Senior Project
Department of Economics

"Does Foreign Aid Affect the Exports of the Recipient Country?"

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Abstract

This paper estimates the effect of foreign aid on exports. I use a sample of 28 African countries for a period of 10 years. I find that on average across these countries a 1 percent increase in the Aid receipts is associated with a decrease in exports by 7 percent all else held constant. The estimations for foreign aids effect on RER is not precise based on the estimations in this paper. The path analysis estimates show that while aid has an indirect effect on exports, the direct effect (possibly due to an export bias)in absolute values is larger (-0.0903) than its indirect effect (0.0118) through real exchange rate appreciation.

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Introduction

As the world pushes for globalization and more integration, developed countries are helping developing countries achieve higher standards of living. They may do this through development assistance or foreign aid. This assistance however cannot go on indefinitely as aid is meant as a temporary relief tool until these developing countries can sustain themselves. Sadly some of the poorest African countries have been receiving aid since the 1960's and have seen very little or even declining growth rates (Malik, 2008). The continent would have to find a means of sustaining itself and decreasing dependence on aid from abroad. A way they can do this is through trade. One can argue that the South-East Asian countries experienced economic growth due to their high exports (Lee and Pan, 2000). African countries can follow suit by expanding their exports in hopes of achieving similar success in economic growth.

One of the Millennium Development Goals (MDG) of the United Nations (UN) is to provide developing countries with greater access to developed country's markets. This is aimed at encouraging exports from developing nations to developed countries. Also in 2001, the European Union (EU) introduced the Everything But Arms initiative (EBA), a preferential fiscal treatment that makes goods that are exported by developing countries to the EU tariff-free. The amount of non-oil and non-arms exports from developing countries duty free to developed countries increased from 58% in 1998 to 80% in 2008 (UN Report on MDG's, 2010). This increase in duty free exports however does not imply a higher export share in the world market for all developing countries. In particular, Africa's share of total world exports decreased from 4.1 percent in 1981 to 1.7 percent in 1998, and rose slightly to 2.4 percent in 2009. This slight increase in Africa's exports of

duty free goods is instead due to fewer restrictions to trade as a result of the new EU initiative.

Despite these attempts to help the exports of developing countries and African countries in particular, they have been performing badly even in recent years. For example, Gabon's exports grew by 10.49 percent from 1950 to 1960 but grew only by 11 percent from 1960 to 2010 and by an estimated 14 percent from 2000 to 2010. The same is not the case for a country like Gambia which saw positive growth in its exports and a decline as time went on. The country had export growth of 1.27 percent from 1950 to 1960 and experienced a decline to 5.37 percent in 1980 and grew by an estimated 2.74 percent from 2000-2010 (United Nations Conference on Trade and Development UNCTAD, database). With the enactment of the MGD's in 2000, their exports seem to have improved.

Though foreign aid can be used to manufacture goods locally that act as substitutes for imports and then can also be exported, it is instead mostly used to satisfy domestic demand. That is, foreign aid is used to import goods that can be consumed in that recipient country. This could be a reason why the export performance in these countries is low. Sometimes, a foreign aid donor country may 'tie the aid' which means that the recipient country must use the aid for the purpose specified by the donor country. For example, a donor could state that the recipient country must use a certain percent of the aid to import goods from the donor country. Thus these recipient countries import goods they could be producing at home. As they produce less at home, their exports decrease and consequently export performance decreases as well.

Another factor that needs to be considered is that foreign aid can cause an appreciation of the real exchange rate. Whether tied or not, foreign aid increases in the amount of foreign currency available to the recipient country. This increase in the foreign currency supply can lead to the appreciation of the real exchange rate if the demand for the foreign currency does not rise as supply rises and prices both at home and abroad remain the same. As the real exchange rate appreciates, it becomes cheaper to import goods from the donor country and the rest of the world. As pointed out before, cheaper imports imply more expensive exports of the same sort of good. Foreign aid therefore can be a hindrance to their ability to export more.

The majority of literature available on aid and trade focus mainly on the effects of aid on the exports of the donor country; little focus has been given to the effects of this aid on the exports of the recipient country. More needs to be done on the subject and this paper intends to fill this gap. It is important to note also that foreign aid is temporary and is not expected to be received forever, thus effort should be made to improve export performance. In this paper I will test if the size of foreign aid decreases the export performance of the recipient country. This paper improves the existing literature by determining the indirect effect foreign aid may have on exports through exchange rate appreciation and the direct effects it may have on exports as well as the total effects.

