,33	23,96	0,48	-4,69	1869	No
	Portugal	61,03	25,22	-3,35	-24,52	2069,79	No
Benelux & Islands	**Belgium*** **	-0,01	10,13	-0,78	-11,36	670,88	**Yes**
	Netherlands	19,12	16,23	-18,14	-0,30	582,23	**Yes**
	UK	46,56	23,46	5,88	-10,51	941,92	No
	Ireland	25,41	34,94	4,02	-8,70	1331,59	No
Northern Europe	**Denmark**	4,63	16,27	-19,02	-16,08	338,14	**Yes**
	Sweden	28,34	20,99	-1,28	-8,18	831,45	No
	Finland	46,73	24,10	-1,42	-17,03	1139,33	No
Eastern Europe	**Poland**	11,59	20,36	0,73	-4,64	520,54	**Yes**
	Estonia	2,76	10,19	12,44	3,78	1054	No
	Latvia	22,46	23,57	1,11	-7,06	827,45	No
	Lithuania	32,35	27,22	-1,67	-31,80	824,05	No
Balkans	**Czech Republic**	0,08	15,29	0,26	-3,39	233,83	**Yes**
	Slovakia	-26,67	15,39	-2,00	-12,75	517,4	No
	Hungary	-3,69	10,03	0,34	-3,60	688,55	No
	Romania	2,90	14,68	0,04	-10,99	1294,23	No
	Bulgaria	-19,35	20,23	2,57	-10,78	1339,72	No
	Greece	30,23	24,09	-34,92	-12,31	1853,74	No
	Cyprus	28,59	26,82	-2,86	-36,14	2467,04	No

Average EU -27	**15,92%**	**20,52%**	**-4,28%**	**-11,73%**

3.4. Home Market Effect

The home market effect is seized by all three models in spatial economics with different perspectives. In neo-classical theories with no trade costs, factor endowments and spatial distribution of apparent demand in domestic market incline industries to agglomerates in certain locations. Besides that, there is no correlation between demand shares and production shares. On the other hand, when we add trade costs in neo-classical theory, high demand for a product attracts production motives in that particular region, positive correlation between demand shares and production shares. But it may lead to the high motivation for import of a specific good. The scenario which ends up with a country becomes a net-importer of that product and increasing adjustment costs.

NTT has comparatively high-demand shares for increasing returns to scale and attract more production with an elevation of net exports of these goods (Krugman, 1980; Weder, 1995). The relevant demand for a single product is determined by both domestic and foreign demand for that particular product. The significance level of relevant demand falls with increasing geographical distances (Davis and Weinstein, 1997). An approach that carries Gravity model assumptions as weighting is quite appropriate to assess relevant demand for products.

Industrial sectors can be observed with home-market effect and increasing returns to scale point of view. Increasing return paradigm is widely accepted to capture demand idiosyncrasies. More than the proportional size of domestic production to market size also applies to a NEG models. According to NEG

models, Euclidean weighted W matrix approach captures the most concrete parameters for apparent demand in empirical analysis.

3.5. Spatial Econometric Model

Spatial panel data refers to values of numerous spatial units (regions, states, jurisdictions, countries, continents etc.) via time series observations. Spatial econometrics can focus extensive modeling possibilities rather than cross-sectional setting. Panel data is used in this study because it is generally more informative while containing more variations and less collinearity among numerous variables. These three effects generally increase the overall efficiency of the estimation by improving the availability of degrees of freedom. In addition to those outcomes, panel data also allows more complicated behavioral hypotheses to be computed and specified (Hsiao, 2005).

Spatial structures of country-specific data in European regions are used to provide an integrated research for measuring trade induced adjustment in the labor markets. A negative sign in marginal IIT variables (S index and MQ index) is accepted as a sign that expanding domestic industries in EU regions match the export and import challenges in their domestic markets. Otherwise negative outcomes present contracting domestic industries with higher levels of adjustment problems by becoming a member of EU in terms of bilateral trade.

As in comprehensive work of Cabral and Silva (2006), their investigation reached significant results on Portuguese employer-employee dataset that covers domestic labor market trends. Estimation on adjustment pressures is examined by applying the spatial econometric model and dynamic changes in marginal IIT. Their findings clearly submit the correlation between low adjustment costs and IIT rather than inter-industry trade activities.

