

Empirical Analysis – The Extended Gravity Models

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln DIS_{ij} + \varepsilon_{ij} \quad (1)$$

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln DIS_{ij} + \beta_4 \ln POP_i + \beta_5 \ln POP_j + \varepsilon_{ij} \quad (2)$$

In order to find out the trade creation and diversion of AANZFTA, the Gravity model in equation (2) is further modified by including 3 dummy variables denoting the regional effect of AANZFTA's export and import creation or diversion, and trade creation or diversion, respectively. The 3 dummy variable will be added one by one to verify the robustness of variable. The other 3 equations are specified as:

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln DIS_{ij} + \beta_4 \ln POP_i + \beta_5 \ln POP_j + \alpha_1 exAANZFTA_{ij} + \varepsilon_{ij} \quad (3)$$

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln DIS_{ij} + \beta_4 \ln POP_i + \beta_5 \ln POP_j + \alpha_1 exAANZFTA_{ij} + \alpha_2 imAANZFTA_{ij} + \varepsilon_{ij} \quad (4)$$

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln DIS_{ij} + \beta_4 \ln POP_i + \beta_5 \ln POP_j + \alpha_1 exAANZFTA_{ij} + \alpha_2 imAANZFTA_{ij} + \alpha_3 AANZFTA_{ij} + \varepsilon_{ij} \quad (5)$$

Source: Laopoonpittaya (2016), A Gravity Model For Trade Creation and Trade Diversion

Denotation of Variables

Dependent Variable	X_{ij}	The value of export from country i to j in US\$
Core Independent Variable	GDP_i, GDP_j	Nominal value of gross domestic product of country i and j in current US\$
	DIS_{ij}	Distance between the capital city of country i and j in kilometers
Additional Independent Variable	POP_i, POP_j	Population of country i and j
Additional Independent Variable (Dummy Variable)	$exAANZFTA_{ij}$	The dummy variable to capture the effect of export creation or diversion (=1 if only export country i is a member of AANZFTA, = 0 otherwise)
	$imAANZFTA_{ij}$	The dummy variable to capture the effect of import creation or diversion (=1 if only import country j is a member of AANZFTA, = 0 otherwise)
	$AANZFTA_{ij}$	The dummy variable to capture the effect of export creation or diversion (=1 if both countries i and j are members of AANZFTA, = 0 otherwise)
	ε_{ij}	Natural log of normal-distributed error term

Possible outcomes of effects of trade integration in FTA

	Export Effect		Import Effect	
	$\alpha_1 > 0$	$\alpha_1 < 0$	$\alpha_2 > 0$	$\alpha_2 < 0$
$\alpha_3 > 0$	Pure trade creation in term of Export	- Trade creation and Export diversion $\alpha_3 > \alpha_1$ - Export diversion $\alpha_3 < \alpha_1$	Pure trade creation in term of import	- Trade creation and Import diversion $\alpha_3 > \alpha_2$ - Import diversion $\alpha_3 < \alpha_2$
$\alpha_3 < 0$	Expansion of extra-bloc exports	Export diversion and Contraction of intra-bloc export	Expansion of extra-bloc imports	Import diversion and Contraction of intra-bloc imports

Source: Laopoonpittaya (2016), A Gravity Model For Trade Creation and Trade Diversion

Source : Yang and Martinez-Zarzoso (2013)

	OLS1	OLS2	OLS3	OLS4	OLS5
$\ln GDP_{it}$	1.122*** (-48.62)	1.325*** (-45.46)	1.325*** (-45.22)	1.348*** (-44.3)	1.350*** (-44.18)
$\ln GDP_j$	0.988*** (-53.62)	1.137*** (-46.03)	1.141*** (-44.78)	1.140*** (-44.29)	1.140*** (-44.29)
$\ln DIS_{ij}$	-1.281*** (-31.64)	-1.445*** (-34.39)	-1.445*** (-34.32)	-1.443*** (-33.98)	-1.457*** (-33.64)
$\ln POP_{it}$		-0.332*** (-14.23)	-0.333*** (-14.30)	-0.335*** (-14.48)	-0.345*** (-14.90)
$\ln POP_j$		-0.236*** (-9.10)	-0.236*** (-9.11)	-0.242*** (-9.41)	-0.252*** (-9.72)
$exAANZFTA_{ij}$			-0.082 (-0.89)	-0.124 (-1.35)	-0.188* (-2.00)
$imAANZFTA_{ij}$				-0.475*** (-5.74)	-0.541*** (-6.38)
$AANZFTA_{ij}$					-0.304** (-3.27)
R-squared	0.7562	0.7792	0.7793	0.7817	0.7830
P-value of F-test	0.0000	0.0000	0.0000	0.0000	0.0000
No. of Observation	2081	2081	2081	2081	2081

Source: Laopoonpittaya (2016), A Gravity Model For Trade Creation and Trade Diversion