Literature Review

Prior to 1952, the literature on transfers assumed that the terms of trade i.e. the ratio of export price index to import price index of the donor country would deteriorate

with respect to that of the recipient country. However Samuelson (1952) concluded that the terms of trade of the donor country was not worsened by the transfer and subsequently welfare was not affected. In fact the terms of trade of the donor country were not predicted to shift in any direction as a result of the transfer (Samuelson, 1954). In a later study by Jones (1970), he found that the transfer actually increased the terms of trade of the donor country which is different from results of previous studies. It increased the terms of trade of the donor country because as a result of aid received the recipient country could import more from the donor country. As the donor country's exports increase, prices of its exports increase because demand for their exports is higher. The terms of trade improves because the ratio of the export price index to import price index increases for the donor country.

Another study found that the recipient country could be left worse off as the donor's terms of trade increases (Kemp and Kojima, 1985). This means that as the recipient country imported more from the donor country, their terms of trade worsens as the export price index decreases and its import price index increases. Not all aid is tied but tied aid can act as a form of export subsidy used by the government of the donor country to increase the market share of its exporters in developing and LDC markets (Kemp, 2005). This tied aid can also impose additional costs on the recipient country by increasing the prices of the imports associated with the tying of such aid (Osei, 2005). This increase in prices leads to a decrease in the terms of trade of the recipient country corroborating Kemps results.

In addition to worsening the terms of trade and welfare, excessive amounts of foreign aid could lead to the neglect of some sectors of the recipient country's economy.

This aid could be used to satisfy domestic demand through increased imports while production of goods domestically that could be exported would be neglected as resources would be allocated to imports (van Wijnbergen, 1985). These large amounts of aid could create a dependence on foreign aid and lead to the so called "Dutch disease" where less importance is placed on exports as the aid dependence increases.

Van Wijnbergen also found empirical evidence suggesting that foreign aid causes an appreciation of the real exchange rate which in turn causes an increase the price of exports. In the case of Kenya his results show that an increase in foreign aid received by a dollar causes a change in the real exchange rate with an elasticity of 0.44 in the first year and 0.66 in the second year.

In line with van Wijnbergen, Elbadawi's results show that, an increase in the aid/GNP ratio by 35 percent would lead to a 3 percent overvaluation in the real exchange rate. This was true for a sample of 62 developing countries from different continents over three different periods 1984-5, 1899-90 and 1994-5. In low income sub Saharan African countries like Tanzania and Zambia, he finds that an aid/GNP ratio greater than 22 percent results in an overvaluation of the real exchange rate by 2 percent each year. This is not far removed from the full sample results. African countries he explained were net debtors and as such had weaker currencies which made temporary shocks in the real exchange rate very costly to their export performance.

To find the optimum aid/GNP ratio that would maximize exports, Elbadawi constructs a Laffer curve and finds that a country whose ratio of aid to GNP is greater than 22 percent is aid dependent. They are defined as aid dependent because a high percent of their GNP was composed of foreign aid receipts. Most of these were low

income sub-Saharan African countries. He concludes that these countries would need an orderly and smooth transition to lower aid dependence if they want their export performance to improve.

Empirical Model

This paper draws from the theoretical framework of van Wijnbergen (1987) and that of Elbadawi (1999). These two papers have similar theoretical models which are modified for the purpose of this paper. Foreign aid receipts increases the resources available for the recipient and shifts its budget constraint outwards. Policy makers may choose to allocate these resources to satisfying domestic demand through increased imports. They can also use these funds to foster the production of goods that could be exported in the world market.

Since foreign aid would come into the recipient country in the form of foreign currency, it would increase the foreign exchange reserve of the recipient country. This means that there would be an increase in the supply of the foreign currency, while demand for the foreign currency may remain the same. As a result the price of the foreign currency decreases causing the real exchange rate of the recipient country to appreciate, assuming prices at home and abroad stay the same (van Wijnbergen 1985). As the real exchange rate appreciates, imports from the donor country and the rest of the world are cheaper. Since imports are cheap, it would be better to import rather than produce these imported goods at home. Hence production of goods that act as import substitutes and can also be exported is less profitable than imports. This decreases the volume of goods

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exported. So receipts of foreign aid indirectly affect the exports of the country by appreciating the real exchange rate.