Patterns of bilateral trade data is an indicator of specialization trends in production. In other words, annually or quarterly trade data is used as an appropriate measure. Therefore, location patterns in industry sectors are examined via quantitative data on employment or production output levels. Especially export data are used as a proxy for production levels and according to our main assumption, trade concentration is almost same between similar industry sectors.

The features of marginal IIT are used as well as the conventional and static IIT measurements. In consideration, recent research methods suggest that the former is more appropriate for mapping the adjustment issues in labor market. The general specification for the spatial panel data model is;

$$Y_{it} = \tau Y_{it-1} + \rho W Y_{it} + X_{it}\beta + D Z_{it}\,\theta + \alpha_i + \gamma_t + \varepsilon_{it} \quad (8)$$

$$\varepsilon_{it} = \lambda E v_{it} + u_{it} \quad (9)$$

$\mathbf{Y_{it}}$ is an observation on the dependent variable at i and t, $\boldsymbol{\tau}$ parameter value for lagged values of dependent variable, $\mathbf{X_{it}}$ is an (1, K) row vector of observations on the independent variables, $\mathbf{Z_{it}}$ is spatially lagged regressor, $\boldsymbol{\alpha_i}$ is the individual fixed or random effect (spatial specific effect), $\boldsymbol{\varepsilon_{it}}$ is an independently and identically distributed error term for industry i and time period t, with zero mean and variance σ^2, $\boldsymbol{\lambda E v_{it}}$ is spatial random effects on error term, $\mathbf{u_{it}}$ is normally distributed error term, $\boldsymbol{\gamma_t}$ is the time effect, **W** is the spatial matrix for the autoregressive component, **D** is the spatial matrix for the idiosyncratic error component, $\boldsymbol{\theta}$ is the parameter value for spatially lagged regressors, an index for

the cross-sectional dimension spatial units is presented as **i** where i=1,…., N, finally **t** stands for the time dimension (time periods) t=1,….,T.

Spatial autoregressive models (SAR) posit to observe a set of local characteristics in neighboring regions. A notable study of Brueckner, an interaction between neighboring jurisdictions in terms of taxation and public expenditure is examined in empirical analysis. In his study, about the "strategic interaction among local governments", the SAR models are theoretically consistent with the spatial distribution (Brueckner, 2003). The similar model of Brueckner's is used as a spatial autoregressive model to capture neighboring effects on IIT levels within EU regions by adding random effects and trade weight for the particular regions. Random effects are measured with linear unbiased predictions and for varying the regional trade value of Euclidean weight for different regions. The model is presented as;

$$Empe_{i,t} = \alpha + \rho.W.Empe_{i,t-1} + \beta_2(W)S_{index} + \beta_3(W)MQ_{index}$$

$$+ \beta_4 Distance + \beta_5 \mu + \varepsilon_{i,t} \qquad (10)$$

$$\varepsilon_{i,t} = \rho.W.\ \varepsilon_{i,t-1} + \upsilon_{i,} \qquad (11)$$

Where ρ stands for the density of labor force in country i as a spatial autoregressive coefficient and $W_{Euclidean}$, spatial Euclid distance weight matrix is estimated as a spatial lag variable.

4. EMPIRICAL RESULTS

Studies on IIT concentration produces tremendous materials for us to surpass neo-classical frameworks and provides solid theoretical ground for NEG and further researches. General acceptance includes the main assumption,

growing share of IIT relates inversely to trade costs. However, a respectable amount of NEG models strongly disagree with that assumption. According to Brülhart (1998), re-dispersion of a single industrial activity below a critical threshold of trade costs and implicitly sustained IIT even at very low trade costs (Brülhart, 1998). Moreover, among trade union members, re-dispersion and low adjustment costs should be accepted as highly approximation of agglomeration process, likewise, that explained in "u curve" theorem (Krugman and Venables, 1995; Puga and Venables, 1997).

