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國際學碩士學位論文

**The Effect of Aid for Trade on Export  
Diversification of the Recipient Countries**

貿易을 위한 援助가  
受援國의 輸出 多邊化에 미치는 影響

2012年 8月

서울大學校 國際大學院

國際學科 國際協力專攻

金 有 梨



**Master's Thesis**

**The Effect of Aid for Trade on Export  
Diversification of the Recipient Countries**

**August 2012**

**Graduate School of International Studies**

**Seoul National University**

**Department of International Studies**

**International Cooperation Major**

**Yu Ri Kim**



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委 員 長 \_\_\_\_\_ 李 根



副 委 員 長 \_\_\_\_\_ 金 泰 均



委 員 \_\_\_\_\_ 金 鍾 燮



# The Effect of Aid for Trade on Export Diversification of the Recipient Countries

Thesis Advisor Chong-Sup Kim

Submitting a master's thesis of International Studies

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Graduate School of International Studies,

Seoul National University

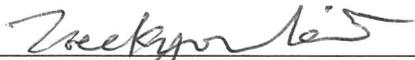
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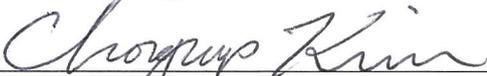
Yu Ri Kim

Confirming the master's thesis written by Yu Ri Kim

August 2012

Chair   
Geun Lee

Vice Chair   
Taekyoon Kim

Examiner   
Chong-Sup Kim

## **Abstract**

The importance of Aid for Trade (AfT) as a useful tool for facilitating trade, economic growth and social development has come to light since it was invented in Hong Kong Ministerial meeting in 2005. Although AfT draws attention of many scholars and development stakeholders and has produced some literatures investigating the relationship between aid for trade and trade expansion, there are not many efforts to measure the effect of aid for trade on export diversification. This paper, therefore, attempts to dissect the expansion of export into two parts using extensive margin (EM) and intensive margin (IM) and traces the correlation between aid for trade and extensive margin which particularly measures the variety of export commodities. Since aid receiving countries are a highly diverse group with different economic situations, regression is run separately for each income group. Overall, aid for trade appears to be effective in diversifying exports from 2002 to 2009. The pooled regression suggests that countries receiving more aid for trade increase both their extensive and intensive margin in the following year, regardless of their income level. Cross-section fixed effects regression, on the other hand, shows varying result depending on the income group, aid type and aid sector.

**Keywords: aid for trade, export diversification, aid effectiveness, extensive margin, intensive margin**

## Table of Contents

|   |    |
|---|----|
| Abstract .....  | i  |
| Table of Contents .....                                   | ii |
| List of Tables .....                                      | iv |
| List of Figures .....                                     | v  |
| 1. Introduction .....                                     | 1  |
| 2. What is Aid for Trade?.....                            | 3  |
| (1) Origin.....   | 3  |
| (2) Definition and Scope .....                            | 4  |
| (3) Recent Trends .....                                   | 5  |
| (4) Policy Objectives.....                                | 18 |
| (5) Evolution and Evaluation of Aid for Trade .....       | 22 |
| 3. Literature Review.....                                 | 25 |
| (1) Export and Economic Growth .....                      | 25 |
| (2) Aid and Export Growth .....                           | 27 |
| (3) Effectiveness of Aid for Trade .....                  | 27 |
| (4) Export Diversification and Economic Growth .....      | 28 |
| (5) Aid for Trade and Export Diversification.....         | 29 |
| 4. Model and Methodology .....                            | 32 |
| (1) Extensive Margin (EM) and Intensive Margin (IM) ..... | 32 |
| (2) Estimation Model .....                                | 40 |
| 5. Empirical Results .....                                | 48 |

|   |    |
|---|----|
| (1) Pooled Regression .....                                       | 48 |
| (2) Cross-section fixed effects .....                             | 49 |
| 6. Conclusion .....   | 61 |
| Bibliography.....   | 63 |
| Appendix A. List of Countries by Income Group.....                | 67 |
| Appendix B. List of OECD CRS Purpose Codes for Aid for Trade..... | 69 |
| Korean Abstract (국문 초록).....                                      | 75 |

## List of Tables

|  |    |
|--|----|
| Table 1: Average Aid for Trade Received by Income Group (2002-2010) .....  | 15 |
| Table 2: Results of Selected Studies Linking Exports and Economic Growth .....   | 26 |
| Table 3: Average of Standard Deviation of Countries' EM and IM by Income Group (2002-2010).....                              | 40 |
| Table 4: Correlation between Aid for Trade Value and Average of EM/IM by Income Group (2002-2010) .....                      | 40 |
| Table 5: Variables Used in the Model.....  | 44 |
| Table 6: The Impact of AfT on EM and IM in Pooled Regression (2002-2009).....  | 49 |
| Table 7: The Impact of AfT on EM and IM with Cross-Section Fixed Effects (2002-2009) .....                                   | 50 |
| Table 8: The Impact of Aid for Infrastructure on EM and IM with Cross-Section Fixed Effects (2002-2009) .....                | 52 |
| Table 9: The Impact of Aid for Building Productive Capacity on EM and IM with Cross-Section Fixed Effects (2002-2009) .....  | 53 |
| Table 10: The Impact of Aid for Trade Policy and Regulations on EM and IM with Cross-Section Fixed Effects (2002-2009) ..... | 54 |
| Table 11: The Impact of AfT in the Form of Grant on EM and IM with Cross-Section Fixed Effects (2002-2009) .....             | 55 |
| Table 12: The Impact of AfT in the Form of Loan on EM and IM with Cross-Section Fixed Effects (2002-2009) .....              | 56 |
| Table 13: The Impact of Other Official Flows in AfT Sectors on EM and IM with Cross-Section Fixed Effects (2002-2009) .....  | 57 |
| Table 14: Summary of Regression Results .....  | 58 |

## List of Figures

|   |    |
|---|----|
| Figure 1: Total Aid for Trade Flow as % of Total Aid (1973-2010) .....  | 6  |
| Figure 2: Aid for Trade Disbursed by Sector (2002-2010) .....   | 7  |
| Figure 3: Aid for Trade Disbursed by Type (2002-2010) .....   | 9  |
| Figure 4: Top 15 Bilateral Donors (2006-2010) .....   | 10 |
| Figure 5: Top 10 Multilateral Donors (2006-2010) .....  | 11 |
| Figure 6: Top 15 Recipients (2006-2010) .....   | 12 |
| Figure 7: Share of World Export by Income Group (1995-2010) .....   | 14 |
| Figure 8: Aid for Trade (excluding OOF) Received by Income Group (2002-2010) .....                              | 16 |
| Figure 9: Aid for Trade (including OOF) Received by Income Group (2002-2010) .....                              | 16 |
| Figure 10: Total Aid Received by Income Group .....   | 17 |
| Figure 11: Aid for Trade Received by Income Group and by Sector .....   | 18 |
| Figure 12: Main Goals Recipients Want to Achieve through Aid for Trade .....                                    | 19 |
| Figure 13: Share of Selected Low Income Countries' Top Three Commodities in Their<br>Total Exports (2010) ..... | 20 |
| Figure 14: Main Goals Donors Want to Achieve through Aid for Trade .....  | 21 |
| Figure 15: Who Monitors Aid for Trade Programs and Projects .....   | 22 |
| Figure 16: Scattered Plot of Log of GDP per Capita and Extensive Margin of All<br>Countries (2002-2010) .....   | 33 |
| Figure 17: Average of EM by Income Group (2002-2010) .....  | 33 |
| Figure 18: EM of Low Income Countries (2002-2010) .....   | 34 |
| Figure 19: Standard Deviation of EM of Low Income Countries (2002-2010) .....                                   | 34 |
| Figure 20: EM of Lower Middle Income Countries (2002-2010) .....  | 35 |

|   |    |
|---|----|
| Figure 21: Standard Deviation of EM of Lower Middle Income Countries (2002-2010)                      | 36 |
| Figure 22: EM of Upper Middle Income Countries (2002-2010).....                                       | 37 |
| Figure 23: Standard Deviation of EM Upper Middle Income Countries (2002-2010).....                    | 37 |
| Figure 24: EM of High Income OECD Countries (2002-2010).....  | 38 |
| Figure 25: Standard Deviation of EM of High Income OECD Countries (2002-2010) ...                     | 38 |
| Figure 26: Scattered Plot of Log of GDP and Log of Intensive Margin of All Countries (2002-2010)..... | 39 |
| Figure 27: Scattered Plot of Log of Aid for Trade and Extensive Margin (2002-2009)...                 | 41 |
| Figure 28: Scattered Plot of Log of Aid for Trade and Intensive Margin (2002-2009)....                | 42 |
| Figure 29: Scattered Plot of Log of Aid for Trade and Log of Intensive Margin (2002-2009) .....       | 42 |

## **1. Introduction**

Aid for Trade (AfT) denotes a type of development assistance that is intended to promote trade of developing countries which are faced with many challenges in the global trade regime. It is expected that Aid for Trade provides a basis for economic growth and social development based on expansion of international trade. The concept was first introduced in the Hong Kong Ministerial Meeting in 2005. The objective of AfT stated by the final Hong Kong Ministerial Declaration is to assist developing countries, especially Least Developing Countries (LDCs), to “build the supply-side capacity and trade-related infrastructure that they need to assist them to implement and benefit from World Trade Organization (WTO) Agreements and more broadly expand their trade” (WTO, 2005, para. 57).

Even though the role of AfT is emphasized over time, there have not been many papers measuring the effectiveness of AfT on trade performance. Also, existing papers which attempt to examine the impact of AfT focus only on the bilateral flows between donors and recipients but do not look at the effect of AfT on the total flows from each recipient to the world. It is partly because the scope of Aid for Trade has continued to evolve since the early 2000s, and partly because AfT data with sufficient quality and time length is not available. More importantly, most of papers simply use export volume as the dependent variable to quantify the effect of AfT. Yet, sheer increase of export volume may not necessarily lead to the development of one nation, and thus, should not be used as the sole measure for the effectiveness of AfT.

This paper, therefore, aims to investigate the effectiveness of AfT using export product diversification as the index.<sup>1</sup> There is still great scope, however, to intensify the process, and in particular to further diversify at the product level. Using a sample of 117 recipient countries between 2002 and 2009, a panel regression will show the causal relationship between AfT and export diversification of recipient countries. Among some studies analyzing the effect of AfT on trade, research on the impact of AfT on diversifying recipients' export is far more scant. The attempt to analyze the AfT effectiveness on the export diversification is meaningful in the sense that it can distinguish export increase into increase in type of commodities and increase in export volume of existing commodities. In order to account for the endogeneity problem, the paper uses time-lead measures of extensive and intensive margin as dependent variables. In addition, AfT is broken down by sectors (economic infrastructure, building productive capacity, and trade policy and regulations) and types (grant, loan and other official flows). Also the impact of these different categories of aid for trade on different income group is analyzed.

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<sup>1</sup> It is equally important to diversify the export markets but diversifying market largely depends on the demand condition of other countries which are hard to control by exporters. Moreover, the process of market diversification is already under way with the rise of developing countries and South-South trade (World Bank, 2011). Therefore, this paper will only focus on product diversification and diversification hereafter means product diversification.

## **2. What is Aid for Trade?**

### **(1) Origin**

As more than two thirds of WTO members are developing countries, their concerns regarding trade issues are more incorporated in the WTO system. WTO claims that its agreements recognize the link between trade and development so that WTO agreements contain special provisions in favor of developing countries. Generalized System of Preferences (GSP) is an example of such preferential measures for least developed countries.

Doha Development Agenda (DDA) which was launched at the Doha Ministerial Conference, in November 2001, has placed development issues and the interests of developing countries at the heart of the WTO's work. Still, DDA mostly dealt with export barrier on the demand side such as eliminating tariff and non-tariff barriers. Many developing countries were still expressing their concerns over lack of capacities to implement such agreements and implementing trade-related adjustments while faced with supply-side challenges such as poor infrastructure, lack of capacity and knowledge and scarce capital.

Therefore, during the Sixth WTO Ministerial Conference held in Hong Kong, China, in 2005, the importance of tackling such internal constraints was further highlighted. As a result, the Sixth WTO Ministerial Declaration initiated Aid for Trade and set up the Task Force to operationalize the concept. Along with the WTO's effort,

United Nations committed to the AfT initiative since the 2005 World Summit Outcome and have pursued implementation of AfT initiative.

## **(2) Definition and Scope**

To examine the exact effect of AfT and interpret the result with accuracy, it is required to understand the category of AfT and purpose of each sub-category in the AfT dataset. Based on Commonwealth Secretariat in March 2006 (WTO, 2006, 2), the WTO Aid for Trade Task Force identified the following six policy areas for aid for trade assistance.

1. Trade policy and regulations
2. Trade development
3. Trade-related infrastructure
4. Building productive capacity
5. Trade-related adjustment and
6. Other trade-related needs

The Task Force also recommended the following as the objectives of aid for trade initiative.

- To enable developing countries, particularly LDCs, to use trade more effectively to promote growth, development and poverty reduction, and to achieve their development objectives, including the Millennium Development Goals (MDGs).
- To help developing countries, particularly LDCs, to build supply-side capacity and trade-related infrastructure in order to facilitate their access to markets and to export more.
- To help facilitate, implement, and adjust to trade reform and liberalization.
- To assist regional integration.
- To assist smooth integration into the world trading system.
- To assist in implementation of trade agreements.

However, there must be a concrete boundary specifying what qualifies as aid for trade for the analytic purpose. Here, it may be useful to use the purpose coding system of the Creditor Reporting System (CRS) which was jointly produced by Organisation for Economic Co-operation and Development (OECD) and the World Bank in 1967. It has been keeping record of all the aid activities in this database in order to provide a constant flow of aid data so that it is widely used by governments, organizations and researchers active in the field of development. All fund allocated as aid is classified into 42 3-digit purpose codes then which further divided into 197 5-digit purpose codes based on “which specific area of the recipient’s economic or social structure is the transfer intended to foster.” Under this CRS purpose coding, aid for trade can be largely divided into three types: economic infrastructure, building productive capacity, and trade policy and regulations (See Appendix A. for detailed list).

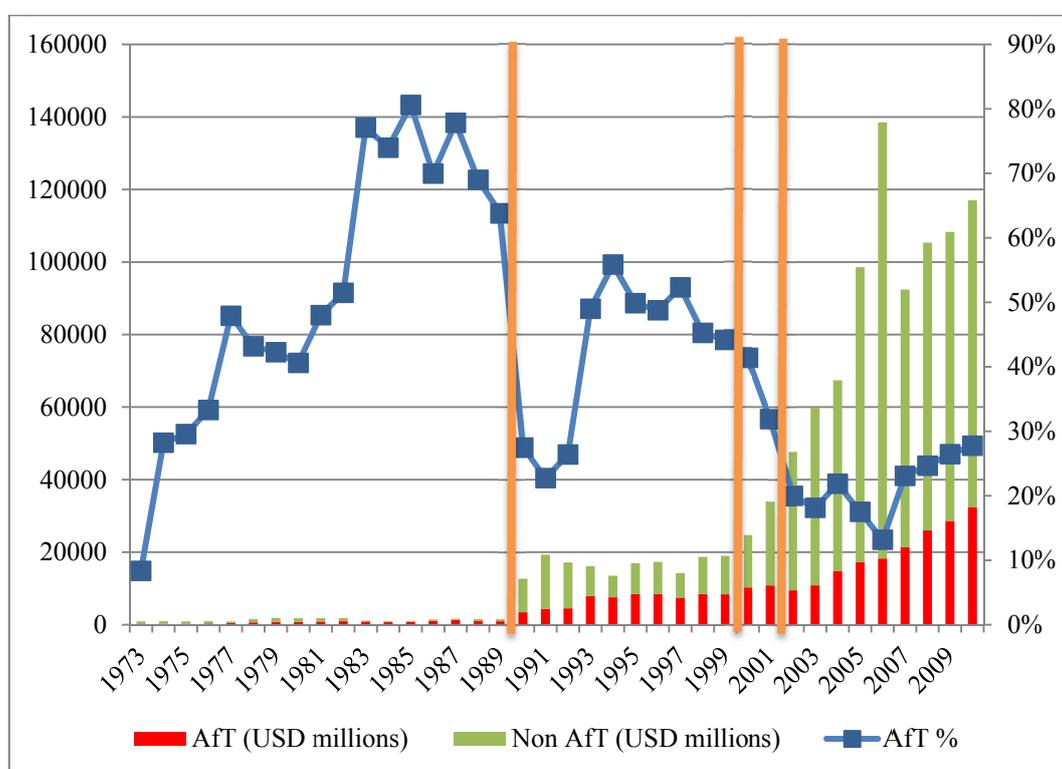
### **(3) Recent Trends**

Aid for trade accounts for about 30% of total aid disbursed to developing countries in 2010, constantly increasing its share since 2007. Although it peaked up to about 80% of total aid during the 1980s, the credibility of data available at CRS is low as the *CRS User’s Guide* confirms. According to the *CRS User’s Guide*, coverage ratios vary over time and it is not recommended to use disbursement flows before 2002, because the annual coverage is below 60%. Later, it has improved to around and over 90% since 2002 and reached nearly 100% starting with 2007 flows. As OECD CRS breaks down data from 1973 to 1989, 1990 to 1999, 2000 to 2001, and 2002 to last year, the

graph below shows breakdown of different original datasets. It is interesting that although total aid showed a huge drop in 2007, aid for trade did not fall. This may suggest that aid for trade is less elastic to external changes and more consistent than aid given to other sectors.

**Figure 1: Total Aid for Trade Flow as % of Total Aid (1973-2010)**

(Unit: USD millions, current)



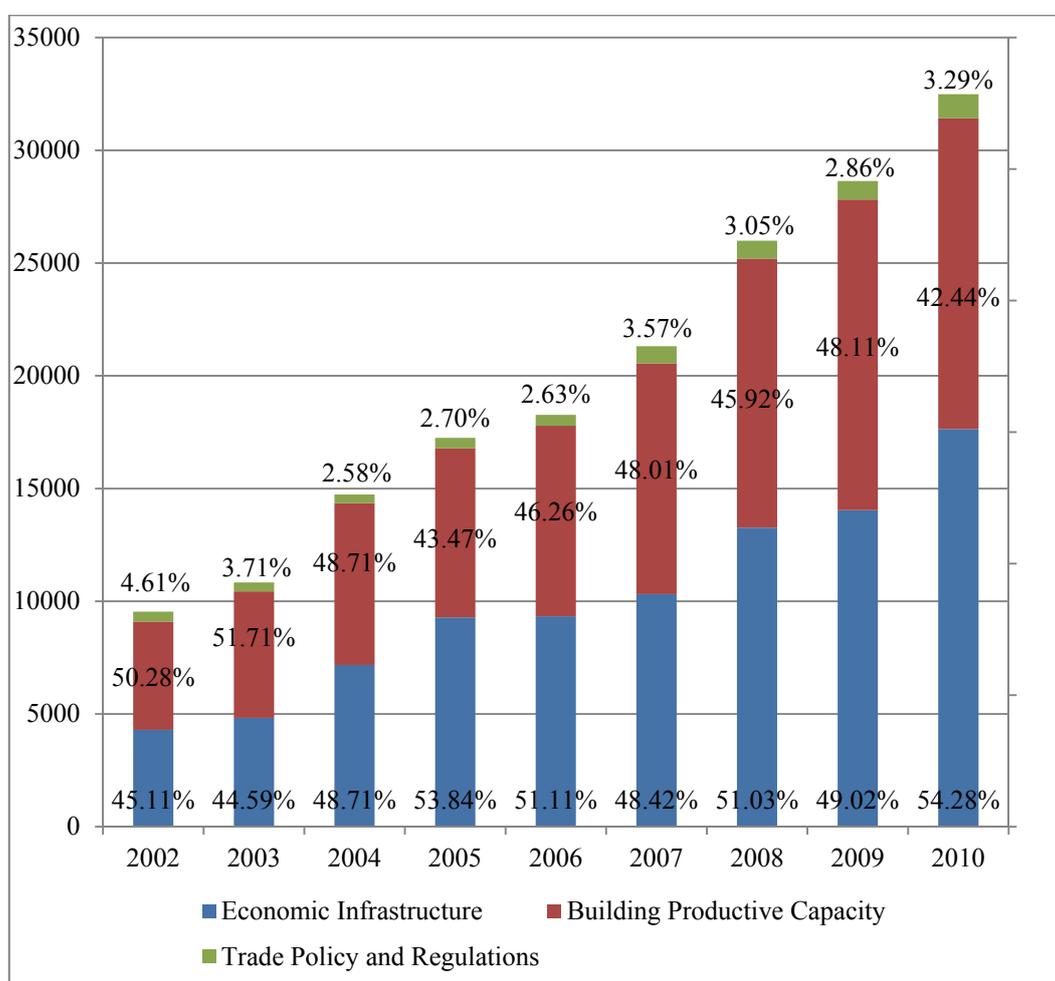
(Source: Author's own calculation using data from OECD CRS<sup>2</sup>)

<sup>2</sup> Source of all the figures related to aid in this paper is Author's own calculation using data from OECD CRS unless stated otherwise.