On the other hand, foreign aid can have a direct effect on exports by causing an anti-export bias. This export bias is due to the migration of labor from the traded sector (the sector of the economy engaged in production of goods that can be exported) to the non-traded sector. Van Wijnbergen explains that increases in real aid flows leads to an increase in domestic demand. This demand is satisfied by importing goods as foreign aid increases the amount of foreign exchange flows into the country which is used to facilitate the imports. Import prices then increase as demand rises and the country faces an increase in wages in the imports and services sector. This causes a decrease in wages in the exports sector. Exports become less profitable as labor migrates to the other sectors in search of the higher wages. Export performance i.e. the ratio of exports to total gross domestic product decreases as labor costs increase in the exports sector. When labor costs in the traded sector increase, production of goods for exports become more expensive and less profitable as such volume of exports decrease and export performance with it.

I include in the model other factors that could affect the exports besides the real exchange rate such as investments, government expenditure, infrastructure and resources available. While it has been suggested that foreign aid has an indirect effect on exports, it would be interesting to find if it also has a direct effect on exports. Hence, I employ path analysis in this paper to determine how aid received affects exports. Path analysis makes it possible to decompose the effects of aid on exports into the direct and indirect effects. Direct effect of aid is the effect on exports as a result of aid alone. The indirect effect of aid is the effects on exports through the real exchange rate appreciation. Justification for

the use of this method is based in the successful results of Lau and Tan (2003) that used this method to observe the direct and indirect effects of budget analysis, budgetary participation and job-relevant information on job satisfaction. Also Baldwin and Borelli (2008) obtained the direct and indirect effects of education on economic growth in the United States using path analysis.
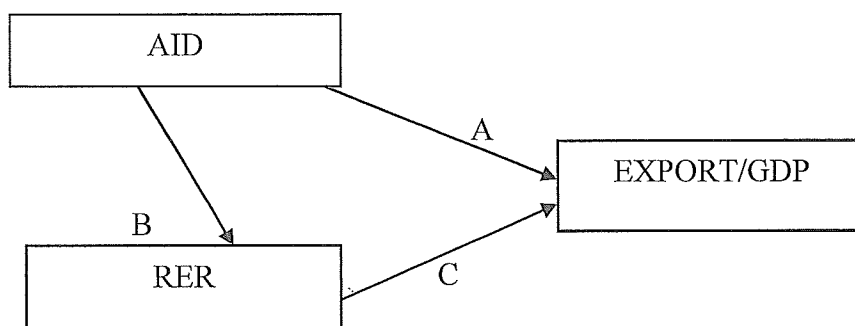

Figure 1: Path Model

From figure 1, AID is the foreign aid received from the Organization for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC). Exports are the non-oil exports of country, GDP is the gross domestic product of country and RER is the real exchange rate. A represents the direct effects of AID on export performance and B shows the indirect effect AID has on export performance through RER and also its direct effect on RER. C is the total effect of RER on export performance and may also capture parts of the indirect effects of AID on exports.

The following equations are used to determine the effects of aid on the real exchange rate and export performance

$$RER_{i,t} = \alpha_0 + \alpha_1 AID_{i,t} + \alpha_2 Z_{i,t} + \mathcal{E}_{i,t} \tag{1}$$

$$Export/GDP_{i,t} = \beta_0 + \beta_1 AID_{i,t} + \beta_2 RER_{i,t} + \beta_3 X_{i,t} + \mathcal{E}_{i,t} \tag{2}$$

Where Export/GDP is defined as the total non-oil exports of goods from country i at time t as a percent of its gross domestic product (GDP). Non-oil exports exclude all exports of oil and gas products. AID is the main independent variable and is the ratio of foreign aid received by country i at time t to the GDP of country i at time t. It is expected to have a negative effect on Export performance. RER is the real exchange rate of country i at time t which is also expected to have a negative effect on exports. Z is a group of variables that are likely to affect real exchange rate. It includes: OPEN, which is the openness of the country to trade. It is measured as the ratio of the sum of total exports and imports of country i at time t to GDP. This affects the price at which they can trade and affects RER positively. TOT is the terms of trade of country i at time t; it is expected to affect export performance negatively as a higher terms of trade implies a higher exports price. *Prod* is the ratio of the home country's per capita income to that of OECD countries and affects RER negatively; Δ*Reserves* is the change in the reserves of country i at time t as a percent of GDP, it is expected to affect RER positively. *GovExp* is the percent of GDP spent on government consumption and affects RER negatively. *FDI* is the foreign direct investment received by country i in year t and is a proxy for foreign capital inflow; it is expected to affect the real exchange rate negatively. X is a group of variables that affects exports and includes: imported capital and the aggregate per capita GDP in OECD countries. Imported capital data could not be obtained so I used imported machinery and equipment as a proxy; it is expected to affect exports positively. *OECDgdp* is a proxy for external demand for the exports and should affect exports positively.

