Analysis of the Determinants of International Trade: An Australian Perspective

Xinyue Zhou[1,*]

[1] *Australian National University*
[*] *Corresponding author. Email: u6104297@anu.edu.au*

ABSTRACT
Taking Australia from 2010 to 2019 as an example, this paper investigates various determinants of international trade by analyzing their impacts on exports and imports. This study uses the annual trade data of 11 principal trading partners in Australia (accounting for approximately 70% of Australia's international trade), and the result is fourfold. This shows that the economic quality has a positive impact, which is consistent with the hypothesis of gravity model. Geographic distance is positively correlated with total trade, which is mainly due to the consideration of other factors, especially the trade policy. Trade costs at home and abroad have had a statistically significant negative effect on Australian international trade. Australia's trade policy, especially the proliferation of free trade agreements, has greatly fostered exports and imports of Australia.

Keywords*: Australia, International Trade, Free trade agreement, Gravity model*

1. INTRODUCTION

From 2010 to 2019, the economic growth of Australia was volatile. It accelerated from 2010 to 2013 and plunged in the following three years, hitting its lowest ebb in 2016. By substantially expanding the scale of exports, the economy was able to recover. According to the Australian Bureau of Statistics database, Australia's GDP growth remained stable, reaching 2.2% in 2019.

Throughout the decade, international trade has become critically significant to the Australian economy, accounting for 45.71% of Australian GDP in 2019. During 2010 to 2019, Australia's exports have increased from $227.417 billion to US $336.431 billion, an increase of 47.94%, and its imports have increased from $238.004 to $301.71 billion, an increase of 26.77%. In the selected decade, both exports and imports of Australia have fluctuated significantly, as has its GDP In 2019, China ($102.99B), Japan ($39.45B), South Korea ($17.46B), the United States ($10.17B), and the United Kingdom ($10.57B) were Australia's five major export markets of Australia, while China ($56.95B), the United States ($26.23B), Japan ($15.47B), Thailand($10.67B) and Germany ($10.52B) were top 5 import sources of Australia. Among them, Australia's largest trading partner is China. Both the import and export volume of Australia to China ranked first in the composition of Australian international trade.

To better understand the framework of Australia's international trade and promote Australia's economic development in the next decade, this paper looks into the main factors, including GDP, population and distance from the gravity model, as well as other prominent elements such as the impact of trade cost and trade policies on trade between Australia and its main trade partners. The paper consists of four parts. First, this paper reviews the extant literature on the determinants of international trade; Second, for the data method, gravity model and OLG method are used for analysis; Third, this paper presents the data summary and detailed discussions, and summarizes the limitations of this paper and its enlightenment to the future research.

2. LITERATURE REVIEW

Since the gravity model [2] [3] was introduced to analyze international trade, there has been considerable research in this field. Freund and Weinhold [4] demonstrated the positive correlation between the economic volume and the amount of international trade in goods. Grunfeld and Moxnes [1] used gravity model to test the factors of bilateral service output. They confirmed that the service trade between the two countries is also positively correlated with the size of GDP.

Leamer and levinsohn [9] found that there is a

Copyright © 2022 The Authors. Published by Atlantis Press International B.V.
This is an open access article distributed under the CC BY-NC 4.0 license -http://creativecommons.org/licenses/by-nc/4.0/.

negative correlation between bilateral trade and geographical distance. In the case of goods trade, this distance is more significant than goods classification. The longer the distance, the higher the transaction cost of bilateral trade, especially trade in services [8]. However, some studies found that for trade in services, distance may not be as important as trade in goods [6] [7] or even not [11], which is inconsistent with the gravity model.

Trade barriers also play a vital role in international trade. Lee and Swagel [8] pointed out that trade barriers and tariffs may have a negative impact on trade. Scholars have found that both tariffs and non-tariff measures have the equivalent and significant negative influences on imports [9]. Others have proved that tariffs are more crucial to trade in manufactured goods than non-tariff barriers.