About more than 90% of aid for trade is directed to economic infrastructure and building productive capacity building. Only less than 5% is used for trade policy and regulations. This can be attributed to the nature of infrastructure and capacity building projects which require a larger sum of financial resources.

**Figure 2: Aid for Trade Disbursed by Sector (2002-2010)**

(Unit: USD millions, current)



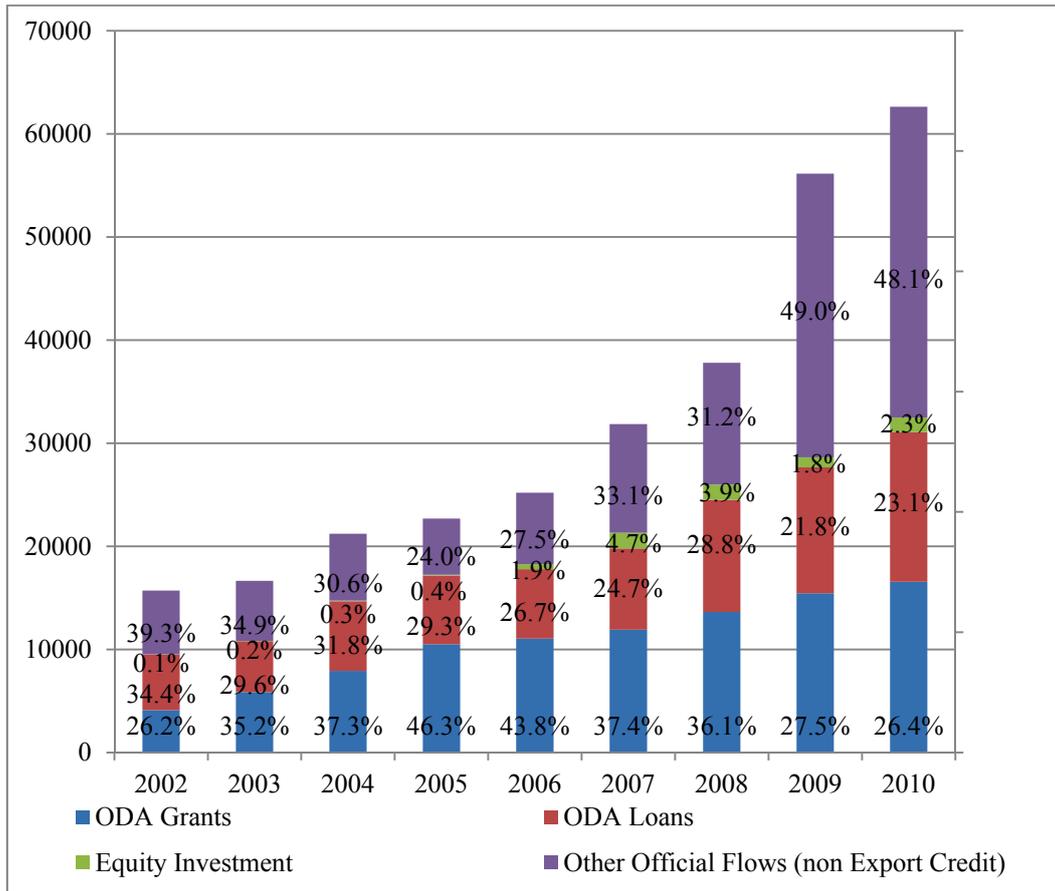
Aid for Trade can be classified not only by its purpose but also by type of flow. In order to qualify for official development assistance (ODA), it must be either in form of grant or loan. If ODA does not have any pay-back duty and does not incur any debt, it is qualified as grant. To be classified as ODA loan, it must have a grant element above 25 per cent. In addition, an ODA loan has to have interest rate below the prevailing market rate. Equity investment comprises direct financing of enterprises in a developing country which does not (as opposed to direct investment) imply a lasting interest in the enterprise.

Other official flows (OOF) are official sector transactions which do not meet the ODA criteria. Although OOF does not qualify for aid for trade in the narrow sense because they have a grant element of less than 25% (i.e. low concessional loans), “these flows can play a crucial role in financing trade related activities.” OOF for trade significantly increased in the last few years as donors were experiencing financial pressure due to the economic crisis (OECD/WTO, 2011a, 49). Assuming that OOF in the trade-related sectors have a similar impact as aid for trade except that it has a pay-back duty with higher interest rates, this paper considers OOF as a part of aid for trade for all calculations below unless stated otherwise.

As shown in Figure 3, grants and loans are about the same in size while OOF increased to be double of both grants and loans. Equity investment flow increased its share over the last decade but remains to be miniscule accounting only 2.3% in 2010. If OOF is included, total aid for trade amounts to USD 60 billion in 2010. Percentage of loan is at decline; AfT is more concentrated around grant and OOF.

**Figure 3: Aid for Trade Disbursed by Type (2002-2010)**

(Unit: USD millions, current)

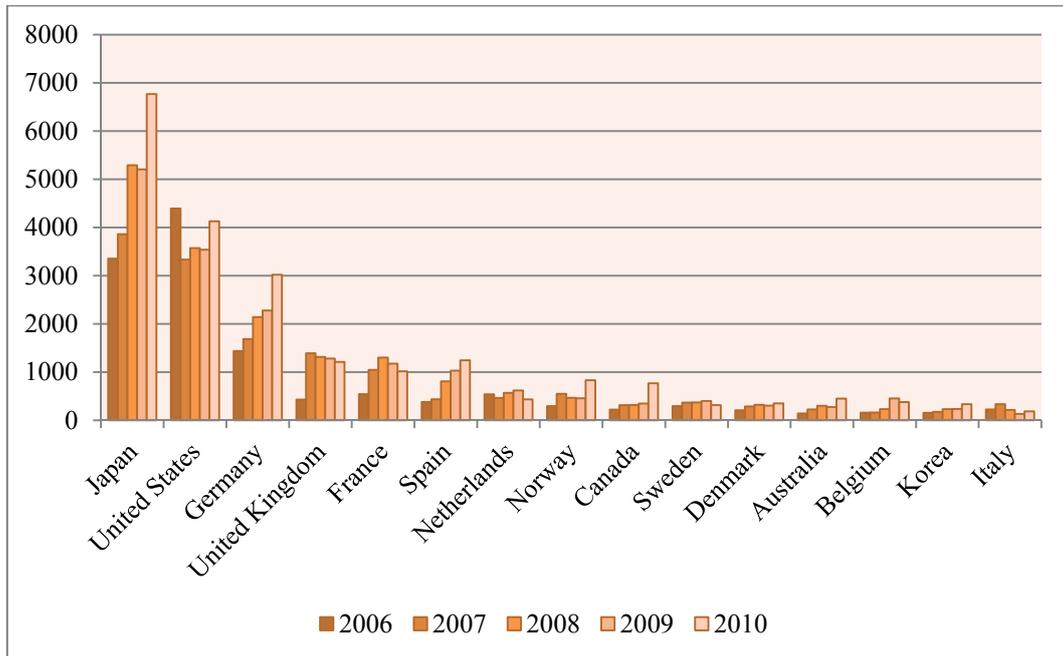


Prior to building estimation model, it is necessary to understand characteristics of donors and recipients of aid for trade. Figure 4 shows top 15 donor countries in the last 5 years excluding OOF. In terms of donor countries, Japan has surpassed the United States as the largest donor of aid for trade over the last five years. Germany, Spain, Norway, Canada, Australia and Korea are rapidly increasing their AfT contribution.

Some donor countries such as France and Italy have reduced its disbursement for aid for trade, partly due to financial constraints.

**Figure 4: Top 15 Bilateral Donors (2006-2010)**

(Unit: USD millions, current)

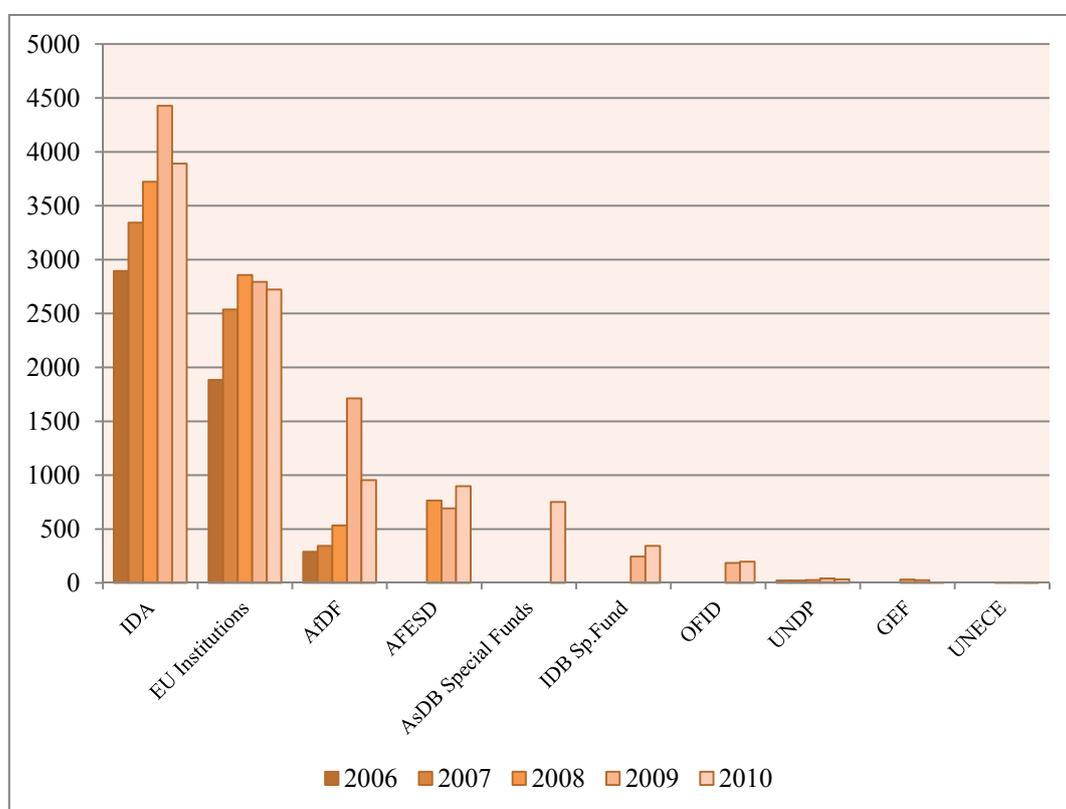


Multilateral entities such as World Bank and European Unions are also leading donors of aid for trade. From the top, top 10 multilateral donors are International Development Association, European Union Institutions, African Development Fund, Arab Fund for Economic & Social Development, Asian Development Special Funds, Inter-American Development Bank Special Funds, Organization of the Petroleum Exporting Countries Fund for International Development, United Nations Development Programme, Global Environment Facility, and United Nations Economic Commission for

Europe. Large international institutions such as International Monetary Fund and World Bank did not make the list as their assistant programs are considered as OOF as they have grant element less than 25%.

**Figure 5: Top 10 Multilateral Donors (2006-2010)**

(Unit: USD millions, current)

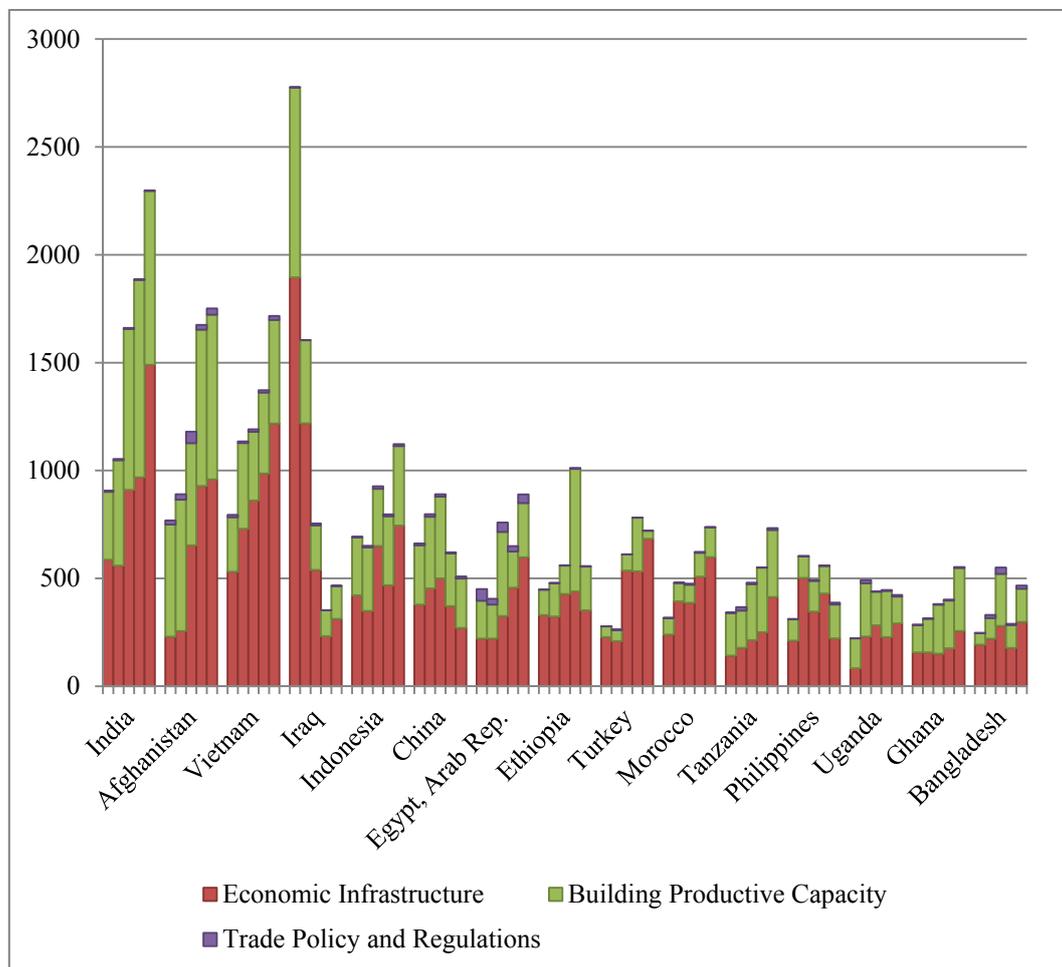


The top 15 recipients by sum of last 5 years' disbursements excluding OOF are as follows. India was the largest recipient of aid for trade, followed by others large trading nations such as Vietnam, Indonesia, China, Turkey and Egypt. Afghanistan and

Iraq made to the list due to large reconstruction projects in the aftermath of wars. Except for few cases such as China and Philippines, most countries experienced increasing aid for trade inflow in the last five years.

**Figure 6: Top 15 Recipients (2006-2010)**

(Unit: USD millions, current)

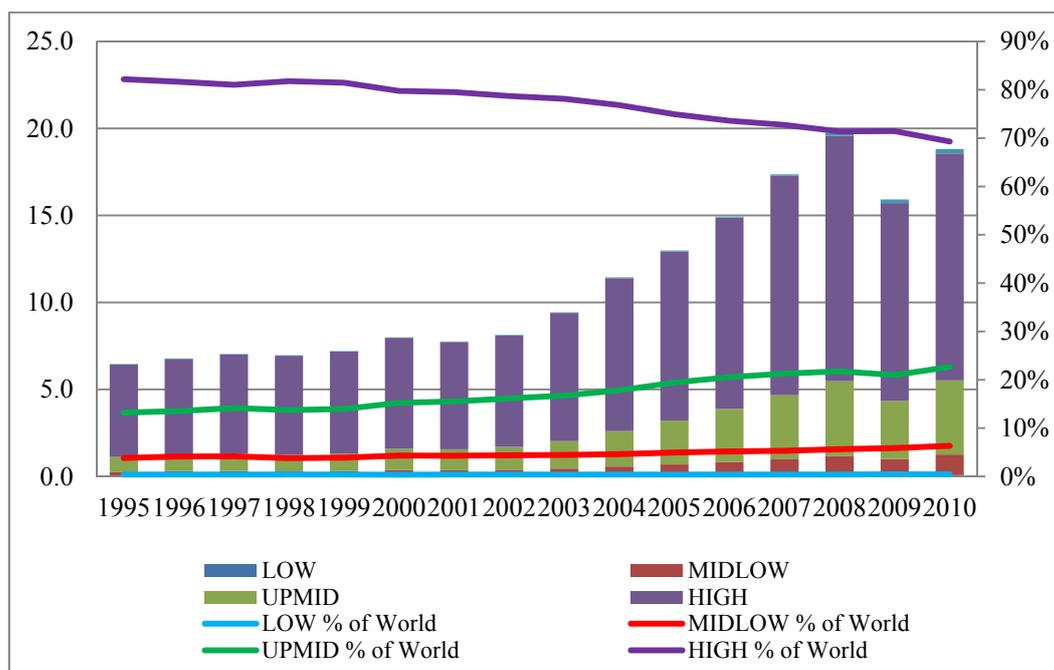


In order to see the characteristics of countries that are in the most desperate need for trade facilitation, analyzing the countries by income group may be useful as it is expected that poorer countries will suffer from lower trade. For this purpose, this paper will adopt the income group definition of the World Bank which is based on Gross National Income (GNI) per capita of 2010. The groups are: low income countries (LOW) with GNI of \$1,005 or less; lower middle income countries (MIDLOW) with GNI of \$1,006 - \$3,975; upper middle income countries (UPMID) with GNI of \$3,976 - \$12,275; and high income, \$12,276 or more (World Bank, “Group Definitions” <http://data.worldbank.org/about/country-classifications>, See Appendix A for List of Countries by Income Group).

As AfT aims to enhance trade, understanding of trade structure of the world is essential in order to check whether the aid for trade has responded to the needs of developing countries properly. When the world export is divided by income groupings, high income countries, although decreasing, takes up 70~80% of world export while low income countries have only 0.4%. Fortunately, lower middle income countries increase its share from 3.8% to 6.3% while upper middle income countries increase from 13.2% to 22.7%. This is mainly due to trade expansion of large countries such as China, Russia, Brazil and Mexico which successfully increased their share in the world market. On the other hand, low income countries could not increase its share as other developing countries did but remained its share at 0.4% for the last 15 years.

**Figure 7: Share of World Export by Income Group (1995-2010)**

(Unit: USD trillion, current)



(Source: Author's own calculation using data from UN COMTRADE<sup>3</sup>)

Then, did the low income countries which benefited the least from share shift of last 15 years receive the most aid for trade? Amount of aid for trade allocated to the low income countries increased in absolute term and also as a share of its export. By 2010, low income countries received aid for trade equivalent to 11% of their export value (about 12% if OOF is included). In average, each low income country received USD 231 million (248 million if OOF is included). Lower middle income countries received

<sup>3</sup> Source of all the figures related to trade in this paper is Author's own calculation using data from UN COMTRADES unless stated otherwise.

similar amount of USD 250 million as low income countries in average. However, their OOF is almost double the amount of their ODA, adding up to USD 449 million in 2010. Upper middle income countries received less than half of what low and lower middle income countries got in terms of ODA but if OOF is included, they received the most. It is likely that donor countries prefer to give OOF in trade sectors instead of ODA as upper middle income countries have already integrated into the world economy successfully. Donors may perceive that it is most effective to use loans in already well-functioning export sectors while low income countries still need ODA in grant basis.