Data

In doing the quantitative estimations for this paper I came across a number of problems regarding data and its availability thereof. Data was collected for 33 countries, five of those countries had only two years or less of data reported on exports or imported capital and so were removed from the data pool. A panel of 28 African countries from 2000 to 2009 is used in this paper. The countries include low and middle income countries. Table 1 is a complete list of all countries used in this study. I computed the RER values with the nominal exchange rate and CPI's of the countries, using the U.S dollar as the foreign currency. Table 2 is a list of all variables used and their complete definitions. Ordinary Least Squares (OLS) regressions were run for all the models. In this paper fixed effects are controlled for in further analysis.

Empirical Results

Some of the results from estimation so far are in line with previous findings while others are not. First I explain the results from the Ordinary Least Squares (OLS) estimation for exports and the RER. Next, the results from the Fixed Effects estimations of both exports and RER are discussed. Lastly, the path analysis estimations are introduced.

Estimation Results for Exports

Table 4 shows the results from OLS estimations of the effects of aid and RER on exports. In panel 1, RER is not controlled for and the coefficient of aid is significant albeit with the wrong sign. The results imply that with a 1 percent increase in aid inflow,

exports also increase by 34 percent. This is not in line with previous studies and the estimated change is very large. The other variables in the model have their expected signs except the proxy for external demand *OECDgdp*, this variable has a negative sign implying that an increase in external demand decreases exports which logically cannot be correct. The second panel estimates the effect of RER on exports but here aid is not controlled for. The estimation results suggest that a 1 percent increase in the real exchange rate could lead to a decrease in exports by 1 percent. Other variables have their expected signs except *OEDCgdp* again in this model.

The last panel in table 4 has both aid and RER; the estimated coefficients are not very different from those in panels 1 and 2. Here too, the coefficient of the aid variable has a positive sign which as mentioned before is not expected. RER has the expected sign and here again like in the previous models *OECDgdp* has the wrong sign.

With fixed effects, the coefficient of the aid variable acquires the correct sign and both RER and aid are significant in all three models shown in table 5. In the first panel RER is left out of the model. The results imply that on average across the countries in the dataset, a 1 percent increase in aid inflow all else held constant could lead to a 7 percent decrease in exports. Terms of trade estimation in this model is imprecise and imported capital increases exports. Though *OEDCgdp* now has the expected sign, it is not significant in all three models.

In the second panel, aid is left out of the model. Here RER has the expected sign and on average across the 28 countries a 1 percent appreciation in the real exchange rate all else held constant is associated with a decrease in exports by 36 percent. the parameter estimates do not change much in the third panel where both RER and aid are present. The

elasticity of exports with respect to the RER appreciation is quite high in these estimations.

Estimation Results for RER

The estimations for RER in table 6 show results that change dramatically from one estimation method to the next. In the first panel, OLS is used to estimate the effects of the various independent variables on RER. The results suggest that an increase in the in aid inflow by a percent may lead to an increase in exports by 42 percent. This estimate is large and not in line with literature. The other variables except open do not have their expected signs. In the second panel, fixed effects are controlled for. The results do not improve greatly as the aid variable is still of the wrong sign but the size of the estimate decreased. The result implies that on average across the countries in the dataset, a1 percent increase in the foreign aid inflow all else held constant, is associated with a 1.8 percent increase in exports. This estimate is also not in line with previous research. The other variables in the model are either not significant or do not have their expected signs. For example, government expenditure, the productivity measure and change in reserves all have the expected signs but the productivity measure and government expenditure are not significant.