Table 9. Results of DEDSP

Dynamic Euclid Distance Spatial Panel (DEDSP):
Random effects spatial two-stage least squares (RES2SLS)
SAR = spanel (id, time, W, y, X)
Applying W Euclid Distance Weight
Matrix and Generalised Entropy
N = 2730 n = 182 T = 15 | Balanced Panel

	Euclid Distance Weight Matrix (w)				Generalised Entropy - GE (α)			
Empe	Coef.	Std. Error	z-stat	p-value	Coef.	Std. Error	z-stat	p-value
S index	-0,0299	0,0156	-1,9158	0,055 *	-0,0223	0,0132	-1,6886	0,091 *
MQ index	-0,0417	0,0134	-3,1051	0,002 ***	-0,0047	0,0115	-0,4111	0,681
Home Market	-0,4896	0,2014	-2,4306	0,015 **	-0,0488	0,0203	-2,3967	0,017 **
Constant	3,4392	0,5980	5,751	0.000 ***	0,1311	0,0605	2,1662	0,030 **
R-squared	0.02546				0,00392			
RSS	1963,93				182,660			
Wald Chi2(3)	15,6372				10,7397			
p-value	0.0013 ***				0,0132 **			
sigma_v	0.28734				0,25944			
sigma_1	0.64931				0,06518			
theta	0.88573				0			

The results in table 3 are addressed in empirical analysis, where the trend of marginal IIT for becoming members of EU is examined in 26 countries[29] for six main industry sectors over the 2002 to 2016 period. According to NEG, it is clear that IIT shares are determined scale-intensive groups of industries. The analysis focuses on bilateral trade relation between high scale-sensitive German industries at the center and other industries in EU-28 member countries in dispersed regions. Results solidify supportive arguments for theoretical pillars of NEG and present the seriousness of selection for cross-sectional dispersion in regions. Given the importance of results, quantity and quality aspects of marginal IIT are inversely related to unemployment changes in industry sectors. Both indices, S index, and MQ index are statistically important at 10% and 1% respectively in Euclid distance spatial weight model while GE fails to decompose the quantity and quality aspects of marginal IIT in EU regions. Although expected negative signs are covered by both weight calculation methods, only trade volume as S index is observed statistically significant in GE approach.

Besides of insufficiency in neo-classical models, home-market effects and core-periphery trade scales are better at providing satisfactory explanations on observed agglomeration processes in member countries. Home-market effect via distance factor is also inversely related to employment changes in industry sectors. In other words, while the distance increases between trade partners, the adjustment pressures widens in labor market. Both weight matrix approach

[29] Belgium and Luxembourg is admitted as a single country.

supports that theory with findings of econometrically significant at 5% confidence level.

The main expansion in IIT since the 1980s is happened because of increasing percentage of high-end quality products (Fontagne, Freudenberg, and Gaulier, 2006). A first systematic decomposition of international trade flows in both quantitative and qualitative features covers 5.000 products and modeling this ambitious effort on bilateral trade flows in general scale. They show the highest share of most of IIT is between as two-way trade in OECD country pairs and most of it's in high quality manufactured products. Another important result they reached is the elevating level of globalization in the beginning of 1990s is the main catalyzer of increased IIT shares.

This results also show high resemblance with former studies that found the fact is the quality based IIT overruns quantity based IIT[30]. Empirical researches in following papers Murshed (2001), Blanes and Martin-Montaner (2006), Faustino and Leitao (2007) announced that impacts of quality of products dominate the amount of exported products in the bilateral trade relationship. However, Euclidean approach accomplishes to capture the inverse relation with quantity-based marginal IIT and adjustment pressures while GE lacks to reveal any relation at all.

This comprehensive and coherent study might reveal that MQ index inversely affects the adjustment costs in the same industry as twice as S index impacts. In

[30] The distinction between quality and quantity of products in bilateral trade between mega trade agreements has become increasingly important in empirical studies. Clark (2006), Wakasugi (2007), Leitao, Faustino and Yoshida (2010) highlighted the relevant fragmentation levels for reflecting bilateral trade impacts on different stages of production. The exchange of intermediate products in such cases is significant in terms of relative factor endowments.

other words, the quality of products is more attractive for German consumers toward foreign EU products rather than the quantity of product available. The labor-intensive industries consisted of diversified products generate increasing IIT trends in bilateral trade. Scale-sensitive industries at the core, labor-intensive industries locate themselves in peripheral regions. Thus, results reveal that the considerations on factor adjustment costs are likely to overcome increasing returns to scale. In the process of EU integration, member country locations play a determinant role in industrial agglomeration processes. Furthermore, recently becoming member countries that located at periphery ring have less industrial agglomeration due to geographical distances.