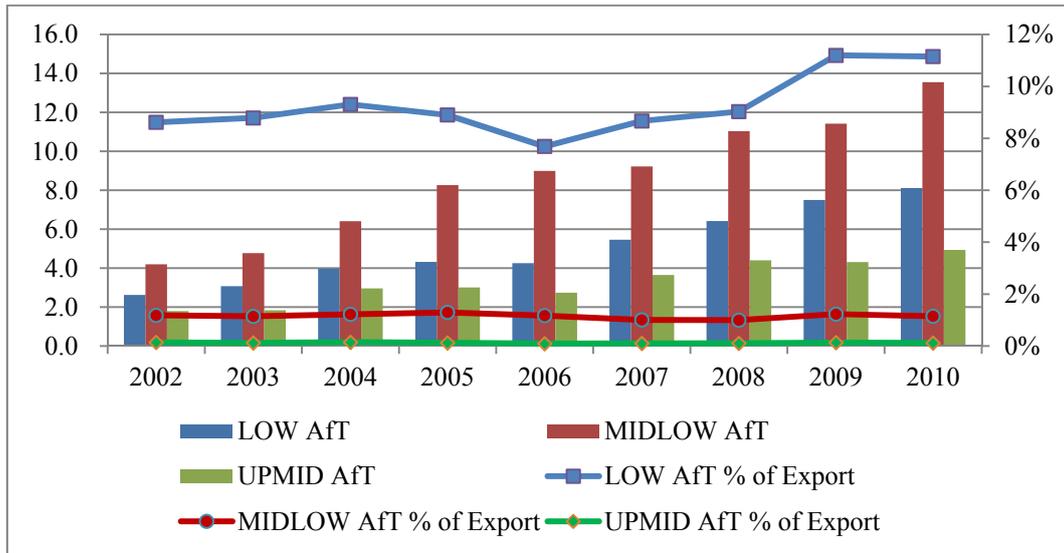
**Table 1: Average Aid for Trade Received by Income Group (2002-2010)**

(Unit: USD million)

| Year | LOW (35) |          | LOWMID (54) |          | UPMID (47) |          |
|------|----------|----------|-------------|----------|------------|----------|
|      | ODA      | ODA+OOF  | ODA         | ODA+OOF  | ODA        | ODA+OOF  |
| 2002 | 74.81273 | 74.84879 | 77.72471    | 100.2239 | 38.23066   | 141.9526 |
| 2003 | 87.73186 | 88.82987 | 88.27542    | 115.845  | 39.01721   | 128.112  |
| 2004 | 113.6117 | 115.0458 | 118.776     | 149.9159 | 62.96361   | 160.5873 |
| 2005 | 123.3211 | 125.0871 | 153.0312    | 190.6641 | 63.97611   | 132.3222 |
| 2006 | 121.512  | 124.172  | 166.541     | 213.7551 | 58.20582   | 144.5009 |
| 2007 | 155.9757 | 158.8192 | 170.759     | 247.7473 | 77.62968   | 203.2422 |
| 2008 | 183.3237 | 198.6872 | 204.3266    | 282.7114 | 93.6265    | 218.6078 |
| 2009 | 214.2553 | 238.7993 | 211.4646    | 348.1099 | 91.74771   | 451.8293 |
| 2010 | 231.9088 | 248.8492 | 250.9728    | 449.7759 | 105.0167   | 462.2208 |

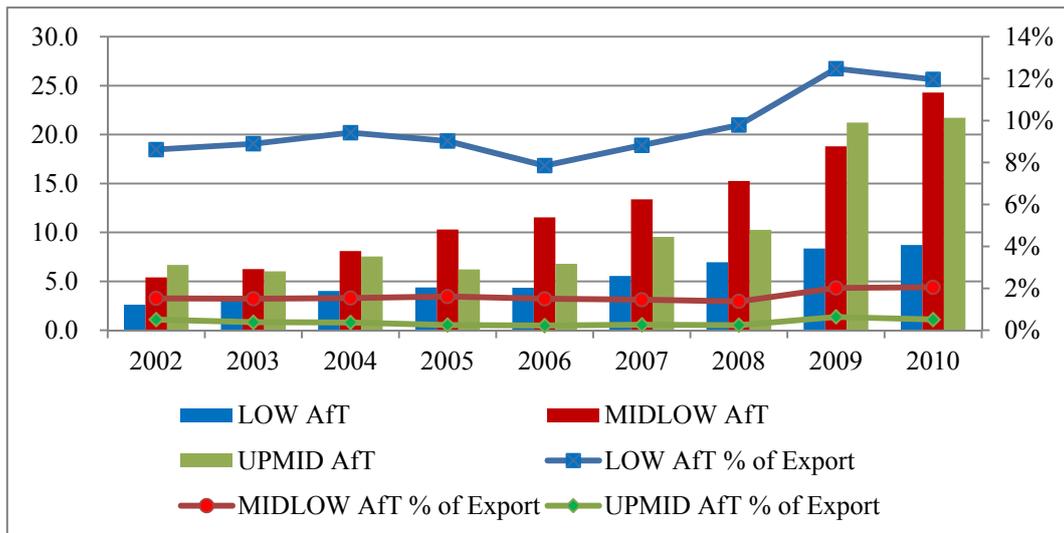
**Figure 8: Aid for Trade (excluding OOF) Received by Income Group (2002-2010)**

(Unit: USD billion)



**Figure 9: Aid for Trade (including OOF) Received by Income Group (2002-2010)**

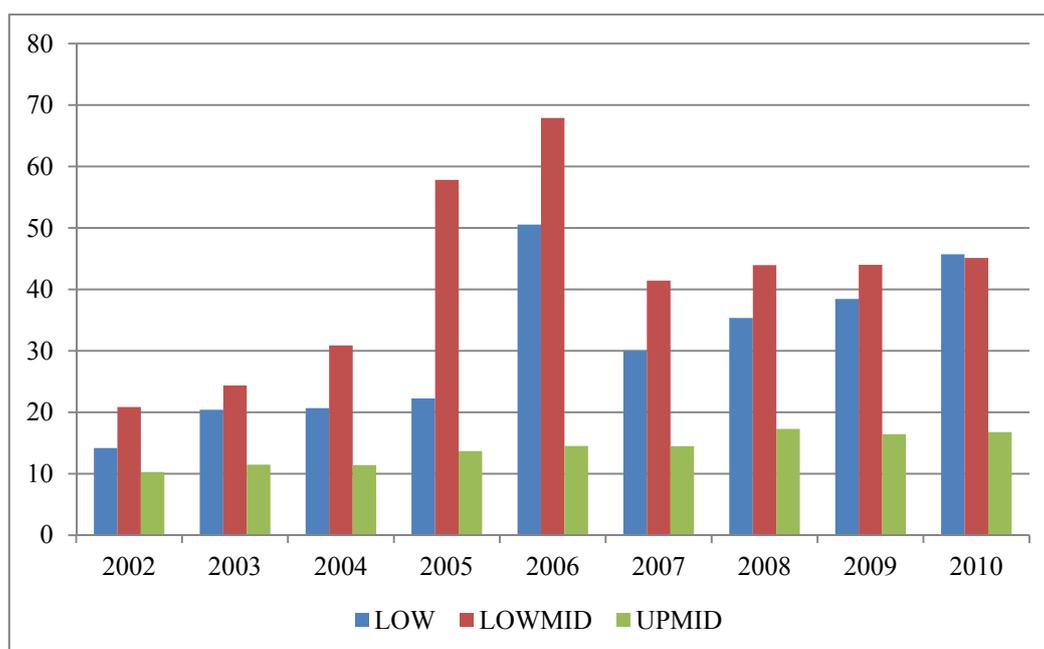
(Unit: USD billion)



If AfT allocation is compared to the total aid, AfT is more concentrated in lower middle income group. In 2010, low and lower middle income groups received similar amount of ODA, both totaling USD 45 billion. Yet, low income group received 8 billion while lower middle income group received 14 billion as AfT. During 2005-6, aid given to lower middle countries surged as Iraq which received a large sum of aid for national reconstruction is included in that group.

**Figure 10: Total Aid Received by Income Group**

(Unit: USD billion)

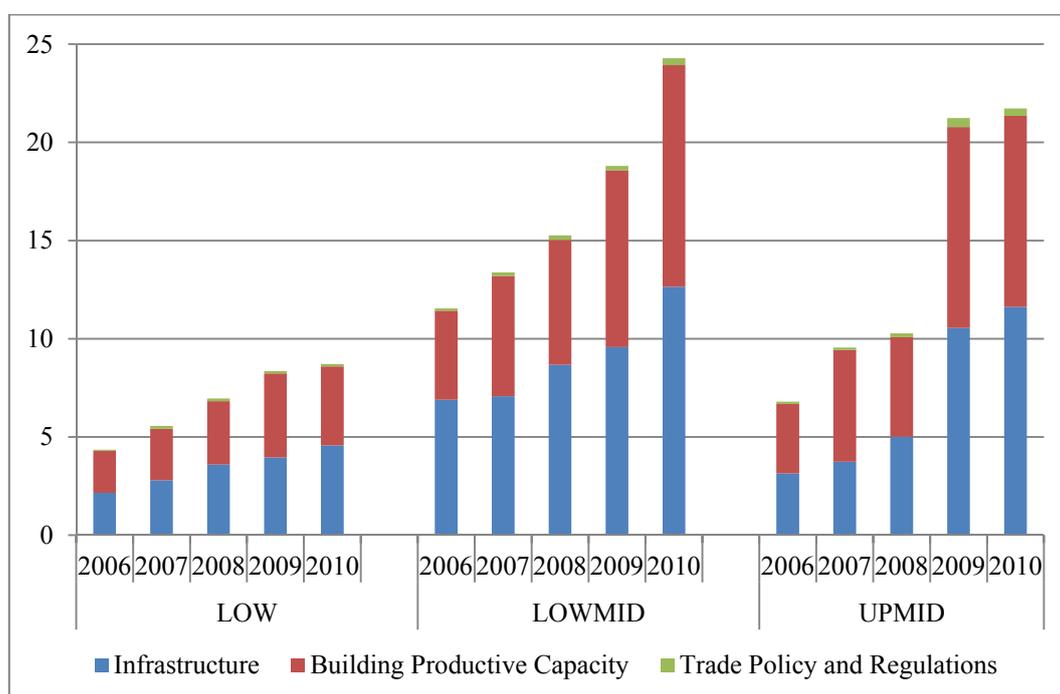


Although there is some difference in terms of distribution among income group, there is almost no difference across income group when the sectoral composition is concerned. All income groups received about half as productive capacity building and the

other half as infrastructure while resources given for trade policy and regulations were miniscule.

**Figure 11: Aid for Trade Received by Income Group and by Sector**

(Unit: USD billion)

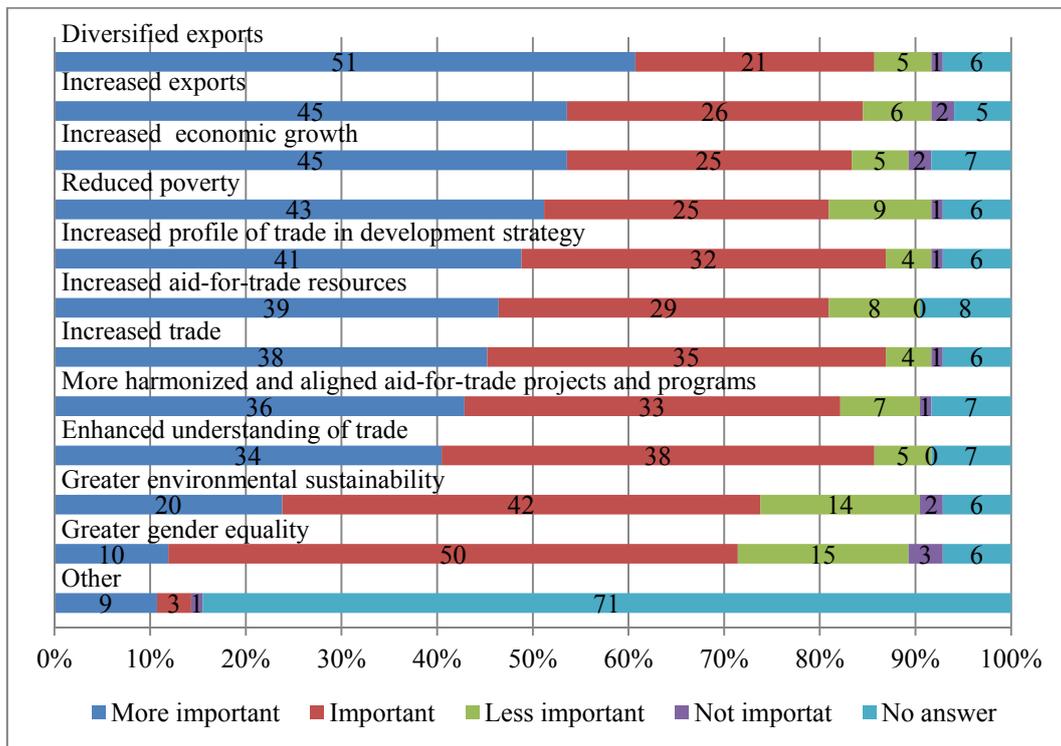


#### (4) Policy Objectives

In order to measure the success of aid for trade, it is necessary to look at the original objectives set by donors and recipient countries. According to the self-assessment questionnaires collected by the OECD in 2011, the main goals of each stakeholder varied across the range. While all stakeholders agreed that the aid for trade must realize both trade and development objectives, what recipients especially hoped for was export

diversification. About 60% (51 out of 84 countries that responded) emphasized diversified exports as the main goal even more than increased exports and increased economic growth. Desire for diversified exports is expressed by all income groups.

**Figure 12: Main Goals Recipients Want to Achieve through Aid for Trade**

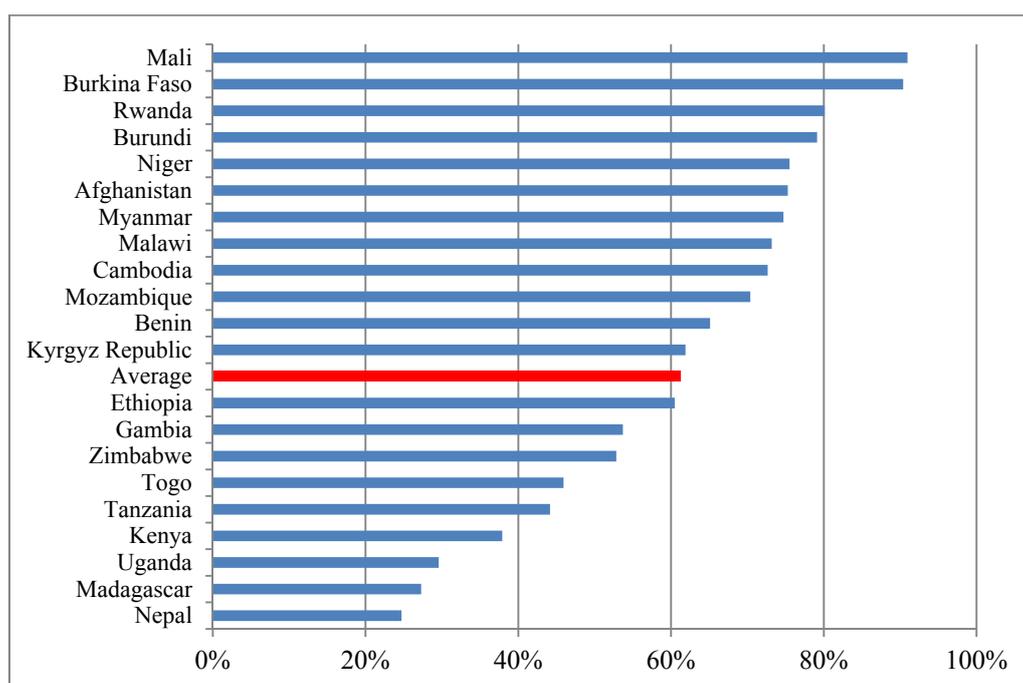


Note. From *Aid for Trade at a Glance 2011: Showing Results* by WTO/OECD, 2011, p. 94. Reproduced by author. \* The original question given to recipients was “How do you define the success of aid for trade in your country?”

The reason that developing countries value export diversification is that many of them are faced with severe export concentration. As the figure below illustrates, top three commodities of low income countries take up a major portion of their total export. Out of 35 low income countries, 21 countries for whom trade data is available are chosen. The average of those 21 countries in 2010 is 60%. In such situation, private investors will be

reluctant to pioneer into new sectors but will remain in certain industries where developing countries have comparative advantage and established active trade with the world. Despite the government putting high priority on export diversification, many developing countries continue to rely on the few export commodities (WTO/OECD, 2011b, 22). In this respect, AfT can create a vanguard effect and lead recipient government and private sectors to invest in other various sectors.

**Figure 13: Share of Selected Low Income Countries' Top Three Commodities in Their Total Exports (2010)**



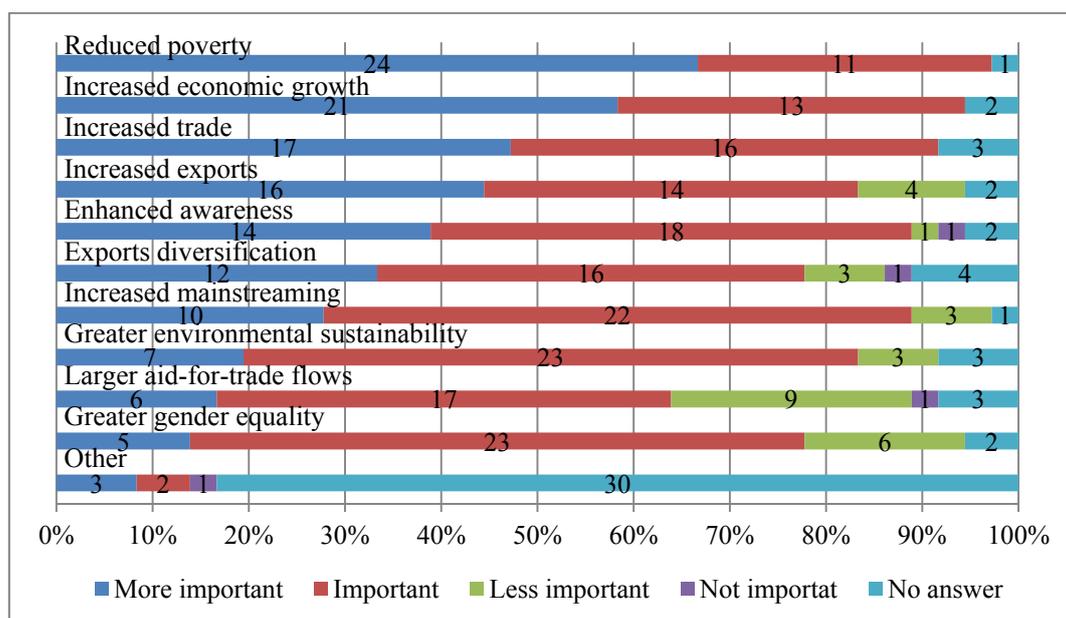
Note: based on SITC revision 3, 3-digit

Another explanation for the increasing focus on diversification is ongoing financial crises suffered by the international community. Countries have to reduce

vulnerabilities by enhancing competitiveness through diversifying their exports. Although this global crisis is not cited as explicit causal factor, it must have exerted indirect pressures to developing countries relying only on limited range of products (WTO/OECD, 2011a, 36).

On the other hand, export diversification is only the sixth highest priority for donors. One explanation may be that increasing exports is easier to achieve than diversifying the export basket so that donors hesitate to choose diversification as their target.

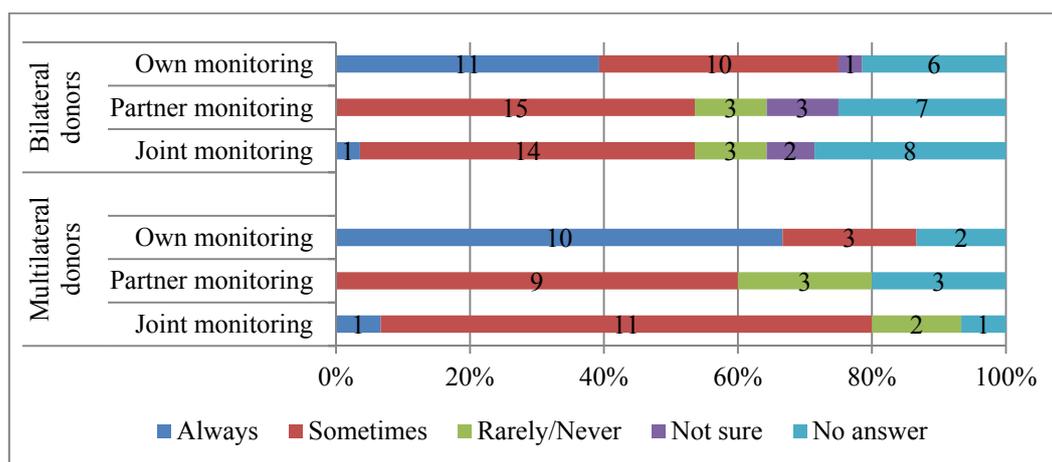
**Figure 14: Main Goals Donors Want to Achieve through Aid for Trade**



Note. From *Aid for Trade at a Glance 2011: Showing Results* by WTO/OECD, 2011, p. 96. Reproduced by author. The original question given to donors was “What are the objectives of your aid-for-trade strategy?”