Estimation Results from Path Analysis

The path analysis results in table 7 and 8 show that AID has both a direct effect and an indirect on export performance. While aid has a direct effect on exports with an elasticity of 0.09 percent, the indirect effect through the real exchange rate appreciation

was not estimated precisely in this paper. The results suggest that through the real exchange rate appreciation, aid improves export performance which is not in line with previous findings. RER has only a direct effect on exports with an elasticity of 0.24 percent.

Conclusion and Suggestion for future study

The results for the Effects of Aid on RER in this paper are inconclusive. However Results for Aid and exports are in line with previous literature. Also the path analysis results for the indirect effects of aid on exports through the real exchange rate appreciation are imprecise. This could be because the estimation of the real exchange rate was not correctly done or the model was not specified correctly. The policy implications of the findings in this paper are very important. Policy makers should know that while an appreciation of the real exchange rate could be beneficial to them in the sense that they can import and consume more, it can have negative effects on their exports. They should put in place adequate measures to ensure that receipts of foreign aid are distributed to all sectors of the economy. They should also keep in mind that these receipts are temporary and investing it in sector like the export sector could yield returns which immediate consumption cannot.

In the future, it would be interesting to take into account other forms of aid like tied aid and "aid for trade" and distinguish it from the aid measure used in this paper. Aid for trade is a form of foreign aid where the donor specifically gives aid to be used for trade purposes only. The effects of these various forms of aid on the real exchange rate

and exports could be estimated separately. Also for future studies the real exchange rate

model should be revised to include factors such as interest rates and monetary policy

measures.

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Appendix

Table 1: Countries in Data Set

Countries Included in the data set		
Benin	Guinea*	Niger*
Botswana	Kenya*	Rwanda*
Burkina Faso*	Lesotho	Senegal
Burundi*	Madagascar*	South Africa
Cameroon	Malawi*	Sudan
Cote d'Ivoire	Mali*	Tanzania*
Ethiopia*	Mauritius	Togo*
Gabon	Mozambique*	Uganda*
The Gambia*	Namibia	Zambia
Ghana		

*low income and least developed countries.

Table 2: Variable Description

Variable	Variable Description	Variable Source
Exports/GDP	Export performance measured as exports/GDP. Exports are the non-oil exports from the country in that year.	Export data: WTO GDP data: WDI/GDF
AID	Foreign aid disbursed to the country by the OECD's Development Aid Committee (DAC) as a percent of GDP.	OECD-DAC
RER	Real exchange rate computed by author. Method used: $e.P_h/P_f$ where e is the nominal exchange rate expressed in dollars per home currency. P_h is the CPI in the African country and P_f is the CPI in the US. This measure is the purchasing power in the home country relative to that in the US.	Nominal exchange rate: WDI/GDF CPI : WDI/GDF CPI US: WDI GDF
ImpK	Imported capital. This is the machinery imported by that country in that time as a percentage of GDP	WTO
TOT	Terms of trade. This is the net barter terms of trade. (Export price index/import price index)* 100	World Bank
OPEN	A term that measures the openness of the country to trade. Author computed and is the ratio of [total exports + total imports] to GDP	Imports: WDI/GDF Exports: WDI/GDF
OECDGDP	A measure of foreign demand. This is the aggregate per capita GDP in OECD countries	OECD database
ΔReserves	(Annual change in reserves/GDP)	Change in reserves: WDI
FDI	Foreign direct investment from abroad as a percentage of GDP	WDI/GDF
Prod	Productivity measure. The ratio of local productivity to OECD productivity. Measured as GDP per capita of the African country divided by average aggregate GDP per capita in OECD countries.	GDP per capita: author computed, GDP/POP Population: WDI/GDF
GovExp	Government consumption expenditure as a percent of GDP	WDI/GDF

Table 3: Descriptive Statistics

Variable	N	Mean	SD	Min	Max
ExpGDP	271	17.4086950	15.8937230	0.8881502	84.2826535
AidGDP	280	7.4368178	5.8794344	0.0733359	32.1065787
RER	273	0.0901139	0.2502232	0.000102041	2.2000000
IMPK	269	11.5222228	6.7829038	2.4298645	42.1689692
TOT	280	106.9775236	30.5901562	21.2970385	224.3276477
OECD	280	290.9713990	12.2197971	274.3052000	309.0588200
GOVEXP	260	14.7615385	6.8258014	7.0000000	48.0000000
OPEN	266	69.4774436	29.6526027	28.0000000	188.0000000
PROD	280	3.0772346	4.3452967	0.3591549	16.5970662
RES	269	-2.7983707	6.7724831	-65.7318653	16.3094918
FDI	276	3.0942029	3.0088057	-2.0000000	16.0000000