5. CONCLUSION

Industry agglomeration in developing countries is a real and important fact that it cannot be identified by only plant numbers but also the quality of the products that produced by those plants. Spatial distribution tends to be more solid in localized in regions such as in the comparison of clustering pattern, on core EU countries with trade surplus have highly agglomerated industrial sectors than periphery countries with debilitated trade infrastructure. In addition, the sectoral dispersion is a fact that limits the expansion of concentration on the international economic scale while periphery countries experience growing IIT rates.

This results provide compelling corroboration of main paradigms (such as monotonicity) and present industrial specialization trends in a dynamic IIT sense. Both net trade changes and product quality differentiation are examined in terms of industrial agglomeration, geographic locations (by six different EU

regions) and economics of scale. A significant inverse relation is found between MIIT and adjustment pressures in labor markets. Regions with more concentrated trade activities do not suffer the harmful effects of geographical distances. Recent trading from two different time periods presents that EU regions were targeted by dispersion or concentration in industry sectors. In first seven-year period from 2002 to 2009, EU industries flourished via IIT. However, continuing time period from 2010 to 2016 reveals sectorial developments in concentration were in jeopardy. Furthermore, this jeopardized situation might relegate the agglomeration phase of a member country in EU region. Analyses of integrated trade and production data must be applied to obtain specialization trends of this part of the world.

The burdens of transitional periods for member countries should be eased by addressing spatial economic disparities correctly. Integration mechanisms within EU are the most appropriate solution for developing bilateral trade relations in both frontiers; quantity and quality based products. Furthermore, the evolution of the spatial economy should be achieved by entrenching sub-regional spatial disparities. The elimination of zero-sum competition in trade relations accompanies greater serenity over adjustment pressures in labor markets. However, promoting localism against globalization will discard development of bilateral trade and drag labor markets in dispersions rather than agglomerations. More broadly, new fiscal policies of EU should conduct on various solutions for this problematic behavior.

Yet, the literature still provides a broad scope for bountiful extensions. Migration flows in a current decade can be accepted as a replica of migration

fractions of experience in the late 19th century, these flows have gained importance by stimulating trade trends between emigrated and immigrated countries. A pioneering study of Blanes and Martin-Montaner (2006) demonstrate a new literature on migration networks and trade relations which suggest the increasing presence of an immigrant population in the total demographic platform has a positive impact on total trade. Their study concentrated on linking immigrant characteristics with IIT share of Spanish industries. Focusing on non-EU workers, Blanes and Martin-Montaner investigate their indicators such as managerial initiatives, the power of self-employment and involvement in service delivery. Their results show that networks are more complex and disputable than basic analyses because of using very detailed individual level of datasets.

At the end, any further empirical research should focus on free movement of labor in terms of migration and the choice of the time interval for measuring MIIT should be our next topics in NEG to examine in further researches. In other words, economic geography literature still does not provide a general framework or applicable index with feasible assumptions.

APPENDIX

Correspondence Table

Employment (Nace 1.1)	Employment (Nace 2.1)
1	1
2	2
3	3
4	4
5	5
6+7	6
8	7+8
9	9+10
10	11
11	12
12	13
13	14
14	15
15	16
16	17
17	18
18	19+20
19	21
20	22
21	23
22	24
23	27
24+25+26+27	25+26
28	28
29	29
30	30

Countries trading with Germany	id
Austria	AUS
Belgium & Luxembourg	BEL
Bulgaria	BUL
Croatia	CRO
Cyprus	CYP
Czech Rep.	CZC
Denmark	DEN
Estonia	EST
Finland	FIN
France	FRA
Greece	GRE
Hungary	HUN
Ireland	IRE
Italy	ITA
Latvia	LAT
Lithuania	LTH
Malta	MAL
Netherlands	NET
Poland	POL
Portugal	POR
Romania	ROM
Slovakia	SLO
Slovenia	SLV
Spain	SPA
Sweden	SWE
UK	UK

Central Europe: Austria, Slovenia, Italy, Croatia, Malta

Western Europe: France, Spain, Portugal

Benelux & Island Europe: Belgium & Luxembourg, Netherlands, UK, Ireland

Northern Europe: Denmark, Sweden, Finland

Eastern Europe: Poland, Estonia, Latvia, Lithuania

Balkans: Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Greece, Cyprus

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