As donor countries and recipient countries appear to seek different outcomes, measuring effectiveness of aid for trade should encompass assessment in perspective of both sides. Yet, donor agencies always conduct evaluations at different stages of aid projects and program based on their standpoint while recipient countries play a limited role in monitoring and assessment process. None of donors stated that partner (recipient) countries participate in monitoring process constantly. It is highly likely that recipient's priority is not sufficiently represented in the assessment.

**Figure 15: Who Monitors Aid for Trade Programs and Projects**



Note. From *Aid for Trade at a Glance 2011: Showing Results* by WTO/OECD, 2011, p. 177. Reproduced by author.

## (5) Evolution and Evaluation of Aid for Trade

Since Aid for Trade initiative was launched, there had been three global reviews held by WTO every two years. The first meeting held in 2007 focused on better

monitoring and evaluating process of AfT. The second review of 2009 was based on four key objectives: moving from commitment to implementation; mainstreaming trade in national and regional development strategies; sustaining aid flows during the global economic downturn; and Assessing the effectiveness of Aid for Trade (WTO, 2009). The Third Global Review of Aid for Trade, held on 18 and 19 July 2011, reviewed implementation of the Aid-for-Trade Initiative, notably as related to implementation of the 2010-2011 Aid-for-Trade Work Programme and showed that Aid for Trade is achieving results (WTO, 2011, para. 1) All three reviews underlined the continued high level political participation as well as the importance of proper and constant evaluation and monitoring of aid for trade.

Based on WTO and OECD's third bi-annual report *Aid for Trade at a Glance 2011: Showing Results*, it can be concluded that it is an appropriate timing to conduct statistical assessment of aid for trade in recipients' perspective for mainly three reasons. First, the flow of aid for trade has been accumulated enough in terms of length and amount to accomplish results in recipient countries. As shown in the previous sections, global flow of aid for trade is at constant increase for about a decade despite global financial crisis, amounting to 60 billion including ODA and OOF. Second, there has been a great shift in recipients' priority. Out of 84 recipient countries, 39 countries answered that there has been a change in priority in aid for trade since 2008 (OECD/WTO, 2011, 30). Among those countries whose priorities changed, many pointed competitiveness, economic infrastructure and export diversification as their first priority (31). Finally, OECD/WTO reports finds that many evaluation efforts are "characterized by a relative

absence of quantitative benchmark indicators of performance in either the number of outputs or in outcomes measured against baselines” (175). Therefore, it calls for more quantitative and less impressionistic results framework that is based on certain indices and data. Hence, this paper attempts to check the effectiveness of aid for trade in recipient’s point of view i.e. aid for trade as a tool for export diversification using trade and AfT dataset..

### **3. Literature Review**

Export, economic growth, and aid have been the key topics examined in academic literature concerned with development economics. Interactions between these topics have been covered in great detail. While there is a general consensus that some of these topics are related, there is still ongoing debate about the relationship between some of these topics. In this chapter, some major findings of previous literature will be presented in order to draw an analytical framework for the study conducted in this paper. Various studies that explored links between export and economic growth as well as aid and export are presented in the following subsections. Moreover, in search of a proper model to examine the effect of aid for trade on export diversification, some literature on export diversification with respect to economic growth and aid for trade are discussed.

#### **(1) Export and Economic Growth**

The relationship between export and economic growth has attracted the interest of many scholars. Hallaert (2006) summarizes many significant findings linking exports and economic growth. According to his summary, there is sizable evidence that outward-oriented countries experience faster growth even though some scholars disagree with his findings (Rodriguez and Rodrik, 1999). In sum, these regressions consisting of different samples and different time-frame strongly support the legitimacy of the objective of aid for trade to increase export for economic growth of developing countries. Yet, these studies do not distinguish the types of export increase and it is thus important to note that the result may be different for different types.

**Table 2: Results of Selected Studies Linking Exports and Economic Growth**

| Number of countries | Period    | Impact on Economic Growth*   | Source                        |
|---------------------|-----------|--|-------------------------------|
| 50                  | 1953-63   | Positive   | Emery (1967)                  |
| 41                  | 1950-73   | Positive   | Michaely (1977)               |
| 41                  | 1950-73   | Positive   | Heller and Porter (1978)      |
| 10                  | 1956-73   | Positive   | Balassa (1978)                |
| 11                  | 1960-73   | Positive   | Balassa (1982)                |
| 31                  | 1964-73   | Positive   | Feder (1983)                  |
| 4                   | 1955-78   | Positive   | Nishimizu and Robinson (1984) |
| 73                  | 1960-78   | Positive   | Kavoussi (1984)               |
| 41                  | 1960-81   | Ambiguous: positive for 1960-70; positive but often insignificant in the more recent period              | Kohli and Singh (1989)        |
| 17                  | 1950-80   | Positive   | Nishimizu and Page (1990)     |
| 4                   | 1976-88   | Positive   | Tybout (1992)                 |
| 104                 | 1960-88   | Positive   | Greenaway and Sapsford (1994) |
| 74                  | Post 1985 | Positive   | Greenaway et al. (1997)       |
| 69                  | 1975-93   | Positive   | Greenaway et al. (1999)       |
| 79                  | 1970-98   | Positive   | Wang et al. (2004)            |
| >100                | 1970-97   | Positive   | Yanikkaya (2003)              |
| 51                  | 1960-87   | Positive; not robust in all specifications   | Harrison (1996)               |
| 150                 | 1985      | Positive   | Frankel and Romer (1999)      |
| 23 to 62            | 1913-90   | Positive   | Irwin and Tervis (2002)       |
| About 100           | 1980-99   | Positive   | Dollar and Kraay (2001)       |
| About 100           | 1961-2000 | Positive   | Lee, Ricci, Rigobon (2004)    |
| > 100               | 2000      | Positive once controlled for the effect of domestic regulation; negative for heavily regulated economies | Bolaky and Freund (2004)      |
| 82                  | 1960-2000 | Positive if certain complementary reforms are undertaken   | Chang et al. (2005)           |

\* Note. Depending on the studies, growth in exports or growth in the share of exports in GDP were considered. From Hallaert (2006) A history of empirical literature on the relationship between trade and growth. *Mondes en développement*, 135(3), 63-77, p. 65. Reproduced by author.

## **(2) Aid and Export Growth**

Although export growth stimulates economic development, it is difficult to boost export using aid. Several studies attempted to find the relations between aid and export growth and most of them conclude that the relation is ambiguous. Suwa-Eisenmann and Verdier (2007, 503) state that “no literature so far provides straightforward and robust results regarding a complementarity between aid and trade flows.” Lloyd et al. (2001) find that causality exists in both ways between aid and trade and the result is different depending on which way the causality goes.

## **(3) Effectiveness of Aid for Trade**

Then if aid is limited to aid for trade, can it enhance export and possibly results in economic growth? There are several studies that have measured effectiveness of aid for trade using export volume as an indicator. According to Johansson and Pettersson (2008), aid for trade has a positive partial correlation between bilateral aid and bilateral trade in all sectors. Helble, Mann and Wilson (2009) find that assistance directed toward trade facilitation reinforces the trade volumes of recipient countries. With a high rate of return, every dollar of aid for trade can yield about US\$697 in additional trade. Therefore, cost-benefit analysis also proves that aid for trade is effective.

Some have found that aid for trade is effective in increasing export through various causes. Cali and Te Velde (2009) find that aid for trade reduces the cost of export thus facilitating export. As to the sectoral analysis, both aid to economic infrastructure and aid to productive capacity have a positive and significant impact on exports in their

sample of 120 developing countries. Similarly, Busse (2010) calculates that aid measures have a negative effect on the costs of trading using a panel regression with a sample of 99 developing countries for the period 2004-2009. On the other hand, Vijil and Wagner (2010) show that institutions and infrastructures are significant determinants of export performance so that aid for trade which can improve the two factors can also strengthen export. These arguments suggest that aid for trade does not only help bilateral trade between donors and recipients but also recipient's overall export as it changes economic environment.

#### **(4) Export Diversification and Economic Growth**

Unlike other studies mentioned above, this paper attempts to measure the effectiveness of aid for trade in terms of export diversification because this is the expressed desire of many recipients. Then, what is the logic behind many developing countries prioritizing diversification?

Empirical literature suggests that export diversification is an inherent feature of economic development and is directly related to economic growth for two main reasons (Hallaert and Hayashikawa, 2011, Agosin, 2006, Hesse, 2008). First, it reduces the vulnerability associated with a high concentration of exports shown in the previous chapter (2-3). This instability in export earnings coming from concentration does not only directly decrease national income but also makes domestic demand unstable and a more risky investment environment may reduce economic growth. Export diversification could reduce the influence of prices of few commodities on terms of trade and export earnings;

and therefore, it stabilizes export earnings in the longer run. (Collier and Dehn, 2001, and Guillaumont and Chauvet, 2001)

Second, diversification involves positive externalities. Exporters acquire knowledge through global competition and there are spillovers to other industries. Second, growth in different components of exports can have different effects on economic growth. Herzer and Nowak-Lehmann (2004) shows that the substantial impact of export diversification on Chile's economic growth is explained more by the knowledge spillovers than by the diversification into industrial exports.

In this regard, the World Bank acknowledges the importance of diversification and sets competitiveness and diversification in trade as one of four action areas in trade on which the World Bank Group aims to focus in the next decade (World Bank, 2011).

However, it is important to note that diversification and economic growth are not in linear relation. Cadot et al. (2007) discovered that production and employment concentration follow a U-shaped pattern and countries first diversify and specialize again at a certain point. Still, the turning point is very late in the development process and it is safe to assume that the development of both low and middle income countries is accompanied by a diversification of exported products.

### **(5) Aid for Trade and Export Diversification**

It is commonly accepted that relationship between aid and economic growth is difficult to detect as there are too many variables involved. Limited and inconsistent data

and heterogeneity of aid motives and types further contribute to complexity of the causality. Therefore, the effectiveness of aid still remains as a controversy (Bourguignon and Sundbert, 2007; Rajan and Subramanian, 2008; and Hansen and Tarp, 2000). Therefore, in order to measure the effectiveness of aid despite such challenges, one must narrow down the scope of aid and use more direct, less distant output as a dependent variable. As investigated above, export, especially diversified export fosters economic growth. If aid that has a specific use such as facilitating trade proves to increase trade based on diversification, it can increase its likelihood of being effective in fulfilling its objectives.

Although there are few in number, there are some previous attempts to study the effect of aid for trade on diversification. When aid is generally considered, it does not help diversify the export of recipient countries. Osakwe (2007) advocates that aid has a negative impact on the real exchange rate and results in further concentration among the sample of 31 African states (18). Nonetheless, when the scope is limited to aid for trade only, it seems that it is effective in diversifying exports.

Cadot et al. (2007) find that infrastructure for which more than 40% of aid for trade is allocated notably contributes to export diversification. Likewise, Munemo (2011) analyzes the effect of foreign aid on export diversification and finds an interesting correlation. As Osakwe notes, there is a danger of anti-export bias called Dutch disease associated with aid so that countries heavily depending on aid (more than 20% of GDP) experience negative relation between aid and diversification while countries with aid not

exceeding 20% of GDP enjoy positive relation. To summarize, if findings of previous literatures hold true, aid for trade should yield benefits to recipient's economy by diversifying export. Based on this fact, the next chapter establishes the regression model.

## 4. Model and Methodology

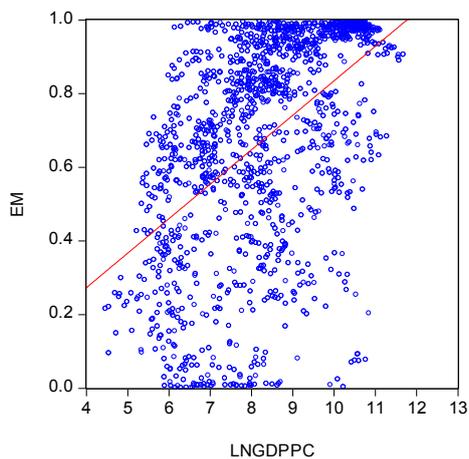
### (1) Extensive Margin (EM) and Intensive Margin (IM)

Among several indices measuring a variety of nation's export, this paper uses Hummels and Klenow (2005)'s extensive margin and intensive margin. They decomposed a country's exports into two margins that differentiate expansion of export into two types: increase of export by greater categories of products and increase of export by greater weight. They analyze the extent to which larger economies export higher volumes of each good (the intensive margin, IM), export a wider set of goods (the extensive margin, EM), and export higher-quality goods. Equation (1) illustrates the export share of a country  $j$  in the world market divided by EM and IM. EM and IM are calculated based on UN COMTRADE data using SITC revision 3, commodities in 5 digit.

$$(1) \quad s_j = \frac{\sum_{i \in I} V_{ji}}{\sum_{i \in I} V_{ki}} = \frac{\sum_{i \in I_j} V_{ki}}{\sum_{i \in I} V_{ki}} \times \frac{\sum_{i \in I_j} V_{ji}}{\sum_{i \in I_j} V_{ki}} = EM_j IM_j$$

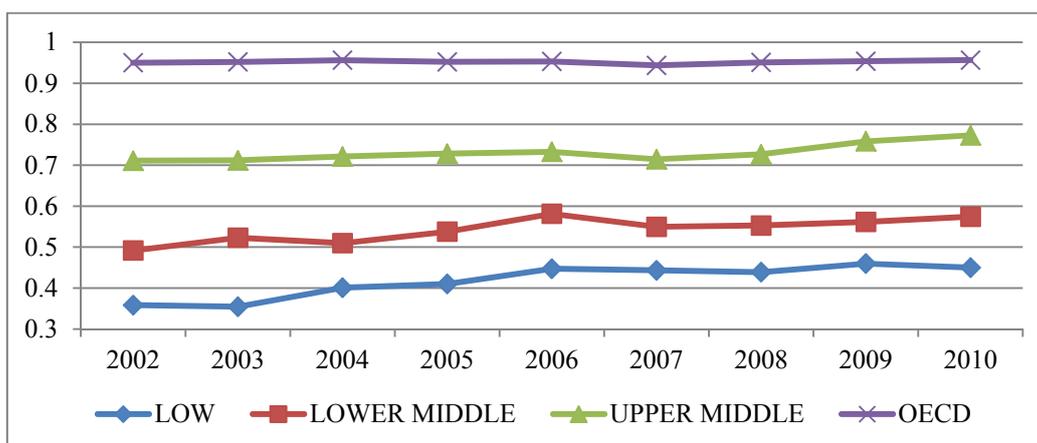
As already mentioned in the literature review, extensive margin is tend to increase as country's GDP per capita increases up to certain point. Thus, log of GDP per capita and EM has positive linear relations when drawn in a scattered plot. If exceptional rich oil-exporting countries such as Saudi Arabia, Kuwait, and UAE are excluded, the positive relation becomes even clearer.

**Figure 16: Scattered Plot of Log of GDP per Capita and Extensive Margin of All Countries (2002-2010)**

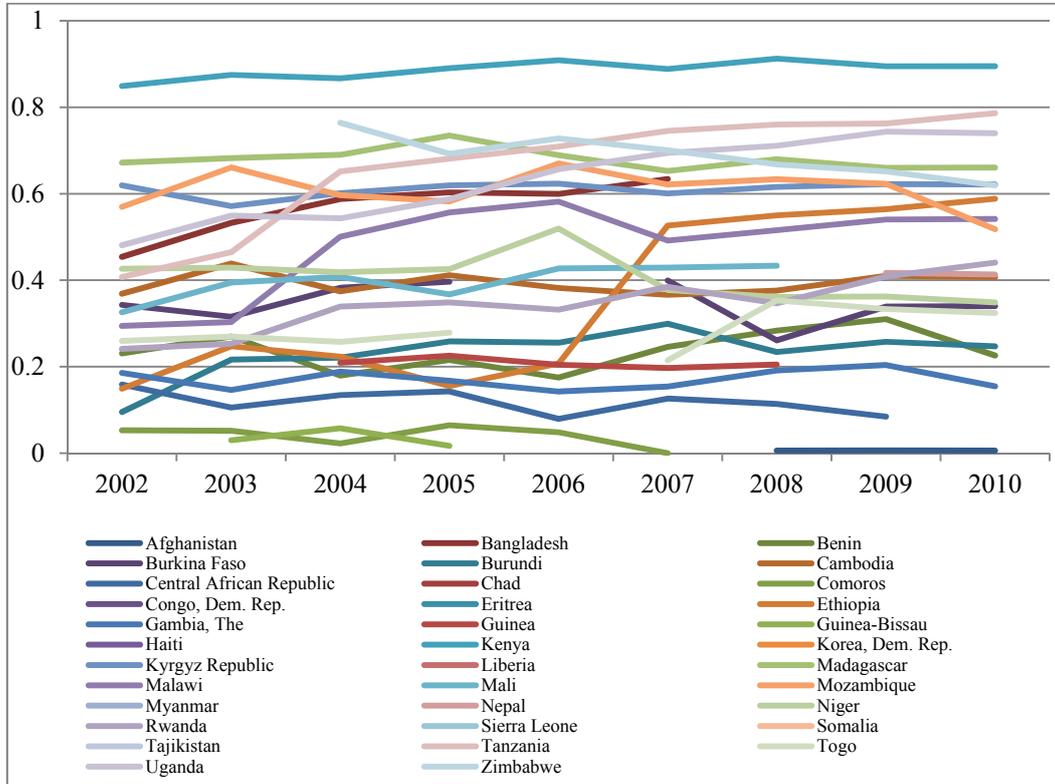


Extensive margin by income group below illustrates that OECD countries have very high and stable EM while EM of developing countries generally increased with some fluctuations. As it was verified in the previous scattered plot, the level of EM corresponds to the income level.

