Australian and New Zealand response to aid and trade: regional impact results

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Abstract
To facilitate trade in developing countries a response to calls for targeted assistance became an established norm to assist in removing of trade constraints and promote economic growth. Aid and trade and aid for trade terms became crucial as many of the academics, donors, multilateral organisations amongst others have avidly noted that years of growth and development are yet to reduce poverty and countries to benefit from trade. Having classified the various components of aid and then aid for trade the key measurement variables highlight what then should we measure? Giving aid to assist in the development of recipient countries is also seen to promote donors' commercial interests. This study, in evaluating the effectiveness of Australian and New Zealand aid and trade to the Asia-Pacific nations, examines the link between aid and trade expansion using the gravity model. The model estimations for the Australian and New Zealand aid and trade nexus highlight the significance of aid for trade. These linkages reflect the policy implications for the aid donors and aid recipients, and the effectiveness of aid for trade.

Introduction
Trade has been a crucial factor for growth and almost all developing nations depend significantly on imports to meet its resource needs and to export. As these nations comprise mainly of primary products diversification of export commodities and reduction in cost have been the main focus of trade strategies. Aid has been substantially utilised to enhance trade infrastructure since 1980s. Recent focus on aid for trade (AfT) in building the supply-side capacity and trade related infrastructure became a crucial focus of foreign aid and its effectiveness. The Asia-Pacific countries being dependant on trade of goods and services have several trading agreements to improve their trading performance and gain external markets. Exports from Asia comprise of agricultural, manufacturing and services while the small Pacific islands exports mainly include a narrow range of primary commodities. The island nations also generally have a high degree of openness to international trade and therefore any change in the terms of trade will lead to significant change in their export earnings and growth (Broda and Tille, 2003).

To facilitate trade in developing countries donors have targeted assistance to assist in removing of trade constraints and promote economic growth. Aid and trade and aid for trade terms became crucial as many academics, donors, multilateral organisations amongst others have avidly noted that years of growth and development are yet to reduce poverty and countries to benefit from trade. Having classified the various components of aid and then aid for trade the key measurement variables highlight that effectiveness of aid in developing countries and in particular for small and vulnerable economies depend on the type, focus and sector of aid programmes and whether aid for trade remove the binding constraints (Cali, Rassaque and te Velde, 2011, Asian Development (ADB)/World Trade Organization (WTO), 2011).

Foreign aid to developing countries over the last five decades saw many changes to address the economic-social development of these recipients. Giving aid to assist in the development of recipient countries is also seen to promote the commercial interests of the donor (Gounder, 1994, 1995). This study, in evaluating the effectiveness of the Australian and New Zealand aid and trade to the Asia-Pacific nations, examines the link between aid and trade expansion using the gravity model.

For their long term development strategy, many of the developing countries have diversified its output and export focus in favour of commodities and economic activities with a more advantageous production and demand characteristics. Stiglitz and Charlton (2006, 2013) note the right to trade and the right to development by rethinking the aid for trade agenda as trade has been a significant part of nations'

economic activities. The complex combinations of trade issues that nations face relate to gains from trade, thus, a vital measure in selecting a trade approach is its impact on economic growth. The trade literature points to import substitution policies, protectionism, balanced growth and industrialisation policies in the 1950s and 1960s. This caused poor export capability and consequently a failure to stimulate and develop domestic-driven growth.

In the late 1980's and 1990's many developing nations focused on outward-looking export oriented growth policies as a measure to stimulate economic growth, promote international and domestic equality, reward sectors of comparative advantage, and for better prices and reduced cost of production. Although many developing nations have opened the economies to trade there has been a failure to capture the markets, existence of tariff and quotas, etc. The flailing Doha Round saw to the aid for trade initiative come into existence in 2005. Under the discourse of WTO's trade policy, the aid for trade categorisation includes projects and programmes activities for trade-related priorities of development strategies (Organization for Economic Co-operation and Development (OECD), 2006; OECD/WTO, 2007).

Addressing development concerns and an effective implementation of the initiatives in developing countries rely heavily on the changes in the aid policy where the cooperation of donors, public and private sectors can link aid and trade to benefit the developing countries. Measuring the aid-trade nexus show the trade practices of the donors. Question that arises is does procurement from a country amount to donor's aid related to those projects or exports beyond aid. The estimation of Australian and New Zealand aid and trade linkages highlight the significance of aid and trade to Asia-Pacific region. The paper is organised as follows: the penultimate section examines the trade and aid literature followed by the models, data and empirical results, and the conclusion.

Aid and Trade: A Brief Overview

The key questions on aid and trade issues that nations face are how does aid facilitate trade development and increase economic growth; how trade affect economic growth and income distribution; does trade promote the achievement of development objectives; and should they pursue outward or inward oriented trade policies, or some combination of the two. The answers will not be the same for all countries given the great diversity that exist amongst developing countries in regard to the role of international trade in promoting economic development.