In terms of the impact of trade policy, free trade agreement (FTA) is the first choice. The study found that a positive effect of an East Asia FTA on the GDP of member countries [12]. However, through the implementation of FTA, trade creation and trade diversion effects are constrained. Both Australia and China may benefit from the creation of FTA [13], other parts of the world may suffer due to the lack of trade creation and diversion effects. Moreover, common language, common border, and colonization influence international trade.

3. DATA METHODOLOGY

According to Bergstrand [2], the traditional gravity model is used to test the impact of different factors on exports and imports in Australia. The dependent variables in this study are i) Australian exports and ii) Australian imports in a given year (t). The explanatory variables contain i) GDP per capita of trade partners, which indicates a country's economy; ii) Geographic distance between Australia and trade partners; iii) General trading cost between Australia and trade partners; iv) Free Trade Agreements indicating the trade policy between Australia and other countries; v) Common language [10]. More information about the data is described in Table 2.

The hypotheses are as follows:

H1: The GDP per capita of both Australia and 11 trade partners positively affects both Australian exports and imports.

H2: Geographic distance between Australia and its trade partners negatively affects both Australian exports and imports.

H3: Trade costs have adverse effects on both Australian exports and imports.

H4: Having free trade agreements positively affects both Australian exports and imports.

H5: Having a common language positively affects both Australian exports and imports.

The estimated equation is

$$\ln Y_{ij,t} = \alpha_0 + \alpha_1 \ln\_pGDP_{ij,t} + \alpha_2 \ln\_dis_{ij,t} + \alpha_3 \ln\_cost_{ij,t} + \alpha_4 FTA_{ij,t} + \alpha_5 CL_{ij,t} + \varepsilon$$

The dataset is selected from 2010 to 2019. The sample includes 11 countries and Australia: China, Germany, Indonesia, Japan, Korea, Malaysia, New Zealand, Singapore, Thailand, the United Kingdom, and the United States. In 2019, these countries accounted for nearly 70% of Australia's international trade, imports, and exports. Specifically, Australia's exports and imports in thousands are from the Australian Bureau of Statistics. GDP (billion dollars) and population (millions) are retrieved from World Bank data. Geographic distance (in kilometers) and common language (a dummy variable) are obtained from the CEPII Geodist database. FTA is a dummy variable obtained from the Department of Foreign Affairs and Trade on the Australian government website. All dummy variables equal to 0 represent non-common language/non-free trade agreements, and equal to 1 represents common language/free trade agreements.

4. RESULTS AND DISCUSSIONS

Multilinearity is checked using the VIF test. All VIF results are below 2.5, which indicates the possibility of multicollinearity is low. The equation is estimated by ordinary least square regression (OLS) of Australia and its 11 importing and exporting countries. The data results are shown in Table 1.

Table 1 data summary

	(1)	(2)
VARIABLES	lnim	lnex
lnpergdp_aus	0.751*	0.582
	(0.405)	(0.831)
lnpergdp_j	0.306***	0.236*
	(0.0508)	(0.122)
ldis	1.028***	0.869***
	(0.0854)	(0.179)
lncost	-0.925***	-1.254***
	(0.200)	(0.318)
FTA	1.419***	2.095***
	(0.0842)	(0.265)
CL	-0.588***	-0.274
	(0.0753)	(0.226)
Constant	6.182***	9.009**
	(1.754)	(3.734)
Observations	110	110
R-squared	0.576	0.350

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 1 shows that in terms of both Australian exports and imports from 2010 to 2019, the GDP coefficients of importers, and are statistically significant at 10% and 1% respectively, indicating that the economic performance of Australia's trading partners has a positive effect on both Australia's imports and exports. Besides, the GDP of Australia has a positive impact on imports, and a negative impact on exports, but the coefficients are not significant. From the collinearity VIF test and correlation matrix, the factor GDP is highly correlated with the population, which may cause the collinearity problem in the regression model. To illustrate the effect of population, the combination of GDP and population is added: per capita GDP.

As for distance, Australia's exports and imports are positively correlated with distance variables, which is inconsistent with the general findings on the relationship between geographic distance and international trade.

One of the significant factors on exports and imports is trading cost. Table 1 shows that there is a negative relationship between trade cost and international trade, which is significant at 1%. Moreover, for Australia's imports, the effect of trade cost is greater than that of Australian exports.