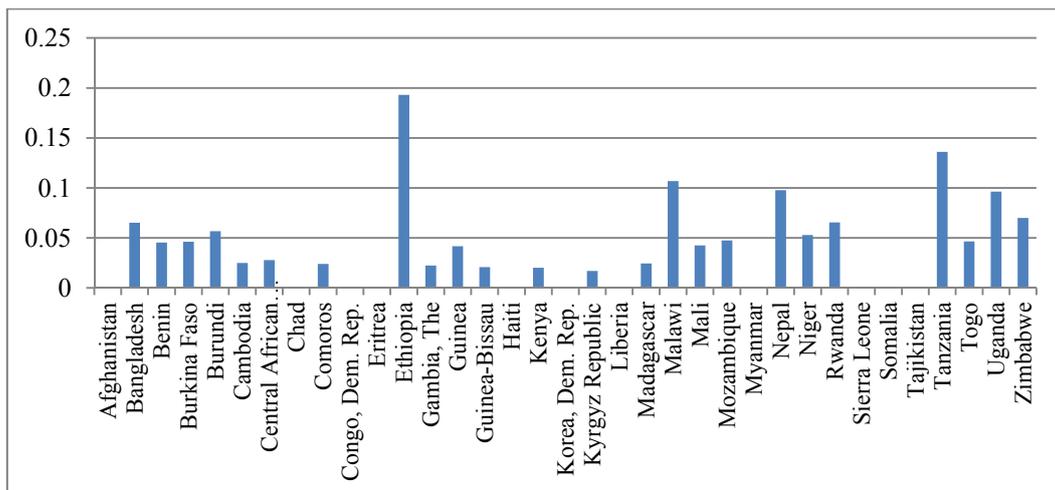
**Figure 17: Average of EM by Income Group (2002-2010)**



**Figure 18: EM of Low Income Countries (2002-2010)**



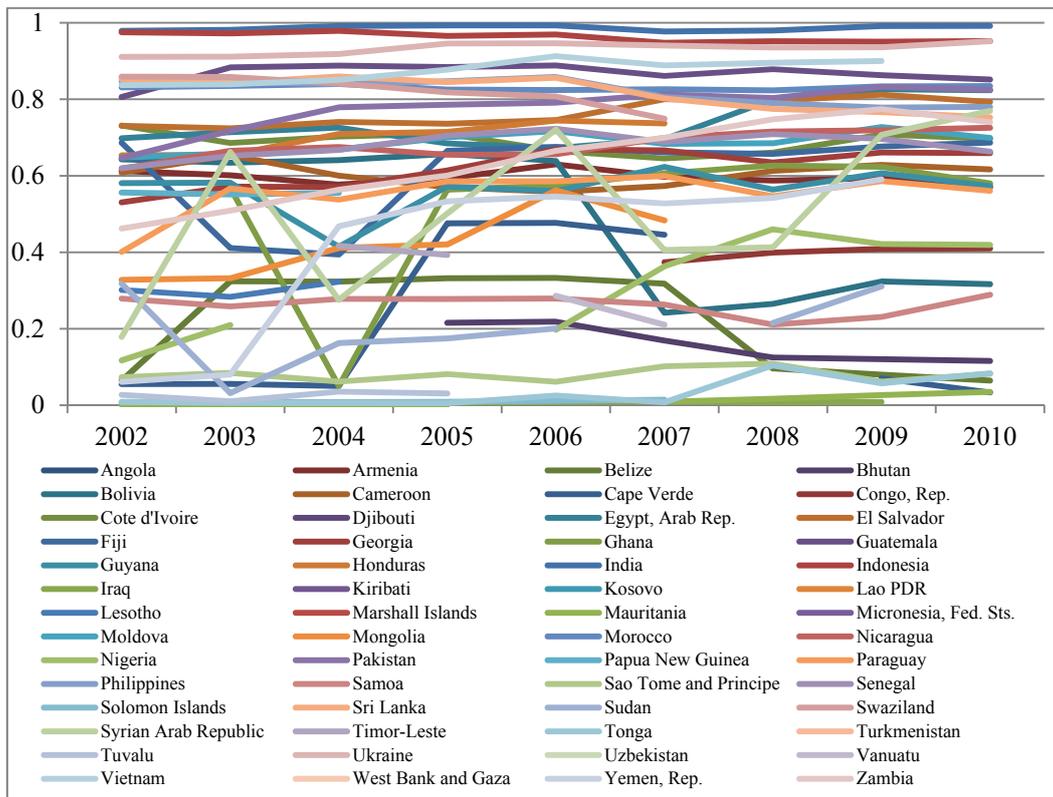
**Figure 19: Standard Deviation of EM of Low Income Countries (2002-2010)**



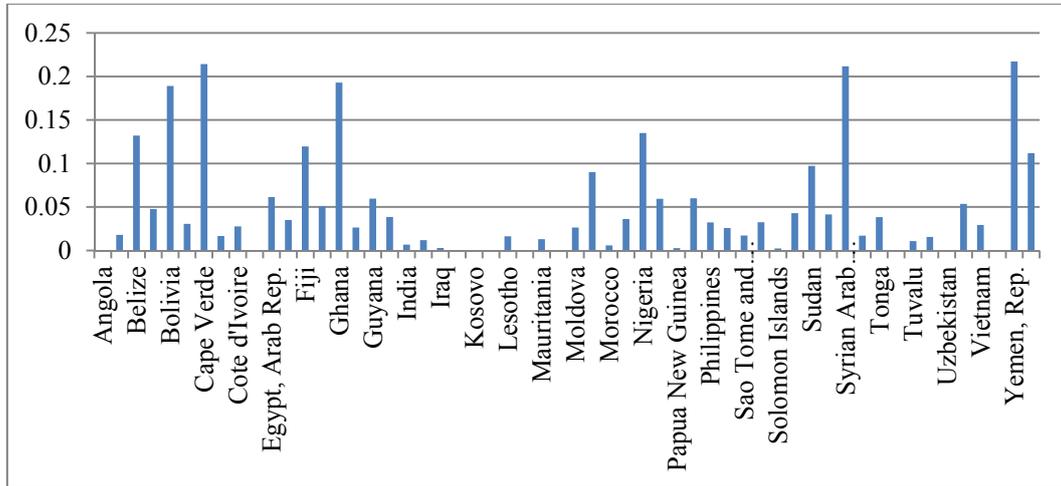
Extensive margin of low income countries is widely dispersed from 0 to 0.9. Also some of them fluctuate in a great deal, resulting in a relatively large standard deviation. This means that low income countries have a room for increased EM by developing new products but what is more important is being able to sustain its new line of exports.

Lower middle income countries share similar characteristics with the low income group. They also have largely scattered EM and high standard deviation. Yet, some of countries established a firm EM above 0.6.

**Figure 20: EM of Lower Middle Income Countries (2002-2010)**

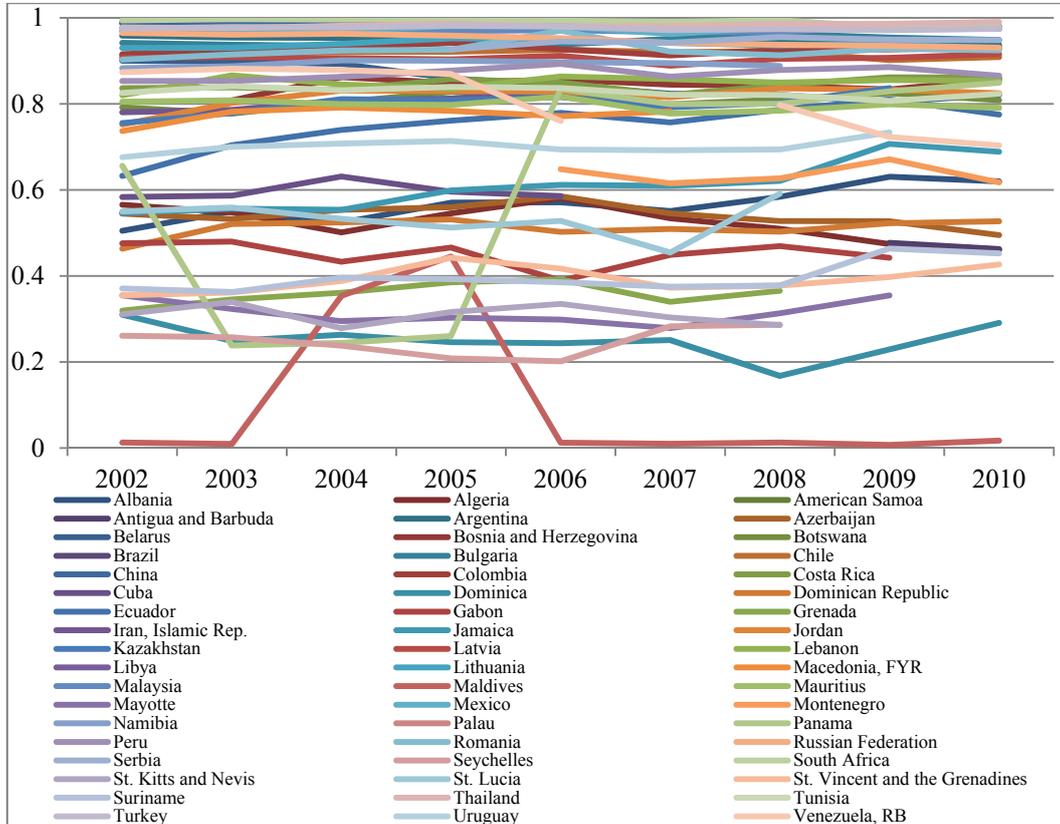


**Figure 21: Standard Deviation of EM of Lower Middle Income Countries (2002-2010)**

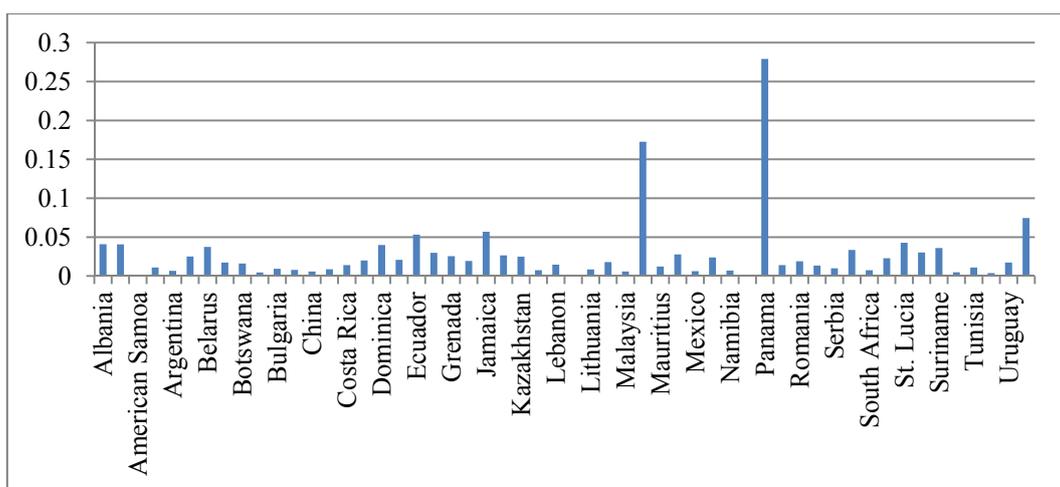


Upper middle income countries are more concentrated in upper band above 0.8 and most of them have low standard deviation meaning their EM rarely fluctuates. Finally, high income OECD countries are agglomerated in 0.9 and 1.0 range with lowest standard deviation, none of them exceeding 0.05. In other words, almost all high income countries and few capable developing countries are able to produce more than 90% of all exported commodities and compete at a global level with consistency. As they have managed to sell various kinds of commodities, they are relatively less influenced by sudden rise and fall of any commodity price. Also, once they succeeded to export a certain commodity, they continue to do so and secure to generate income continuously. Display of trend of EM change of individual countries grouped by income group also confirms the theory that EM and economic development is highly correlated.

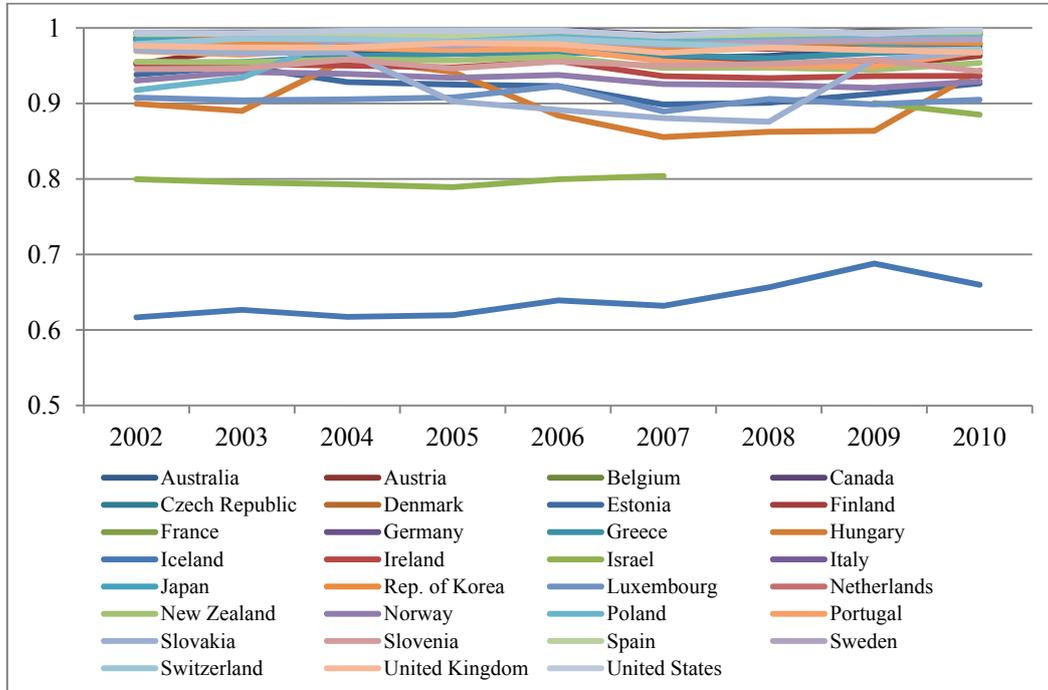
**Figure 22: EM of Upper Middle Income Countries (2002-2010)**



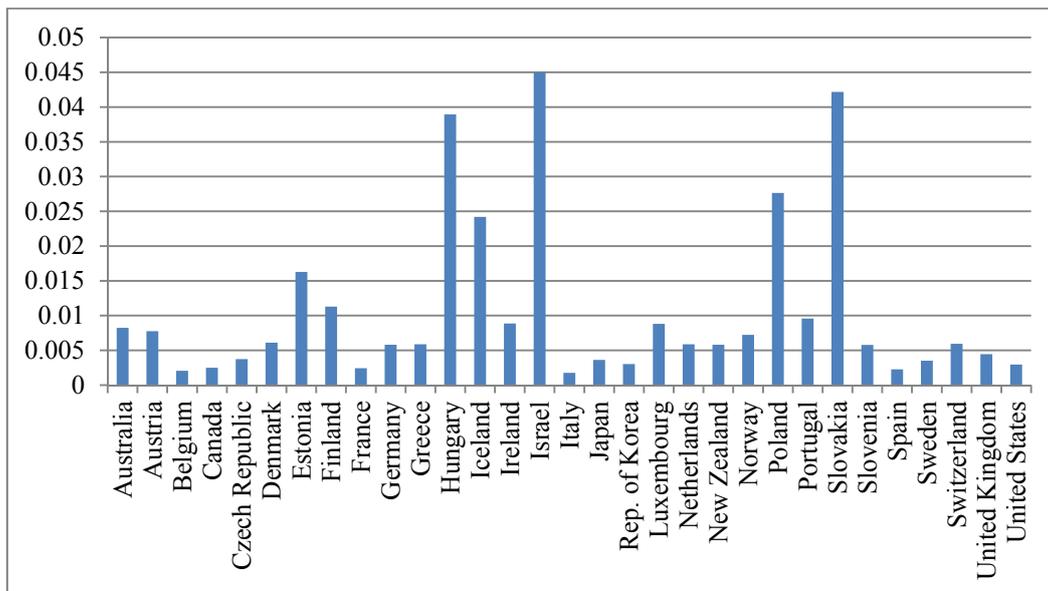
**Figure 23: Standard Deviation of EM Upper Middle Income Countries (2002-2010)**



**Figure 24: EM of High Income OECD Countries (2002-2010)**

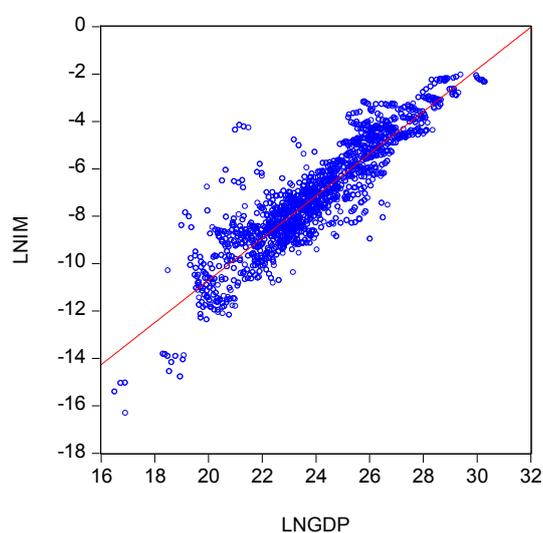


**Figure 25: Standard Deviation of EM of High Income OECD Countries (2002-2010)**



Intensive Margin, on the other hand is highly correlated to the size, rather than income level as it measures share of its export in the world market. Therefore, large developing countries like China have 0.12 while most of small developing countries have IM less than 0.00001.

**Figure 26: Scattered Plot of Log of GDP and Log of Intensive Margin of All Countries (2002-2010)**



Average of standard deviation of EM and IM of countries in each income group is presented below. As mentioned before, OECD countries EM remained stable for the last nine years, resulting in the lowest average. Nevertheless, as OECD countries have a high share in the world export market, the changes of their IM values are greater than that of smaller developing countries. Thus, the average of standard deviation of IM is the largest for OECD group.

**Table 3: Average of Standard Deviation of Countries' EM and IM by Income Group (2002-2010)**

| Income Group | EM      | IM      |
|--------------|---------|---------|
| LOW          | 0.05566 | 0.00016 |
| LOWER MIDDLE | 0.05925 | 0.00045 |
| UPPER MIDDLE | 0.02911 | 0.00083 |
| OECD         | 0.01063 | 0.00191 |

## **(2) Estimation Model**

Before setting up the estimation model, simple correlation and visual illustration of variables may be helpful in confirming the links between aid for trade and extensive/intensive margin.

**Table 4: Correlation between Aid for Trade Value and Average of EM/IM by Income Group (2002-2010)**

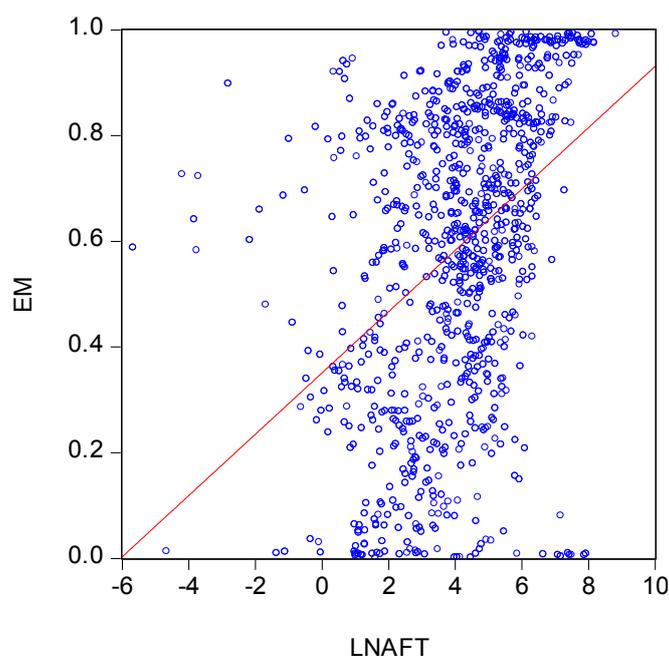
| Income Group | EM       | IM       |
|--------------|----------|----------|
| LOW          | 0.822077 | 0.906595 |
| LOWER MIDDLE | 0.788418 | 0.478897 |
| UPPER MIDDLE | 0.906778 | 0.910716 |

There is a strong correlation between the amount of aid for trade received by low income countries and average EM of low income countries. In other words, extensive margin increased as more aid for trade was allocated to the low income countries. This strong correlation also applies to the upper middle income countries, and to some degree to lower middle income countries. The correlation pattern between intensive margin and

aid for trade by income group is similar to the extensive margin. While average IM of low income countries and upper middle income countries is highly correlated to the amount of aid for trade that they received, the impact is ambiguous for lower middle income countries.

Graphically, it can be argued that there is also a positive relationship between aid for trade and extensive margin of recipient countries.

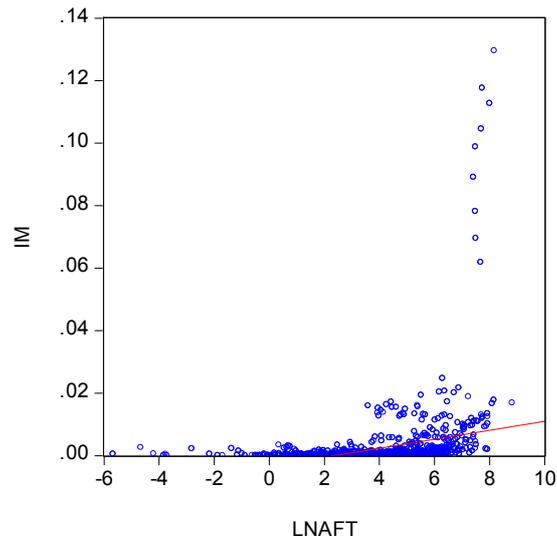
**Figure 27: Scattered Plot of Log of Aid for Trade and Extensive Margin (2002-2009)**



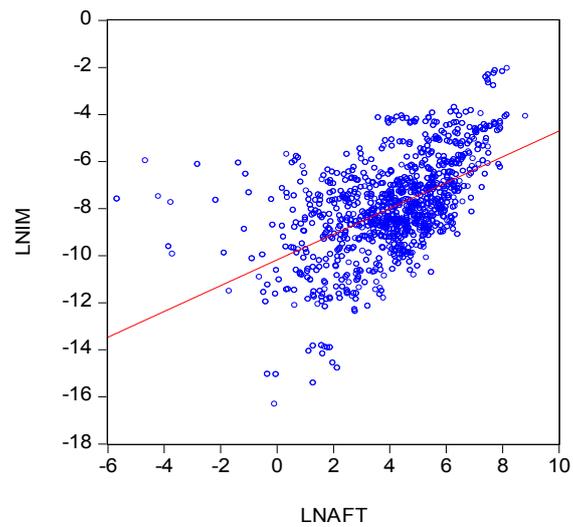
The linkage between intensive margin and aid for trade is less visible due to the nature of this index. Regardless of income level, export composition and amount of aid received, intensive margin is mostly affected by sheer size of the trade. In addition, China shown in upper right corner aligned in a vertical line is an obvious outlier, severely

skewing the distribution of the panel data. Therefore, this paper will use log of intensive margin instead for analysis.