Developing countries could not rely just on North-South trade nexus given the high unequal trade in favour of developed nations, the unequal distribution of resource endowments between countries, particularly with respect to skilled and unskilled labour. Many developing countries' trade has not stimulated the associated benefits, while economies of China, India, South Korea and Taiwan have benefited from trade. But clearly the issue is not whether to trade but which export products to promote, gaining the markets, building the trade capacity and address the nature of export sector and its medium to long term potential.

With this follows the distribution of benefits, its linkages with the rest of the economy, and the country's ability to respond smoothly to changing international price signals. However, there are many nations that require assistance to identify the trade rules, services, activities and facilities with either the group of North countries as well as South countries. The AfT was created in response to the crisis confronting the multilateral trading system in the 2000s (Stiglitz and Charlton, 2013). It has the focus to support in building the supply-side capacity, assist the developing countries arrange with trade related adjustments, and develop trade preferential mechanisms (i.e. multilateral trade liberalisation processes).

Trade Sector: Export Competitiveness and Trade Diversification

The Asia-Pacific countries have been engaged in the international trade of goods and services since the early nineteenth century; however, the trade in volume of goods and services has increased substantially since their independence. Trade liberalization programme became vital after independence era of these nations' as purchases from abroad grew dramatically with merchandise exports growth. While total exports increased over time imports rose by almost double the amount of exports on average.

The concern for developing nations is their participation in the global market due to lack of competitiveness. The key inputs to improve export competitiveness is determined by three main factors: *i)* domestic productivity, which determines the costs of production; *ii)* trade costs, which determine the cost

of exporting the good or service and, *iii)* the effective level of market access which determines the extent of unilateral, regional or multilateral trade reforms and the capacity to meet standards and overcome information gaps on export markets (OECD, 2006, p.28).

The key input that nations require include economic and regulatory frameworks such as general (energy) and productive infrastructure (banking and financial services, agriculture, mining, manufacturing), research and development; trade related infrastructure (transport, storage) trade facilitation; trade policy and regulations (regional and multilateral negotiations, standards, etc.), trade development (trade promotion strategy, market analysis). Aid for trade is responsible in assisting developing countries capture export gains and benefits from trade.

Measuring competitiveness shows the position to generate and capture development gains from international trade and trade negotiations through participation in the world trade. According to World Investment Report 2002, greater competitiveness allows developing countries to diversify away from dependence on a few primary based commodity exports and ascend the skills and technology pyramid, essential to sustain the rising wages. It also allows the realization of greater economies of scale and prospect by offering larger and more diversified markets by improving exports, better quality of production, upgrading technology and skills and expands domestic firms to compete regionally and globally (UNCTAD, 2002).

The developing countries in the past have made some progress in liberalizing their trade policies by removing quantitative import restrictions, reducing tariffs, resorting to anti-dumping actions and imposing anti-dumping duties on top of normal tariff. However, such reforms may take long and could be challenging (OECD, 2010; World Bank, 2006). Thus, many nations have adopted export promotion policies as a measure to reduce anti-export bias and make their exports more competitive. Piezas-Jerbi and Nee (2009) state that when a shift share is applied to international trade, a country's export competitiveness does not change and all other factors influencing its exports are held constant; as a result, a country's share in world trade should remain constant over time as well. Two aspects have been crucial; first, nations have emphasized the need to enhance competitiveness of its products in the international markets (WTO, 2009). Second, the potential of private sector operating in the open markets that could bring greater revenue and employment, thus need for export diversification, i.e. growth of non-traditional exports and manufacturing sectors for export development.

Large trade deficits have undermined export potential and competitiveness in the world market. For export markets to achieve the economies of scale or specialization capable to generate higher living standards export competitiveness is an essential requirement for the economy's long-term success. While export promotion and development has been the central objective of several government policies since the late 1980s, yet some of the low-income Asia-Pacific nations did not have a considerable measure of success as reflected in their ratio of exports of goods and services to GDP share as it slightly declined over time, particularly in the post-2008 crisis (World Bank, 2011).

The world trade recorded its largest ever annual increase in 2010, as merchandise exports surged by 14.5% buoyed by a 3.6% recovery in the global output. The significant rise has been in both trade and output which grew faster in developing economies than developed nations. Exports in real terms increased by nearly 17% in developing nations and 13% in developed economies in 2010 (WTO, 2011). The difference in imports has been higher for these two groups, i.e. developed economies' imports rose by 11% compared to 18% for the rest of the world for the same year (ibid). Addressing some of the challenges to enhance export competitiveness and take advantage of trade opportunities will depend on trade policies and aid programmes crucial for growth and development of export sectors. Export performances are usually considered as the sum of their competitive positions as it helps stimulate greater foreign exchange as well as improves their balance of payments.

Diversification of export commodities and gaining external markets through bilateral and multilateral trade agreements and trade liberalisation policies play a major role in enhancing economic growth. For most Asia-Pacific countries export diversification remains a considerable challenge. Diversification index shows whether the structure of exports or imports by product of a country or group of countries differ from the structure of product of the world (UNCTAD, 2011). It ranges from 0 to 1, shows the extent of differences between trade structure of a country or country group and the world average.