Table 4: OLS regression results with log (Exports) as dependent variable

Variables	Model 1	Model2	Model3
Log (AID)	0.34532 (0.06854)***		0.36964 (0.06783)***
Log (RER)		-0.10590 (0.04390)**	-0.13192 (0.04191)**
Log (IMPK)	1.22426 (0.18680)***	0.91990 (0.22238)***	0.89746 (0.21095)***
Log (TOT)	-0.36345 (0.28887)	-0.04998 (0.29292)	-0.37133 (0.28400)
Log (OECDgdp)	-0.01478 (0.00874)*	-0.00163 (0.00920)	-0.00848 (0.00882)
Intercept	21.49652 (2.50967)***	19.30048 (2.58763)***	20.96272 (2.47309)
R-square	0.23	0.17	0.26
No of observations	262	262	262

The values in parenthesis are the standard errors. *denotes significance on 10 percent level. ** denotes significance on a 5 percent level. *** denote significance on a 1 percent level.

Table 5: Fixed Effects results with log (Exports) as dependent variable.

Variables	Model 1	Model2	Model3
Log (AID)	-0.07199 (0.03570)**		-0.07146 (0.03499)**
Log (RER)		-0.36016 (0.10640)***	-0.35920 (0.10575)***
Log (IMPK)	0.26025 (0.06570)***	0.19873 (0.06546)**	0.21678 (0.06565)***
Log (TOT)	0.05768 (0.09009)	-0.00538 (0.09026)	0.00241 (0.08979)
Log (OECDgdp)	0.81952 (0.72501)	0.92782 (0.71335)	0.83019 (0.71060)
Log (TIME)	0.07356 (0.01226)***	0.05426 (0.01187)***	0.06241 (0.01246)***
r-square	0.64	0.66	0.66
No of observations	262	262	262

The values in parenthesis are the standard errors. *denotes significance on 10 percent level. ** denotes significance on a 5 percent level. *** denote significance on a 1 percent level.

Table 6: Effects of Aid with RER as dependent Variable

Variables	OLS	Fixed Effects
Log (AID)	0.42036 (0.13188) **	0.017897 (0.0203)
Log (GOVEXP)	1.97034 (0.35639)**	-0.04823 (0.0600
Log (TOT)	0.51037 (0.46697)***	0.196393 (0.0501)***
Log (OPEN)	1.43921 (0.39143)	-0.5204 (0.0663)***
PROD	0.16052 (0.03645)***	-0.07873 (0.0271)**
RES	0.02419 (0.02056)	0.000522 (0.00131)
FDI	0.12062 (0.05108)**	0.00159 (0.00448)
Intercept	-21.36714 (2.92252)***	N/A
R-square	0.27	0.98
No of observations	241	241

The values in parenthesis are the standard errors. *denotes significance on 10 percent level. ** denotes significance on a 5 percent level. *** denote significance on a 1 percent level.

Path Analysis for Direct and Indirect Effects

Table 7: Maximum Likelihood Estimation Standardized results, effects on Exports/GDP

Path	Estimates
EXPORTS ⇐ AID	-0.9030 (0.05096)*
EXPORTS ⇐ RER	-0.24124 (0.05271)***
RER ⇐ AID	-0.04886 (0.05668)
RER ⇐ OPEN	0.28902 (0.04869)***
AIC	45.81
Adjusted GFI	0.58
Chi Square	17.81

The values in parenthesis are the standard errors. *denotes significance on 10 percent level. ** denotes significance on a 5 percent level. *** denote significance on a 1 percent level.

Table 8: Maximum Likelihood estimation: Standardized results for path list

Path	Total Effects	Direct Effects	Indirect Effects
EXPORTS ⇐ AID	-0.0785 (0.0541)	-0.0903 (0.0510)*	0.0118 (0.0139)
EXPORTS ⇐ RER	-0.2412 (0.0527)***	-0.2412 (0.0527)***	0

The values in parenthesis are the standard errors. *denotes significance on 10 percent level. ** denotes significance on a 5 percent level. *** denote significance on a 1 percent level.

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