**Figure 28: Scattered Plot of Log of Aid for Trade and Intensive Margin (2002-2009)**



**Figure 29: Scattered Plot of Log of Aid for Trade and Log of Intensive Margin (2002-2009)**



The estimation (2) investigates the impact of aid for trade on country  $i$ 's EM while (3) looks at the relationship between log of IM and aid for trade received by the country  $i$ . As EM of countries range from 0 to 1, the coefficient of each factor may be too small. To confirm the influence of each factor, EM is multiplied by 100.

$$(2) \quad 100 * EM_{i+1} = \beta_0 + \beta_1 GDP_{PCi} + \beta_2 EX / GDP_i + \beta_3 IM / GDP_i + \beta_4 FDI / GDP_i + \beta_5 CAP / GDP_i + \beta_6 ODA / GNI_i + \beta_7 Regqual_i + \beta_8 LnAFT_i + \mu_i + \varepsilon_i$$

$$(3) \quad LnIM_{i+1} = \beta_0 + \beta_1 GDP_{PCi} + \beta_2 EX / GDP_i + \beta_3 IM / GDP_i + \beta_4 FDI / GDP_i + \beta_5 CAP / GDP_i + \beta_6 ODA / GNI_i + \beta_7 Regqual_i + \beta_8 LnAFT_i + \mu_i + \varepsilon_i$$

There are several problems that must be addressed before checking the regression. First, there is a possibility of reverse causality. As is widely recognized by several authors (Lloyd *et al.*, 2001), the causality between aid flows and trade flows can obviously also go both way. While this paper is concerned with the causal link from aid for trade to export, trade can affect aid allocation in different ways. One possible way to check for reverse causality is to conduct the Granger test. In this paper, we implicitly incorporate this idea of causality by using 1 year lead of dependent variable to be explained by the values of the independent that were measured a year before.

Another aspect to consider is omitted variable bias. In order to incorporate any variables that might affect the dependent variables into the model, the panel data is run with the country-fixed effect. Here,  $\mu_i$  denotes cross-section fixed effects and  $\varepsilon_i$  represents the residuals. Other variables are as explained below.

**Table 5: Variables Used in the Model**

| Data from World Development Indicators, World Bank            |   |
|---|---|
| Variable  | Description   |
| GDP per capita (GDPPC)  | GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Data are in current U.S. dollars.  |
| Exports of goods and services as % of GDP (EX/GDP)            | Exports of goods and services represent the value of all goods and other market services provided to the rest of the world.   |
| Imports of goods and services as % of GDP (IM/GDP)            | Imports of goods and services represent the value of all goods and other market services received from the rest of the world.   |
| Foreign direct investment, net outflows as % of GDP (FDI/GDP) | Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net outflows of investment from the reporting economy to the rest of the world and is divided by GDP.   |
| Gross capital formation as % of GDP (CAP/GDP)                 | Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements; plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and "work in progress." |
| Net ODA as % of GNI (ODA/GNI)                                 | Net official development assistance received as a percentage of gross national income   |
| Regulatory Quality (REGQUAL)                                  | This index captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. It is based on survey respondents and experts in the public and private sectors, as well as various NGOs. With zero mean, unit standard deviation, it ranges approximately from -2.5 to 2.5.   |

| Data from OECD CRS                                      |   |
|---|---|
| Variable  | Description   |
| Log of Aid for Trade (LnAFT)                            | Natural log of sum of all official development aid and official other flows disbursed in the 200.Economic Infrastructure and Services and 300.Production Sectors of OECD-CRS database.  |
| Log of Aid for Economic Infrastructure (LnINFRA)        | Natural log of sum of all official development aid and official other flows disbursed in the 210.Transport and Storage, 220.Communications and 230.Energy Generation and Supply of OECD-CRS database.   |
| Log of Aid for Building Productive Capacity (LnPRODCAP) | Natural log of sum of all official development aid and official other flows disbursed in the 240.Banking and Financial Services, 250.Business and Other Services, 310.Agriculture, Forestry, Fishing, 320. Industry, Mining, Construction, and 332.Tourism of OECD-CRS database.  |
| Log of Aid for Trade Policy and Regulations (LnTRADE)   | Natural log of sum of all official development aid and official other flows disbursed in 331. Trade Policy and Regulation of OECD-CRS database.   |
| Log of Aid for Trade in the form of grant (LnGRANT)     | Natural log of sum of grants disbursed in 200.Economic Infrastructure and Services and 300.Production Sectors of OECD-CRS database. Grants are transfers in cash or in kind for which no legal debt is incurred by the recipient. For DAC/CRS reporting purposes, it also includes debt forgiveness, which does not entail new transfers; support to non-governmental organizations; and certain costs incurred in the implementation of aid programs.  |
| Log of Aid for Trade in the form of loan (LnLOAN)       | Natural log of sum of loans disbursed in 200.Economic Infrastructure and Services and 300.Production Sectors of OECD-CRS database. Loans are transfers for which the recipient incurs a legal debt and repayment is required in convertible currencies or in kind. This includes any loans repayable in the borrower's currency where the lender intends  |
| Log of Other official flows for Trade (LnOOF)           | Natural log of sum of other official flows (OOF) disbursed in 200.Economic Infrastructure and Services and 300.Production Sectors of OECD-CRS database. OOFs are defined as transactions by the official sector with countries on the DAC List of ODA Recipients which do not meet the conditions for eligibility as official development assistance, either because they are not primarily aimed at development, or because they have a grant element of less than 25%. The main classes of transactions included are official export credits, official sector equity and portfolio investment, and debt reorganization undertaken by the official sector at non-concessional terms. |

Control variables in the model and hypothesis on each variable are as follows.

(a) Trade (Export and Import): In general, more trade helps lower trading cost and time due to increasing economies of scale. Therefore, it makes easier for a country to export new exports. Nevertheless, countries heavily relying on a few resources may have high export/GDP ratio with extremely low EM. The impact of trade is therefore uncertain a priori.

(b) Savings (Capital Formation and Foreign Direct Investment (FDI)): Diversification means emergence of new industries and new production lines. Therefore, it is likely to cause accumulation of fixed capital (Habiyaemye and Zieseimer, 2006). However, it is possible that new physical capital accumulation is linked to more intensive exploitation of few primary commodities. This ambiguity can also be applied to FDI. IF FDI is mainly efficiency-seeking and labor-seeking, FDI will set up new industries that could export. FDI has been used as an efficient means of improving export diversification in resource-poor countries in the region because it introduces a new outlet of capital. If the motivation of FDI is resource-seeking, however, it leads to a more concentrated export structure.

(c) ODA: ODA dependent countries will have smaller private sectors and susceptible to Dutch disease. Therefore countries receiving higher ODA may have more concentrated, less sophisticated export structure.

(d) Government quality: The model controls the regulatory quality (Regquality), represented by the World Bank Good Governance measure on the quality of regulations that influence private sector development in a country. The better the national administration, the lower the cost and time it takes for trading. Therefore, government quality would be positively linked to export diversification. According to the OECD questionnaire, both donors and recipients agree that complementary policies matter in achieving maximum positive impact of aid for trade on trade, growth and development.

## 5. Empirical Results

### (1) Pooled Regression

First, Ordinary least squares (OLS) regression is run without country fixed-effects. This allows checking if the hypothesis holds true between different countries for a larger number of observations. The result shows that EM increases as countries GDPPC, EX/GDP, FDI/GDP, CAP/GDP, REGQUAL, and LnAFT increase. ODA/GNI is negatively related to EM as expected. LnIM increases as GDPPC, EX/GDP, LnAFT increase. IM/GDP, FDI/GDP, ODA/GNI have negative coefficient and REGQUAL does not influence LnIM as IM measures size of export share in the world and improving regulatory quality does not necessarily increase the relative size of the economy.

The effect of aid for trade appeared significant in all income groups. All recipient countries are considered, as countries receive 1% more aid for trade, they are able to increase EM by 0.07 and 0.584% of IM. In other words, countries receiving more aid for trade have higher EM and IM when other variables are controlled. The degrees which aid for trade affect diversification differ by income level. The impact on EM is the greatest for low income group as they initially have low EM and it may be easier to influence the export even with smaller amount of aid. The coefficient becomes smaller as income level rises. In terms of IM, coefficients are similar for low and upper middle income groups. It is highly likely that upper middle income countries have shown high coefficient due to inclusion of China in that group skewing the result drastically.

**Table 6: The Impact of AFT on EM and IM in Pooled Regression (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.001***  | -0.013    | -0.002    | -0.001**  | 0.000***  | 0.000     | 0.000***  | 0.000     |
|           | (3.371)   | (-1.054)  | (-1.286)  | (-2.248)  | (3.610)   | (0.769)   | (-3.116)  | (-1.393)  |
| EX/GDP    | 0.166***  | 0.202     | 0.231**   | -0.129    | 0.043***  | 0.058***  | 0.027***  | 0.028***  |
|           | (2.835)   | (0.742)   | (2.241)   | (-1.586)  | (10.761)  | (4.634)   | (4.444)   | (4.348)   |
| IM/GDP    | -0.005    | 0.357     | 0.061     | 0.203**   | -0.027*** | -0.017    | -0.023*** | -0.012*   |
|           | (-0.089)  | (1.399)   | (0.609)   | (2.283)   | (-6.745)  | (-1.480)  | (-3.896)  | (-1.737)  |
| FDI/GDP   | -0.595*** | -1.304**  | -0.408    | -0.414*   | -0.064*** | -0.074*** | -0.020    | -0.055*** |
|           | (-3.675)  | (-2.158)  | (-1.476)  | (-1.875)  | (-5.824)  | (-2.671)  | (-1.189)  | (-3.116)  |
| CAP/GDP   | -0.235**  | -0.955**  | -0.569*** | -0.175    | 0.010     | -0.020    | 0.02**    | 0.010     |
|           | (-2.256)  | (-2.460)  | (-3.601)  | (-1.113)  | (1.457)   | (-1.120)  | (2.081)   | (0.826)   |
| ODA/GNI   | -1.242*** | -0.725*** | -1.45***  | -3.013*** | -0.045*** | -0.003    | -0.069*** | -0.209*** |
|           | (-11.859) | (-3.258)  | (-7.629)  | (-5.144)  | (-6.393)  | (-0.245)  | (-6.067)  | (-4.483)  |
| REGQUAL   | 8.835***  | 11.302*** | 13.712*** | 4.134**   | -0.053    | -1.15***  | 0.012     | 0.188     |
|           | (6.535)   | (2.883)   | (4.343)   | (2.480)   | (-0.584)  | (-6.367)  | (0.064)   | (1.420)   |
| LnAFT     | 7.051***  | 10.317*** | 8.812***  | 7.163***  | 0.584***  | 0.748***  | 0.495***  | 0.734***  |
|           | (16.904)  | (6.939)   | (10.385)  | (12.588)  | (20.729)  | (10.919)  | (9.785)   | (16.234)  |
| C         | 41.778    | 24.803    | 41.633    | 55.733    | -10.458   | -13.149   | -9.360    | -10.263   |
|           | (11.431)  | (2.548)   | (5.542)   | (9.918)   | (-42.396) | (-29.302) | (-20.889) | (-22.997) |
| R-squared | 0.511     | 0.424     | 0.608     | 0.519     | 0.554     | 0.596     | 0.605     | 0.664     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 117       | 26        | 40        | 43        | 117       | 26        | 40        | 43        |
| Obs.      | 765       | 154       | 269       | 302       | 765       | 154       | 269       | 302       |

Note: T-statistics is shown in parenthesis. \*: significant at 10% level; \*\*: significant at 5% level; \*\*\*: significant at 1% level

## (2) Cross-section fixed effects

With the redundant fixed effect likelihood test, this model has p value of 0.000 which indicates that the fixed effects model is significant. Therefore, cross-section fixed estimation is added to the model. The results concerning total aid for trade is as below. Then, regression result for aid by sector and aid by type will be followed.

**Table 7: The Impact of AFT on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000*    | 0.013*    | -0.002    | 0.000     | 0.000     | 0.002**   | 0.000     | 0.000     |
|           | (-1.690)  | (1.851)   | (-1.130)  | (-1.305)  | (1.081)   | (2.544)   | (0.299)   | (0.492)   |
| EX/GDP    | 0.115     | 0.176     | -0.067    | 0.489***  | 0.011***  | -0.013    | 0.015*    | 0.016***  |
|           | (1.550)   | (0.979)   | (-0.477)  | (4.708)   | (2.870)   | (-0.863)  | (1.807)   | (3.454)   |
| IM/GDP    | -0.007    | 0.002     | 0.010     | 0.013     | -0.006    | 0.005     | -0.010    | -0.012**  |
|           | (-0.090)  | (0.016)   | (0.070)   | (0.117)   | (-1.547)  | (0.481)   | (-1.147)  | (-2.514)  |
| FDI/GDP   | -0.023    | -0.708*** | 0.107     | 0.193     | 0.002     | -0.009    | 0.008     | -0.001    |
|           | (-0.211)  | (-2.672)  | (0.473)   | (1.430)   | (0.281)   | (-0.416)  | (0.608)   | (-0.095)  |
| CAP/GDP   | 0.165*    | 0.163     | 0.145     | -0.021    | 0.006     | -0.019    | 0.002     | 0.019***  |
|           | (1.705)   | (0.880)   | (0.897)   | (-0.138)  | (1.214)   | (-1.255)  | (0.217)   | (2.839)   |
| ODA/GNI   | -0.162    | -0.022    | -0.41**   | 0.306     | -0.006    | 0.008     | -0.007    | 0.014     |
|           | (-1.464)  | (-0.156)  | (-2.115)  | (0.862)   | (-0.927)  | (0.650)   | (-0.588)  | (0.911)   |
| REGQUAL   | 4.474**   | 10.197*   | 8.868***  | -3.174    | 0.171*    | 0.086     | 0.069     | 0.329***  |
|           | (2.565)   | (1.858)   | (3.100)   | (-1.281)  | (1.830)   | (0.189)   | (0.412)   | (3.011)   |
| LnAFT     | 1.382***  | 3.156**   | 2.447**   | 0.741     | 0.058***  | -0.077    | 0.049     | 0.064***  |
|           | (3.336)   | (2.233)   | (2.318)   | (1.355)   | (2.626)   | (-0.655)  | (0.788)   | (2.654)   |
| C         | 52.310    | 27.082    | 56.018    | 49.895    | -8.281    | -8.506    | -8.087    | -8.217    |
|           | (16.038)  | (3.874)   | (9.074)   | (9.412)   | (-47.341) | (-14.596) | (-22.336) | (-35.119) |
| R-squared | 0.929     | 0.951     | 0.922     | 0.928     | 0.959     | 0.887     | 0.924     | 0.984     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 117       | 26        | 40        | 43        | 117       | 26        | 40        | 43        |
| Obs.      | 765       | 154       | 269       | 302       | 765       | 154       | 269       | 302       |

In similar manner with the pooled panel, if a country received more aid for trade, both EM and IM increased. 1% increase of aid for trade contributed to 1.382% increase in EM and 0.058% increase in IM. Regulatory quality also holds high coefficient in both EM and IM. It is noteworthy that FDI as % of GDP is negatively connected to diversification in low income countries. This is due to concentrated FDI in a few

industries in a country with no other major industries to invest. However, many other control variables lose explanatory power as country specific variable assumed by fixed effects is far greater than these selected factors. This is also implied by high r-squared value.

If countries are grouped separately by income, low and lower middle income countries increased EM with more aid for trade while upper middle income countries increased IM with more aid for trade. It seems that aid for trade was not a significant contributing factor in upper middle countries as they already have reached a threshold level of infrastructure, productive capacity throughout industries, and trade regulations necessary for decent level of EM. Hence, that additional aid for trade does not affect the variety of export products while it helps increase the export of already exported products.

In the case of aid for infrastructure, it appears that low and lower middle income countries benefited considerably in terms of export diversification. 1% increase of aid in building and upgrading infrastructure such as roads and ports helped to increase EM by 0.02923 and 0.02366 in 0 to 1 scale in the two groups respectively. For lower middle income high dependence on ODA was harmful for export diversification while increasing regulatory quality for private sector was advantageous.

On the contrary, exports of upper middle income countries did not diversify but increased in its share in the world market due to increased infrastructure aid. Rather than aid, it is export share in the national economy that is meaningful for diversification. 1% increase in export as % of GDP leads to rise of 0.00482 in EM in UMI.

**Table 8: The Impact of Aid for Infrastructure on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000     | 0.014**   | -0.002    | 0.000     | 0.000     | 0.001*    | 0.000     | 0.000     |
|           | (-1.186)  | (2.044)   | (-1.493)  | (-0.845)  | (1.182)   | (1.685)   | (0.457)   | (1.039)   |
| EX/GDP    | 0.134*    | 0.176     | -0.022    | 0.482***  | 0.011***  | -0.013    | 0.016*    | 0.015***  |
|           | (1.761)   | (0.985)   | (-0.160)  | (4.545)   | (2.744)   | (-0.872)  | (1.868)   | (3.332)   |
| IM/GDP    | -0.022    | -0.024    | -0.026    | 0.006     | -0.005    | 0.003     | -0.010    | -0.008    |
|           | (-0.289)  | (-0.190)  | (-0.184)  | (0.049)   | (-1.188)  | (0.338)   | (-1.197)  | (-1.606)  |
| FDI/GDP   | 0.025     | -0.662**  | 0.220     | 0.204     | 0.003     | -0.004    | 0.010     | -0.001    |
|           | (0.233)   | (-2.492)  | (0.983)   | (1.474)   | (0.552)   | (-0.193)  | (0.732)   | (-0.086)  |
| CAP/GDP   | 0.154     | 0.237     | 0.104     | -0.033    | 0.005     | -0.018    | 0.001     | 0.016**   |
|           | (1.570)   | (1.287)   | (0.652)   | (-0.212)  | (0.923)   | (-1.179)  | (0.140)   | (2.393)   |
| ODA/GNI   | -0.144    | -0.019    | -0.456**  | 0.332     | -0.006    | 0.003     | -0.006    | 0.014     |
|           | (-1.291)  | (-0.139)  | (-2.411)  | (0.920)   | (-0.998)  | (0.281)   | (-0.568)  | (0.896)   |
| REGQUAL   | 4.652***  | 8.334     | 8.998***  | -2.688    | 0.161*    | 0.046     | 0.068     | 0.325***  |
|           | (2.640)   | (1.521)   | (3.195)   | (-1.075)  | (1.717)   | (0.101)   | (0.405)   | (2.973)   |
| LnINFRA   | 0.758**   | 2.923**   | 2.366***  | -0.053    | 0.044**   | 0.124     | 0.032     | 0.035*    |
|           | (2.349)   | (2.493)   | (3.510)   | (-0.126)  | (2.567)   | (1.270)   | (0.792)   | (1.877)   |
| C         | 55.259    | 28.754    | 60.264    | 53.318    | -8.180    | -9.015    | -7.990    | -8.167    |
|           | (17.734)  | (4.471)   | (10.925)  | (10.343)  | (-49.405) | (-16.817) | (-24.328) | (-36.221) |
| R-squared | 0.928     | 0.951     | 0.924     | 0.926     | 0.959     | 0.888     | 0.924     | 0.984     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 117       | 26        | 40        | 43        | 117       | 26        | 40        | 43        |
| Obs.      | 758       | 154       | 269       | 300       | 758       | 154       | 269       | 300       |

Interestingly, aid for building productive capacity shows different result from aid for infrastructure. Although it both impacted EM and IM positively when all samples are considered, the effect is opposite of the previous case for each group. While it had no notable influence for low and lower middle income countries, it facilitated export diversification in upper middle income countries. Moreover, while all other groups fail to

increase IM using aid for productive capacity, LMI utilized aid to raise its share of already exported products. This could imply that aid in LMI focused on strengthening competitiveness of existing production whereas aid in UMI created forward linkages to different commodities and increased EM. It had no impact in LI since productive capacity cannot be enhanced in a short period of time.