The effect of FTA has a significant influence on Australia's international trade. Signing a Free Trade Agreement means eliminating various barriers, facilitating the whole international trade. Since the last century, Australia has signed FTAs in force with countries that later became its main trading partners, including China, New Zealand, the United States, Thailand, Malaysia, Japan, and so on.

The common language also plays a role in international trade. Helliwell [5] found that general common language positively impacts on both exports and imports. However, this effect is mainly driven by the role of English, while the effects of other languages such as Spanish, French, and German were statistically insignificant. The results show that from the perspective of Australians, the common language actually has a negative influence, which is significant at 10% on average. Among them, major trading partners like China, Japan, Thailand, and Germany do not share a common language with Australia, indicating that language is not a principal criterion for Australia to select trading partners.

5. CONCLUSION

This paper focuses on the determinants of international trade in Australia. The gravity model is employed as the baseline model in this study. The results show that from the perspective of Australia, the impacts of general determinants of previous empirical analysis may differ. The per capita GDP of trading partners has a significantly positive effect on Australian imports and exports. Geographic distance, however, is positively related to Australia's international trade, partly due to the unique geographic location of Australia. Trade costs are negatively correlated with international trade, which is consistent with previous studies. The Free Trade Agreement represents an encouraging trade policy and fosters Australia's imports and exports. Furthermore, the common language is not an essential factor in Australia's choice of trading partners. For future studies, other factors may be considered to enrich the study such as the country's degree of technological and human development.

APPENDIX

Table 2 variable description

Variable	Description	Data source
EX	Australian exports of goods and services (USD million)	Australian Bureau of Statistics
IM	Australian imports of goods and services (USD million)	Australian Bureau of Statistics
GDP	Gross domestic product in current price (USD in million)	World Bank's World Development Indicators (WDI)
POP	Population (million)	World Bank's World Development Indicators (WDI)

DIST	Bilateral distance	CEPII GeoDist database
COST	Trading costs	The World Development Indicators
FTA (dummy)	Free Trade Agreement	Australian Government Department of Foreign Affairs and Trade
CL (dummy)	Common language	CEPII GeoDist database

REFERENCES

[1] Grünfeld, L. A., & Moxnes, A. (2003). The intangible globalization: Explaining the patterns of international trade in services. NUPI Working Paper, 657.

[2] Bergstrand, J. H. (1985). The gravity equation in international trade: some microeconomic foundations and empirical evidence. The review of economics and statistics, 474-481.

[3] Bergstrand, J. H. (1989). The generalized gravity equation, monopolistic competition, and the factor-proportions theory in international trade. The review of economics and statistics, 143-153.

[4] Freund, C., & Weinhold, D. (2002). The Internet and international trade in services. American Economic Review, 92(2), 236-240.

[5] Helliwell, J. F. (1997). National borders, trade and migration. Pacific Economic Review, 2(3), 165-185.

[6] Leamer, E. E., & Levinsohn, J. (1995). International trade theory: the evidence. Handbook of international economics, 3, 1339-1394.

[7] Lejour, A., & de Paiva Verheijden, J. W. (2007). The tradability of services within Canada and the European Union. The Service Industries Journal, 27(4), 389-409.

[8] Lee, J. W., & Swagel, P. (1997). Trade barriers and trade flows across countries and industries. Review of economics and statistics, 79(3), 372-382.

[9] Leamer, E. E. (1990). Latin America as a target of trade barriers erected by the major developed countries in 1983. Journal of Development Economics, 32(2), 337-368.

[10] Kimura, F., & Lee, H. H. (2006). The gravity equation in international trade in services. Review of world economics, 142(1), 92-121.

[11] Walsh, K. (2006). Trade in services: does gravity hold? A gravity model approach to estimating barriers to services trade.

[12] Urata, S., & Kiyota, K. (2003). The impacts of an East Asia FTA on foreign trade in East Asia.

[13] Qi, C., & Zhang, J. X. (2018). The economic impacts of the China-Australia Free Trade Agreement-A general equilibrium analysis. China Economic Review, 47, 1-11.