**Table 9: The Impact of Aid for Building Productive Capacity on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|               | EM            |               |               |               | LnIM          |               |               |               |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|               | ALL           | LI            | LMI           | UMI           | ALL           | LI            | LMI           | UMI           |
| GDPPC         | 0.000         | 0.018***      | 0.000         | -0.001*       | 0.000         | 0.002***      | 0.000         | 0.000         |
|               | (-1.563)      | (2.652)       | (0.215)       | (-1.685)      | (1.428)       | (3.034)       | (-0.287)      | (1.291)       |
| EX/GDP        | 0.109         | 0.178         | -0.066        | 0.476***      | 0.011***      | -0.013        | 0.014*        | 0.015***      |
|               | (1.455)       | (0.974)       | (-0.459)      | (4.609)       | (2.819)       | (-0.874)      | (1.649)       | (3.333)       |
| IM/GDP        | -0.003        | 0.020         | 0.009         | 0.010         | -0.006        | 0.004         | -0.009        | -0.013**      |
|               | (-0.036)      | (0.159)       | (0.064)       | (0.092)       | (-1.538)      | (0.352)       | (-1.047)      | (-2.536)      |
| FDI/GDP       | -0.038        | -0.749***     | 0.146         | 0.161         | 0.001         | -0.008        | 0.004         | 0.000         |
|               | (-0.353)      | (-2.793)      | (0.618)       | (1.193)       | (0.205)       | (-0.387)      | (0.306)       | (-0.017)      |
| CAP/GDP       | 0.171*        | 0.157         | 0.119         | 0.007         | 0.007         | -0.017        | 0.004         | 0.018***      |
|               | (1.754)       | (0.832)       | (0.722)       | (0.045)       | (1.266)       | (-1.079)      | (0.395)       | (2.617)       |
| ODA/GNI       | -0.164        | 0.017         | -0.285        | 0.190         | -0.005        | 0.009         | -0.010        | 0.018         |
|               | (-1.473)      | (0.119)       | (-1.486)      | (0.530)       | (-0.866)      | (0.761)       | (-0.896)      | (1.120)       |
| REGQUAL       | 4.462**       | 10.638*       | 8.288***      | -3.584        | 0.181*        | -0.001        | 0.065         | 0.381***      |
|               | (2.543)       | (1.893)       | (2.857)       | (-1.447)      | (1.926)       | (-0.002)      | (0.390)       | (3.437)       |
| LnPRODCA<br>P | 1.183***      | 1.325         | 0.383         | 1.129**       | 0.042**       | -0.131        | 0.121**       | 0.016         |
|               | (3.246)       | (1.238)       | (0.439)       | (2.401)       | (2.124)       | (-1.501)      | (2.425)       | (0.782)       |
| C             | 53.940        | 33.495        | 61.388        | 50.287        | -8.191        | -8.495        | -8.222        | -8.012        |
|               | (17.324)      | (5.427)       | (10.324)      | (10.118)      | (-48.998)     | (-16.871)     | (-24.123)     | (-35.986)     |
| R-squared     | 0.929         | 0.949         | 0.920         | 0.928         | 0.959         | 0.889         | 0.925         | 0.984         |
| Years         | 2002-<br>2009 |
| Countries     | 116           | 26            | 40            | 43            | 116           | 26            | 40            | 43            |
| Obs.          | 761           | 154           | 268           | 301           | 761           | 154           | 268           | 301           |

The impact of aid for trade policy and regulations on export diversification was trivial in all groups except LMI. This may attribute to much smaller amount of this type of aid accounting only 3% of total AfT (Figure 2). Another reason could be that policy and regulations has macro perspective and does not affect the trade immediately but only in the long-run.

**Table 10: The Impact of Aid for Trade Policy and Regulations on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000     | 0.018**   | -0.001    | 0.000     | 0.000**   | 0.002***  | 0.000**   | 0.000**   |
|           | (-0.284)  | (2.532)   | (-0.768)  | (-0.655)  | (2.472)   | (4.242)   | (1.998)   | (2.564)   |
| EX/GDP    | 0.082     | 0.265     | -0.274*   | 0.519***  | 0.016***  | -0.014    | 0.024***  | 0.02***   |
|           | (0.995)   | (1.251)   | (-1.750)  | (4.041)   | (4.233)   | (-1.326)  | (2.677)   | (6.007)   |
| IM/GDP    | 0.026     | -0.076    | 0.081     | -0.025    | -0.009**  | -0.002    | -0.011    | -0.014*** |
|           | (0.317)   | (-0.506)  | (0.529)   | (-0.166)  | (-2.417)  | (-0.277)  | (-1.214)  | (-3.583)  |
| FDI/GDP   | -0.030    | -0.752**  | 0.071     | 0.148     | 0.004     | -0.012    | 0.006     | 0.009**   |
|           | (-0.255)  | (-2.482)  | (0.277)   | (0.881)   | (0.656)   | (-0.772)  | (0.431)   | (1.998)   |
| CAP/GDP   | 0.140     | 0.185     | 0.022     | 0.051     | 0.011**   | -0.002    | 0.012     | 0.013***  |
|           | (1.309)   | (0.832)   | (0.121)   | (0.262)   | (2.273)   | (-0.185)  | (1.137)   | (2.616)   |
| ODA/GNI   | -0.137    | 0.089     | -0.335    | 0.732     | -0.017*** | 0.005     | -0.022*   | -0.024    |
|           | (-1.061)  | (0.537)   | (-1.456)  | (1.226)   | (-2.777)  | (0.600)   | (-1.653)  | (-1.588)  |
| REGQUAL   | 6.042***  | 6.866     | 7.412**   | -0.167    | 0.074     | -0.097    | -0.013    | 0.22**    |
|           | (3.046)   | (0.970)   | (2.415)   | (-0.047)  | (0.799)   | (-0.275)  | (-0.074)  | (2.428)   |
| LnTRADE   | 0.290     | 0.592     | 0.742*    | -0.126    | 0.003     | -0.025    | -0.025    | 0.011     |
|           | (1.460)   | (1.458)   | (1.768)   | (-0.406)  | (0.302)   | (-1.251)  | (-1.028)  | (1.415)   |
| C         | 61.605    | 40.178    | 74.941    | 55.989    | -7.951    | -8.836    | -8.452    | -7.526    |
|           | (19.314)  | (5.770)   | (11.563)  | (10.288)  | (-53.732) | (-25.499) | (-22.469) | (-53.664) |
| R-squared | 0.930     | 0.940     | 0.925     | 0.901     | 0.971     | 0.954     | 0.932     | 0.993     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 111       | 25        | 40        | 41        | 111       | 25        | 40        | 41        |
| Obs.      | 646       | 130       | 235       | 253       | 646       | 130       | 235       | 253       |

What about the impact of aid for trade divided by its form. First, aid for trade in the form of grant was effective in diversifying the exports of low income countries. It is because what these countries receive is mostly in grant and most of grant is directed toward them. Again, regulatory quality remains as an essential factor. Grant was not an important factor determining IM of recipient countries.

**Table 11: The Impact of AfT in the Form of Grant on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000     | 0.014**   | 0.000     | 0.000     | 0.000**   | 0.002***  | 0.000     | 0.000*    |
|           | (-1.145)  | (1.996)   | (0.113)   | (-1.183)  | (1.993)   | (2.588)   | (0.634)   | (1.736)   |
| EX/GDP    | 0.098     | 0.178     | -0.070    | 0.467***  | 0.011***  | -0.013    | 0.015*    | 0.015***  |
|           | (1.313)   | (0.986)   | (-0.490)  | (4.400)   | (2.686)   | (-0.866)  | (1.801)   | (3.289)   |
| IM/GDP    | -0.008    | -0.027    | 0.010     | 0.013     | -0.006    | 0.006     | -0.010    | -0.012**  |
|           | (-0.112)  | (-0.217)  | (0.072)   | (0.113)   | (-1.472)  | (0.559)   | (-1.162)  | (-2.409)  |
| FDI/GDP   | -0.030    | -0.685**  | 0.117     | 0.182     | 0.002     | -0.010    | 0.008     | 0.001     |
|           | (-0.278)  | (-2.563)  | (0.510)   | (1.327)   | (0.334)   | (-0.453)  | (0.577)   | (0.178)   |
| CAP/GDP   | 0.164*    | 0.194     | 0.124     | -0.027    | 0.006     | -0.020    | 0.002     | 0.016**   |
|           | (1.683)   | (1.050)   | (0.759)   | (-0.175)  | (1.203)   | (-1.310)  | (0.197)   | (2.415)   |
| ODA/GNI   | -0.160    | -0.022    | -0.296    | 0.231     | -0.005    | 0.008     | -0.005    | 0.023     |
|           | (-1.436)  | (-0.154)  | (-1.545)  | (0.631)   | (-0.772)  | (0.670)   | (-0.477)  | (1.427)   |
| REGQUAL   | 4.978***  | 8.913     | 8.693***  | -3.140    | 0.206**   | 0.120     | 0.075     | 0.412***  |
|           | (2.835)   | (1.618)   | (2.972)   | (-1.250)  | (2.189)   | (0.263)   | (0.441)   | (3.703)   |
| LnGRANT   | 1.001**   | 2.527**   | 0.558     | 0.457     | 0.014     | -0.072    | 0.031     | -0.011    |
|           | (2.283)   | (2.069)   | (0.569)   | (0.708)   | (0.589)   | (-0.707)  | (0.537)   | (-0.380)  |
| C         | 55.373    | 30.471    | 61.333    | 53.068    | -8.101    | -8.568    | -8.010    | -7.965    |
|           | (18.100)  | (4.787)   | (10.524)  | (10.821)  | (-49.405) | (-16.199) | (-23.686) | (-36.691) |
| R-squared | 0.928     | 0.950     | 0.920     | 0.926     | 0.958     | 0.887     | 0.924     | 0.984     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 117       | 26        | 40        | 43        | 117       | 26        | 40        | 43        |
| Obs.      | 765       | 154       | 269       | 302       | 765       | 154       | 269       | 302       |

Similarly, loan type of aid was also useful for EM only in low income countries while there was no impact in terms of increasing IM in all groups. The coefficient of loan was greater than that of grant suggesting that the same amount of loan increased LI's EM more than the same amount of grant did in the same period. However, when all countries were considered, the impact of grant was about two times higher than that of loan.

**Table 12: The Impact of Aft in the Form of Loan on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000     | 0.016**   | -0.002    | 0.000     | 0.000***  | 0.001**   | 0.000***  | 0.000***  |
|           | (-1.142)  | (2.564)   | (-1.226)  | (-1.191)  | (3.513)   | (2.434)   | (3.341)   | (4.280)   |
| EX/GDP    | -0.014    | -0.021    | 0.095     | 0.022     | 0.009**   | -0.009    | 0.006     | 0.021***  |
|           | (-0.185)  | (-0.103)  | (0.574)   | (0.545)   | (2.095)   | (-0.517)  | (0.788)   | (5.866)   |
| IM/GDP    | 0.064     | 0.240     | -0.112    | 0.049     | -0.004    | -0.001    | 0.000     | -0.014*** |
|           | (0.861)   | (1.583)   | (-0.686)  | (1.059)   | (-0.885)  | (-0.048)  | (0.055)   | (-3.383)  |
| FDI/GDP   | -0.108    | -0.645**  | 0.064     | 0.017     | 0.008     | -0.009    | 0.025**   | 0.011**   |
|           | (-1.032)  | (-2.358)  | (0.234)   | (0.339)   | (1.331)   | (-0.382)  | (2.031)   | (2.525)   |
| CAP/GDP   | 0.138     | 0.027     | 0.228     | -0.045    | -0.002    | -0.013    | -0.011    | 0.007     |
|           | (1.480)   | (0.133)   | (1.230)   | (-0.790)  | (-0.446)  | (-0.711)  | (-1.304)  | (1.492)   |
| ODA/GNI   | -0.167    | -0.003    | -0.549*   | 0.060     | -0.004    | 0.004     | 0.013     | -0.016    |
|           | (-1.534)  | (-0.021)  | (-1.927)  | (0.475)   | (-0.718)  | (0.359)   | (1.009)   | (-1.448)  |
| REGQUAL   | 7.892***  | 12.003**  | 12.604*** | 0.587     | 0.243**   | 0.133     | 0.122     | 0.051     |
|           | (4.407)   | (2.085)   | (3.660)   | (0.568)   | (2.357)   | (0.270)   | (0.788)   | (0.569)   |
| LnLOAN    | 0.558*    | 3.927***  | 0.956     | 0.153     | 0.016     | 0.051     | -0.018    | 0.010     |
|           | (1.888)   | (3.265)   | (1.194)   | (1.327)   | (0.921)   | (0.492)   | (-0.488)  | (1.029)   |
| C         | 60.459    | 24.256    | 67.828    | 72.438    | -7.968    | -8.914    | -7.828    | -7.971    |
|           | (20.830)  | (3.641)   | (10.239)  | (41.136)  | (-47.775) | (-15.650) | (-26.233) | (-51.946) |
| R-squared | 0.950     | 0.949     | 0.901     | 0.993     | 0.970     | 0.891     | 0.950     | 0.995     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 98        | 25        | 35        | 36        | 98        | 25        | 35        | 36        |
| Obs.      | 567       | 139       | 221       | 205       | 567       | 139       | 221       | 205       |

Finally, the impact of OOF is evaluated. It had no influence in export diversification. As OOF was mostly given to UMI with more ability to pay back, it had helped increase IM of UMI. UMI that received considerable amount of OOF include China, Brazil, Turkey, Peru and India while very few countries in LI and LMI group received a minimal amount of OOF.

**Table 13: The Impact of Other Official Flows in AfT Sectors on EM and IM with Cross-Section Fixed Effects (2002-2009)**

|           | EM        |           |           |           | LnIM      |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|           | ALL       | LI        | LMI       | UMI       | ALL       | LI        | LMI       | UMI       |
| GDPPC     | 0.000     | 0.016**   | 0.000     | 0.000     | 0.000***  | 0.001     | 0.000**   | 0.000***  |
|           | (-0.390)  | (2.022)   | (-0.168)  | (-0.901)  | (3.294)   | (1.421)   | (2.237)   | (4.290)   |
| EX/GDP    | 0.308***  | 0.648***  | 0.021     | 0.527***  | 0.01***   | 0.031**   | -0.007    | 0.023***  |
|           | (3.220)   | (2.683)   | (0.140)   | (3.788)   | (2.826)   | (2.030)   | (-0.884)  | (7.349)   |
| IM/GDP    | -0.063    | -0.280    | 0.136     | 0.006     | -0.007*   | -0.034**  | 0.008     | -0.014*** |
|           | (-0.583)  | (-1.225)  | (0.820)   | (0.037)   | (-1.875)  | (-2.353)  | (0.873)   | (-3.506)  |
| FDI/GDP   | -0.025    | -0.421    | -0.179    | 0.019     | 0.015***  | -0.032    | 0.034***  | 0.01*     |
|           | (-0.166)  | (-1.164)  | (-0.868)  | (0.083)   | (2.716)   | (-1.417)  | (3.035)   | (1.939)   |
| CAP/GDP   | 0.128     | 0.339     | -0.133    | 0.050     | 0.004     | 0.042***  | -0.012    | 0.008     |
|           | (0.969)   | (1.496)   | (-0.647)  | (0.230)   | (0.798)   | (2.934)   | (-1.067)  | (1.631)   |
| ODA/GNI   | -0.089    | 0.289*    | -0.986*** | 0.707     | 0.003     | -0.003    | 0.016     | -0.006    |
|           | (-0.572)  | (1.862)   | (-4.025)  | (1.367)   | (0.563)   | (-0.291)  | (1.187)   | (-0.532)  |
| REGQUAL   | 5.17**    | -6.156    | 19.266*** | -0.820    | 0.234***  | 0.262     | 0.627***  | -0.059    |
|           | (2.277)   | (-0.607)  | (5.452)   | (-0.264)  | (2.807)   | (0.413)   | (3.224)   | (-0.824)  |
| LnOOF     | 0.191     | 0.520     | -0.525    | 0.185     | 0.034***  | 0.023     | 0.039*    | 0.021***  |
|           | (0.768)   | (0.838)   | (-1.235)  | (0.544)   | (3.678)   | (0.578)   | (1.681)   | (2.654)   |
| C         | 61.185    | 27.290    | 79.376    | 54.465    | -7.519    | -8.523    | -7.199    | -7.779    |
|           | (17.562)  | (3.291)   | (15.630)  | (9.518)   | (-58.843) | (-16.409) | (-25.751) | (-59.221) |
| R-squared | 0.935     | 0.991     | 0.960     | 0.904     | 0.987     | 0.988     | 0.971     | 0.995     |
| Years     | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 | 2002-2009 |
| Countries | 92        | 16        | 32        | 40        | 92        | 16        | 32        | 40        |
| Obs.      | 470       | 47        | 158       | 245       | 470       | 47        | 158       | 245       |

To summarize all the regression analyses, aid for trade which encompasses all sectors and all forms was a determining factor for both EM and IM. It was effective to diversify in low and lower middle income countries while it led to an increase of export share.

By its sector, low and lower middle income countries used benefits of infrastructure projects to diversify their exports while upper middle income countries increased the share of already exported products. On the other hand, productive capacity did not show any impact in low income countries in one year period. It resulted in IM increase in LMI and EM increase in UMI. Aid for trade policy and regulations was solely significant in increasing EM of LMI.

By its type, grant and loan successfully fulfilled its role of export diversification in LI. OOF was more effective in increasing EM than IM in more developed recipient countries as most of OOF was given to rapidly expanding exporting countries.

**Table 14: Summary of Regression Results**

|                              | All Recipients | Low Income | Lower Middle Income | Upper Middle Income |
|------------------------------|----------------|------------|---------------------|---------------------|
| AfT                          | EM/IM          | EM         | EM                  | IM                  |
| By Sector                    |                |            |                     |                     |
| Infrastructure               | EM/IM          | EM         | EM                  | IM                  |
| Productive Capacity          | EM/IM          | -          | IM                  | EM                  |
| Trade Policy and Regulations | -              | -          | EM                  | -                   |
| By Type                      |                |            |                     |                     |
| Grant                        | EM             | EM         | -                   | -                   |
| Loan                         | EM             | EM         | -                   | -                   |
| OOF                          | IM             | -          | IM                  | IM                  |

On the contrary to Brenton and von Uexhull's finding in 2009 that product-specific programs were most effective where there was already significant export activity, aid for trade yielded meaningful results in low income countries with weak export basis. The authors argue that the challenges of growing existing exports (increasing IM) may be more easily identified and overcome than the problems of developing and exporting new products (increasing EM). Yet, AfT generally contributed to increase of EM and IM in all groups and especially facilitating new exports in lower income groups rather than facilitating existing exports.

In addition, although aid for trade of all categories appeared efficient in increasing EM except for trade policy and regulations and OOF when all recipients are treated as a single group, the result varied when groups are separated by its income level. In many cases, low income countries were more successful in using aid for trade as a tool to diversify export while upper middle income countries tended to increase existing export commodities. Lower middle income countries showed mixed results. While some kinds were effective in terms of boosting EM, other kinds were linked to the rise of IM.

It seems that low income countries had severe bottle-neck constraints that blocked exportation of various products. Therefore, it had immediate and direct impact on eliminating some of supply-side difficulties and they easily increased EM using aid for trade. This is also true for certain degree in lower middle income countries.

However, upper middle income countries already had decent level of EM and additional aid for trade could only increase IM. Unless it was productive capacity

building projects that aimed to yield benefits in longer time span, it would be extremely difficult to further increase EM of upper middle income countries as products that they do not currently export requires extremely sophisticated technology to develop.

## 6. Conclusion

Overall, aid for trade was effective in enhancing exports of recipient countries by either increasing the sales of existing exports or by developing new products for export. The pooled regression suggests that countries receiving more aid for trade were able to increase their extensive and intensive margin in the following year, regardless of their income level. Cross-section fixed effects regression, on the other hand, shows varying result depending on the income group. While aid for trade has positive relations with both extensive and intensive margin similar to pooled regression, the impact is not uniform throughout all income groups. By its type, grant and loan tend to increase extensive margin while other official flows (OOF) boosts intensive margin. Aid for trade directed for infrastructure and productive capacity increased both EM and IM but aid for trade spent on trade policy and regulations appears to be insignificant due to its smaller scale.

Although this study proved significant relationship between aid for trade and export expansion broken down into extensive margin and intensive margin, there are some limitations. First, productive capacity is a sine qua non for the trade integration of developing countries in the medium to long-run, and must be a central feature of aid for trade. As the model only measured the impact after a year, its significance would be rigorously underestimated. However, due lack of correct data, it was impossible to measure accurate long-term impact.

Second, it is important to clarify the implications of the role of export diversification on growth and development for policies and aid-for-trade projects. If

policies and projects aiming at diversifying exports result in shifting resources into substantially less productive uses, the cost will be large and may dampen the benefits of diversification. Therefore, aid-for-trade projects and policies aiming at diversifying exports should not seek export diversification for its own sake ignoring “fundamentals” but rather aim at tackling the constraints that prevent a diversification consistent with evolving comparative advantages. Also, over-exaggeration of the effect of aid for trade may divert non-aid for trade ODA flows into aid for trade sectors. Thus, AfT volumes should increase together with overall official development assistance to avoid competition between different development cooperation areas.

Further research topic related to the impact of aid for trade may include diversification in terms of technology intensity, adding complementary case studies and qualitative analysis, impacts of aid for trade on poverty alleviation based on diversification, diversification not only on merchandise exports but also service industries, the impact of donor coordination in yielding the optimal level of aid for trade and geographical diversification.

Aid for trade may create various positive social and economic externalities that go beyond the specific areas of intervention such as technology transfers, networks among key trade-related institutions, and disseminate best practices. Therefore, there must be continuous efforts to evaluate and monitor AfT activities to improve its effectiveness and to produce the best possible development path for the international community.

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### **Online Sources**

World Bank, "Group Definitions" <http://data.worldbank.org/about/country-classifications>

## Appendix A. List of Countries by Income Group

| Low Income (35)          | Lower Middle Income (54) | Upper Middle Income (47) |
|--------------------------|--------------------------|--------------------------|
| Afghanistan              | Angola                   | Albania                  |
| Bangladesh               | Armenia                  | Algeria                  |
| Benin                    | Belize                   | American Samoa           |
| Burkina Faso             | Bhutan                   | Antigua and Barbuda      |
| Burundi                  | Bolivia                  | Argentina                |
| Cambodia                 | Cameroon                 | Azerbaijan               |
| Central African Republic | Cape Verde               | Belarus                  |
| Chad                     | Congo, Rep.              | Bosnia and Herzegovina   |
| Comoros                  | Cote d'Ivoire            | Botswana                 |
| Congo, Dem. Rep.         | Djibouti                 | Brazil                   |
| Eritrea                  | Egypt, Arab Rep.         | Bulgaria                 |
| Ethiopia                 | El Salvador              | Chile                    |
| Gambia, The              | Fiji                     | China                    |
| Guinea                   | Georgia                  | Colombia                 |
| Guinea-Bissau            | Ghana                    | Costa Rica               |
| Haiti                    | Guatemala                | Cuba                     |
| Kenya                    | Guyana                   | Dominica                 |
| Korea, Dem. Rep.         | Honduras                 | Dominican Republic       |
| Kyrgyz Republic          | India                    | Ecuador                  |
| Liberia                  | Indonesia                | Gabon                    |
| Madagascar               | Iraq                     | Grenada                  |
| Malawi                   | Kiribati                 | Iran, Islamic Rep.       |
| Mali                     | Kosovo                   | Jamaica                  |
| Mozambique               | Lao PDR                  | Jordan                   |
| Myanmar                  | Lesotho                  | Kazakhstan               |
| Nepal                    | Marshall Islands         | Latvia                   |
| Niger                    | Mauritania               | Lebanon                  |
| Rwanda                   | Micronesia, Fed. Sts.    | Libya                    |
| Sierra Leone             | Moldova                  | Lithuania                |
| Somalia                  | Mongolia                 | Macedonia, FYR           |
| Tajikistan               | Morocco                  | Malaysia                 |
| Tanzania                 | Nicaragua                | Maldives                 |
| Togo                     | Nigeria                  | Mauritius                |
| Uganda                   | Pakistan                 | Mayotte                  |
| Zimbabwe                 | Papua New Guinea         | Mexico                   |
|                          | Paraguay                 | Montenegro               |
|                          | Philippines              | Namibia                  |
|                          | Samoa                    | Palau                    |

|  |                       |                                |
|--|-----------------------|--------------------------------|
|  | Sao Tome and Principe | Panama                         |
|  | Senegal               | Peru                           |
|  | Solomon Islands       | Romania                        |
|  | Sri Lanka             | Russian Federation             |
|  | Sudan                 | Serbia                         |
|  | Swaziland             | Seychelles                     |
|  | Syrian Arab Republic  | South Africa                   |
|  | Timor-Leste           | St. Kitts and Nevis            |
|  | Tonga                 | St. Lucia                      |
|  | Turkmenistan          | St. Vincent and the Grenadines |
|  | Tuvalu                | Suriname                       |
|  | Ukraine               | Thailand                       |
|  | Uzbekistan            | Tunisia                        |
|  | Vanuatu               | Turkey                         |
|  | Vietnam               | Uruguay                        |
|  | West Bank and Gaza    | Venezuela, RB                  |
|  | Yemen, Rep.           |                                |
|  | Zambia                |                                |

## Appendix B. List of OECD CRS Purpose Codes for Aid for Trade

### a) Economic Infrastructure

|              |   |   |
|--------------|---|---|
| <b>210</b>   | <b>TRANSPORT AND STORAGE</b>                        | Note: Manufacturing of transport equipment should be included under code 32172.   |
| <b>21010</b> | Transport policy and administrative management      | Transport sector policy, planning and programmes; aid to transport ministries; institution capacity building and advice; unspecified transport; activities that combine road, rail, water and/or air transport. |
| <b>21020</b> | Road transport                                      | Road infrastructure, road vehicles; passenger road transport, motor passenger cars.   |
| <b>21030</b> | Rail transport                                      | Rail infrastructure, rail equipment, locomotives, other rolling stock; including light rail (tram) and underground systems.   |
| <b>21040</b> | Water transport                                     | Harbours and docks, harbour guidance systems, ships and boats; river and other inland water transport, inland barges and vessels.   |
| <b>21050</b> | Air transport                                       | Airports, airport guidance systems, aeroplanes, aeroplane maintenance equipment.  |
| <b>21061</b> | Storage   | Whether or not related to transportation.   |
| <b>21081</b> | Education and training in transport and storage     |   |
| <b>220</b>   | <b>COMMUNICATION</b>                                |   |
| <b>22010</b> | Communications policy and administrative management | Communications sector policy, planning and programmes; institution capacity building and advice; including postal services development; unspecified communications activities.                                  |
| <b>22020</b> | Telecommunications                                  | Telephone networks, telecommunication satellites, earth stations.   |
| <b>22030</b> | Radio/television/print media                        | Radio and TV links, equipment; newspapers; printing and publishing.   |
| <b>22040</b> | Information and communication technology (ICT)      | Computer hardware and software; internet access; IT training.<br>When sector cannot be specified.   |
| <b>230</b>   | <b>ENERGY GENERATION AND SUPPLY</b>                 |   |
| <b>23010</b> | Energy policy and administrative management         | Energy sector policy, planning and programmes; aid to energy ministries; institution capacity building and advice; unspecified energy activities including energy conservation.                                 |
| <b>23020</b> | Power generation/non-renewable sources              | Thermal power plants including when heat source cannot be determined; combined gas-coal power plants.   |
| <b>23030</b> | Power generation/renewable sources                  | Including policy, planning, development programmes, surveys and incentives. Fuelwood/ charcoal production should be included under forestry (31261).  |
| <b>23040</b> | Electrical transmission/                            | Distribution from power source to end user; transmission lines.   |

|       |                             |   |
|-------|-----------------------------|---|
|       | distribution                |   |
| 23050 | Gas distribution            | Delivery for use by ultimate consumer.  |
| 23061 | Oil-fired power plants      | Including diesel power plants.  |
| 23062 | Gas-fired power plants      |   |
| 23063 | Coal-fired power plants     |   |
| 23064 | Nuclear power plants        | Including nuclear safety.   |
| 23065 | Hydro-electric power plants | Including power-generating river barges.  |
| 23066 | Geothermal energy           |   |
| 23067 | Solar energy                | Including photo-voltaic cells, solar thermal applications and solar heating.  |
| 23068 | Wind power                  | Wind energy for water lifting and electric power generation.  |
| 23069 | Ocean power                 | Including ocean thermal energy conversion, tidal and wave power.  |
| 23070 | Biomass                     | Densification technologies and use of biomass for direct power generation including biogas, gas obtained from sugar cane and other plant residues, anaerobic digesters. |
| 23081 | Energy education/training   | Applies to all energy sub-sectors; all levels of training.  |
| 23082 | Energy research             | Including general inventories, surveys.   |

b) Building Productive Capacity

|            |  |   |
|------------|--|---|
| <b>240</b> | <b>BANKING AND FINANCIAL SERVICES</b>                |   |
| 24010      | Financial policy and administrative management       | Finance sector policy, planning and programmes; institution capacity building and advice; financial markets and systems.  |
| 24020      | Monetary institutions                                | Central banks.  |
| 24030      | Formal sector financial intermediaries               | All formal sector financial intermediaries; credit lines; insurance, leasing, venture capital, etc. (except when focused on only one sector).   |
| 24040      | Informal/semi-formal financial intermediaries        | Micro credit, savings and credit co-operatives etc.   |
| 24081      | Education/training in banking and financial services |   |
| <b>250</b> | <b>BUSINESS AND OTHER SERVICES</b>                   |   |
| 25010      | Business support services and institutions           | Support to trade and business associations, chambers of commerce; legal and regulatory reform aimed at improving business and investment climate; private sector institution capacity building and advice; trade information; public-private sector networking including trade fairs; e-commerce. Where sector cannot be specified: general support to private sector enterprises (in particular, use code 32130 for enterprises in the industrial sector). |
| 25020      | Privatisation  | When sector cannot be specified. Including general state enterprise restructuring or demonopolisation programmes; planning, programming, advice.  |

|              |  |   |
|--------------|--|---|
| <b>311</b>   | <b>AGRICULTURE</b>                                 |   |
| <b>31110</b> | Agricultural policy and administrative management  | Agricultural sector policy, planning and programmes; aid to agricultural ministries; institution capacity building and advice; unspecified agriculture.   |
| <b>31120</b> | Agricultural development                           | Integrated projects; farm development.  |
| <b>31130</b> | Agricultural land resources                        | Including soil degradation control; soil improvement; drainage of water logged areas; soil desalination; agricultural land surveys; land reclamation; erosion control, desertification control.             |
| <b>31140</b> | Agricultural water resources                       | Irrigation, reservoirs, hydraulic structures, ground water exploitation for agricultural use.   |
|              |  |   |
| <b>31150</b> | Agricultural inputs                                | Supply of seeds, fertilizers, agricultural machinery/equipment.   |
| <b>31161</b> | Food crop production                               | Including grains (wheat, rice, barley, maize, rye, oats, millet, sorghum); horticulture; vegetables; fruit and berries; other annual and perennial crops. [Use code 32161 for agro-industries.]             |
| <b>31162</b> | Industrial crops/export crops                      | Including sugar; coffee, cocoa, tea; oil seeds, nuts, kernels; fibre crops; tobacco; rubber. [Use code 32161 for agro-industries.]  |
| <b>31163</b> | Livestock  | Animal husbandry; animal feed aid.  |
| <b>31164</b> | Agrarian reform                                    | Including agricultural sector adjustment.   |
| <b>31165</b> | Agricultural alternative development               | Projects to reduce illicit drug cultivation through other agricultural marketing and production opportunities (see code 43050 for non-agricultural alternative development).                                |
| <b>31166</b> | Agricultural extension                             | Non-formal training in agriculture.   |
| <b>31181</b> | Agricultural education/training                    |   |
| <b>31182</b> | Agricultural research                              | Plant breeding, physiology, genetic resources, ecology, taxonomy, disease control, agricultural bio-technology; including livestock research (animal health, breeding and genetics, nutrition, physiology). |
| <b>31191</b> | Agricultural services                              | Marketing policies & organisation; storage and transportation, creation of strategic reserves.  |
| <b>31192</b> | Plant and post-harvest protection and pest control | Including integrated plant protection, biological plant protection activities, supply and management of agrochemicals, supply of pesticides, plant protection policy and legislation.                       |
| <b>31193</b> | Agricultural financial services                    | Financial intermediaries for the agricultural sector including credit schemes; crop insurance.  |
| <b>31194</b> | Agricultural co-operatives                         | Including farmers' organisations.   |
| <b>31195</b> | Livestock/veterinary services                      | Animal health and management, genetic resources, feed resources.  |
| <b>312</b>   | <b>FORESTRY</b>                                    |   |
| <b>31210</b> | Forestry policy and administrative management      | Forestry sector policy, planning and programmes; institution capacity building and advice; forest surveys; unspecified forestry and agro-forestry activities.   |
| <b>31220</b> | Forestry development                               | Afforestation for industrial and rural consumption; exploitation and utilisation; erosion control, desertification control; integrated  |

|       |  |   |
|-------|--|---|
|       |  | forestry projects.  |
| 31261 | Fuelwood/charcoal                                    | Forestry development whose primary purpose is production of fuelwood and charcoal.  |
| 31281 | Forestry education/training                          |   |
| 31282 | Forestry research                                    | Including artificial regeneration, genetic improvement, production methods, fertilizer, harvesting.   |
| 31291 | Forestry services                                    |   |
| 313   | <b>FISHING</b>                                       |   |
| 31310 | Fishing policy and administrative management         | Fishing sector policy, planning and programmes; institution capacity building and advice; ocean and coastal fishing; marine and freshwater fish surveys and prospecting; fishing boats/equipment; unspecified fishing activities. |
| 31320 | Fishery development                                  | Exploitation and utilisation of fisheries; fish stock protection; aquaculture; integrated fishery projects.   |
| 31381 | Fishery education/training                           |   |
| 31382 | Fishery research                                     | Pilot fish culture; marine/freshwater biological research.  |
| 31391 | Fishery services                                     | Fishing harbours; fish markets; fishery transport and cold storage.   |
| 321   | <b>INDUSTRY</b>                                      |   |
| 32110 | Industrial policy and administrative management      | Industrial sector policy, planning and programmes; institution capacity building and advice; unspecified industrial activities; manufacturing of goods not specified below.   |
| 32120 | Industrial development                               |   |
| 32130 | Small and medium-sized enterprises (SME) development | Direct support to the development of small and medium-sized enterprises in the industrial sector, including accounting, auditing and advisory services.   |
| 32140 | Cottage industries and handicraft                    |   |
| 32161 | Agro-industries                                      | Staple food processing, dairy products, slaughter houses and equipment, meat and fish processing and preserving, oils/fats, sugar refineries, beverages/tobacco, animal feeds production.   |
| 32162 | Forest industries                                    | Wood production, pulp/paper production.   |
| 32163 | Textiles, leather and substitutes                    | Including knitting factories.   |
| 32164 | Chemicals  | Industrial and non-industrial production facilities; includes pesticides production.  |
| 32165 | Fertilizer plants                                    |   |
| 32166 | Cement/lime/plaster                                  |   |
| 32167 | Energy manufacturing                                 | Including gas liquefaction; petroleum refineries.   |
| 32168 | Pharmaceutical production                            | Medical equipment/supplies; drugs, medicines, vaccines; hygienic products.  |
| 32169 | Basic metal industries                               | Iron and steel, structural metal production.  |
| 32170 | Non-ferrous metal industries                         |   |
| 32171 | Engineering  | Manufacturing of electrical and non-electrical machinery,   |

|       |   |   |
|-------|---|---|
|       |   | engines/turbines.   |
| 32172 | Transport equipment industry                        | Shipbuilding, fishing boats building; railroad equipment; motor vehicles and motor passenger cars; aircraft; navigation/guidance systems.   |
| 32182 | Technological research and development              | Including industrial standards; quality management; metrology; testing; accreditation; certification.   |
| 322   | <b>MINERAL RESOURCES AND MINING</b>                 |   |
| 32210 | Mineral/mining policy and administrative management | Mineral and mining sector policy, planning and programmes; mining legislation, mining cadastre, mineral resources inventory, information systems, institution capacity building and advice; unspecified mineral resources exploitation. |
| 32220 | Mineral prospection and exploration                 | Geology, geophysics, geochemistry; excluding hydrogeology (14010) and environmental geology (41010), mineral extraction and processing, infrastructure, technology, economics, safety and environment management.                       |
| 32261 | Coal  | Including lignite and peat.   |
| 32262 | Oil and gas   | Petroleum, natural gas, condensates, liquefied petroleum gas (LPG), liquefied natural gas (LNG); including drilling and production.   |
| 32263 | Ferrous metals                                      | Iron and ferro-alloy metals.  |
| 32264 | Nonferrous metals                                   | Aluminium, copper, lead, nickel, tin, zinc.   |
| 32265 | Precious metals/materials                           | Gold, silver, platinum, diamonds, gemstones.  |
| 32266 | Industrial minerals                                 | Baryte, limestone, feldspar, kaolin, sand, gypsum, gravel, ornamental stones.   |
| 32267 | Fertilizer minerals                                 | Phosphates, potash.   |
| 32268 | Offshore minerals                                   | Polymetallic nodules, phosphorites, marine placer deposits.   |
| 323   | <b>CONSTRUCTION</b>                                 |   |
| 32310 | Construction policy and administrative management   | Construction sector policy and planning; excluding construction activities within specific sectors (e.g., hospital or school construction).   |
| 332   | <b>TOURISM</b>                                      |   |
| 33210 | Tourism policy and administrative management        |   |

c) Trade Policy and Regulations

|       |  |   |
|-------|--|---|
| 331   | <b>TRADE POLICY AND REGULATIONS AND TRADE-RELATED ADJUSTMENT</b> |   |
| 33110 | Trade policy and administrative management                       | Trade policy and planning; support to ministries and departments responsible for trade policy; trade-related legislation and regulatory reforms; policy analysis and implementation of multilateral trade agreements e.g. technical barriers to trade and sanitary and phytosanitary measures (TBT/SPS) except at regional level (see |

|              |                                  |   |
|--------------|----------------------------------|---|
|              |                                  | 33130); mainstreaming trade in national development strategies (e.g. poverty reduction strategy papers); wholesale/retail trade; unspecified trade and trade promotion activities.  |
| <b>33120</b> | Trade facilitation               | Simplification and harmonisation of international import and export procedures (e.g. customs valuation, licensing procedures, transport formalities, payments, insurance); support to customs departments; tariff reforms.  |
| <b>33130</b> | Regional trade agreements (RTAs) | Support to regional trade arrangements [e.g. Southern African Development Community (SADC), Association of Southeast Asian Nations (ASEAN), Free Trade Area of the Americas (FTAA), African Caribbean Pacific/European Union (ACP/EU)], including work on technical barriers to trade and sanitary and phytosanitary measures (TBT/SPS) at regional level; elaboration of rules of origin and introduction of special and differential treatment in RTAs. |
| <b>33140</b> | Multilateral trade negotiations  | Support developing countries' effective participation in multilateral trade negotiations, including training of negotiators, assessing impacts of negotiations; accession to the World Trade Organisation (WTO) and other multilateral trade-related organisations.   |
| <b>33150</b> | Trade-related adjustment         | Contributions to the government budget to assist the implementation of recipients' own trade reforms and adjustments to trade policy measures by other countries; assistance to manage shortfalls in the balance of payments due to changes in the world trading environment.   |
| <b>33181</b> | Trade education/training         | Human resources development in trade not included under any of the above codes. Includes university programmes in trade.  |

**Korean Abstract (국문초록)**

# 무역을 위한 원조가 수원국의 수출 다변화에 미치는 영향

김 유 리

서울대학교 국제대학원

국제학과 국제협력전공

무역을 위한 원조는 2005 년 홍콩 장관회의에서 처음 도입된 이후 무역 활성화, 경제 발전 및 사회 개발의 도구로써 그 중요성이 강조되어 왔다. 무역을 위한 원조는 많은 학자들과 여러 개발 주체들의 관심사가 되었고 무역을 위한 원조가 개발도상국의 무역 증대에 미치는 영향에 대한 연구가 이어졌다. 그러나 무역을 위한 원조가 단순히 수출액의 증가에 미치는 영향이 아닌 수출 다변화에 미치는 영향에 대한 연구는 극히 드물다. 이에 본 논문은 무역을 위한 원조로 인한 수출의 증가를 수출 다양도와 집약도라는 지표를 사용하여 두 부분으로 나눈 후 수출 품목의 다양한 정도를 측정하는 수출 다양도와 무역을 위한 원조와의 상관관계를

측정하였다. 또한 무역을 위한 원조를 받는 수원국은 다양한 국가로 구성되어 있기 때문에 소득수준별로 그룹으로 나누어 회귀분석을 실시하였다. 분석결과, 대체적으로 무역을 위한 원조는 2002 년부터 2009 년 사이 수원국의 수출을 다변화시켰던 것으로 나타났다. 통합 회귀분석의 결과를 살펴보면 무역을 위한 원조를 많이 받았던 국가일수록 소득수준과 상관 없이 그 다음해의 수출다양도와 집약도가 더 높게 나타난 것을 알 수 있다. 반면 국가별 상황을 고려한 고정효과 모형의 경우, 무역을 위한 원조가 수출다변화에 긍정적인 영향을 미치는 경우도 있었으나 소득수준, 원조의 종류 및 분야에 따라 그 정도가 다르게 나타났고 영향이 없는 그룹도 있었다.

**주요어:** 무역을 위한 원조, 수출다변화, 원조 효과성, 수출다양도, 수출집약도

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