Recent economic literature provides evidence that economic growth and development is better promoted via diversification of production (see Elek, Hill and Tabor, 1993; Imbs and Wacziarg, 2003; Prasad and Tisdell, 2006; Sultan, 2008). Many developing countries have pursued export diversification as a deliberate growth strategy to insulate themselves from the sharp and unexpected changes in their terms of trade and by extension to stabilize domestic incomes and employment (Yari, 2002).

Table 1 Export Diversification Index, Selected South East Asia-Pacific Countries, 2000-2012

Diversification Index	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cambodia	0.832	0.836	0.840	0.851	0.840	0.829	0.830	0.830	0.825	0.843	0.844	0.796	0.789
Indonesia	0.487	0.507	0.506	0.503	0.501	0.493	0.493	0.512	0.507	0.520	0.552	0.558	0.555
Laos PDR	0.743	0.784	0.770	0.754	0.809	0.767	0.780	0.785	0.785	0.784	0.779	0.790	0.766
Malaysia	0.506	0.501	0.509	0.499	0.474	0.467	0.453	0.439	0.469	0.469	0.469	0.468	0.455
Philippines	0.652	0.623	0.626	0.625	0.622	0.620	0.615	0.613	0.613	0.601	0.602	0.596	0.566
Thailand	0.403	0.399	0.393	0.388	0.388	0.389	0.392	0.394	0.410	0.388	0.388	0.398	0.401
Vietnam	0.569	0.644	0.665	0.658	0.656	0.638	0.620	0.599	0.576	0.579	0.567	0.554	0.520
Fiji	0.782	0.766	0.733	0.734	0.767	0.757	0.733	0.719	0.734	0.721	0.721	0.734	0.727
Papua New Guinea	0.841	0.835	0.844	0.841	0.825	0.817	0.829	0.825	0.808	0.824	0.815	0.558	0.555
Samoa	0.695	0.795	0.714	0.695	0.732	0.707	0.699	0.739	0.688	0.646	0.656	0.668	0.718
Solomon Islands	0.795	0.790	0.831	0.781	0.782	0.823	0.799	0.814	0.765	0.762	0.790	0.777	0.824
Tonga	0.669	0.715	0.643	0.648	0.663	0.673	0.648	0.659	0.683	0.653	0.659	0.683	0.722
Vanuatu	0.782	0.714	0.725	0.741	0.757	0.781	0.810	0.810	0.842	0.829	0.822	0.558	0.555

Source: UNCTAD (2011).
Note: 1 = concentrated on one product, 0 = very diversify

Many Asian nations have diversified their exports except for Cambodia and the Philippines during 2000-2012 period (Table 1). Export strategies in many countries have certain priority sectors (agri-business, manufacturing, forestry, marine products, ICT and other services) to improve the export performance. Yari (2002) points out that a recent WTO study notes that overall developing countries have reduced their reliance on agricultural export commodities and have made remarkable progress in exporting manufactured goods over the past three decades. For this to encourage export growth and development consistent government policies and a level playing field for all entrepreneurs and trading partners are important.

Many Pacific countries' export diversification index range above 0.6; they export a narrow range of primary products. There are many constraints that Pacific nations face in seeking to diversify their export base, these include geographical isolation, lack of skilled manpower, inadequate infrastructure, conflict over domestic resources, high transportation costs (Gounder, 2003; Yari, 2002). Also, prices of various export commodities have fluctuated widely over time (Rajapatirana, 2000; Yari, 2002). Although the Pacific nations made progress in liberalizing the economy they continue to largely rely on primary products for most of its export earnings. Diversifying of the export base has not been successful for these small island nations, thus implementing national export strategy will be vital to boost exports and diversify the markets as well.

Bilateral Aid and Focus: Australia and New Zealand

Australia and New Zealand's long association with the Asia-Pacific region can be traced back to over a century while the past five-six decades saw to a substantial flow of foreign aid, trade foreign direct investment and remittances between the countries in this region. Under the Commonwealth Colombo Plan their aid flows started in 1950 while trade linkages from the British colonization period were underway with Asia-Pacific nations. Aid under the Colombo Plan included a diverse range of activities, e.g. education, technical co-operation, training, staffing assistance, etc. Both donors joined the Development Assistance Committee (DAC) of the OECD in 1966 as their memberships of international and regional bodies (World Bank, United Nations Development Programme, ADB, other UN organisations) saw to a wider focus. Since those early times, Australia and New Zealand aid allocations have expanded.

With the changing international development issues Australia's new aid policy (An effective aid program for Australia: Making a real difference – delivering real results) specify the key purposes as helping people overcome poverty, saving lives, promoting opportunities for all, sustainable economic development, effective governance and humanitarian and disaster response in the region and beyond (Commonwealth Government, 2012, p.10). New Zealand's aid policy is to support sustainable development in developing countries in order to reduce poverty and to contribute to a more secure, equitable and prosperous world (Ministry of Foreign Affairs and Trade, 2011, p.2). These aid policies reflect significant changes in the economic, social and humanitarian responses to improve developing nations' socio-economic performance and wellbeing.

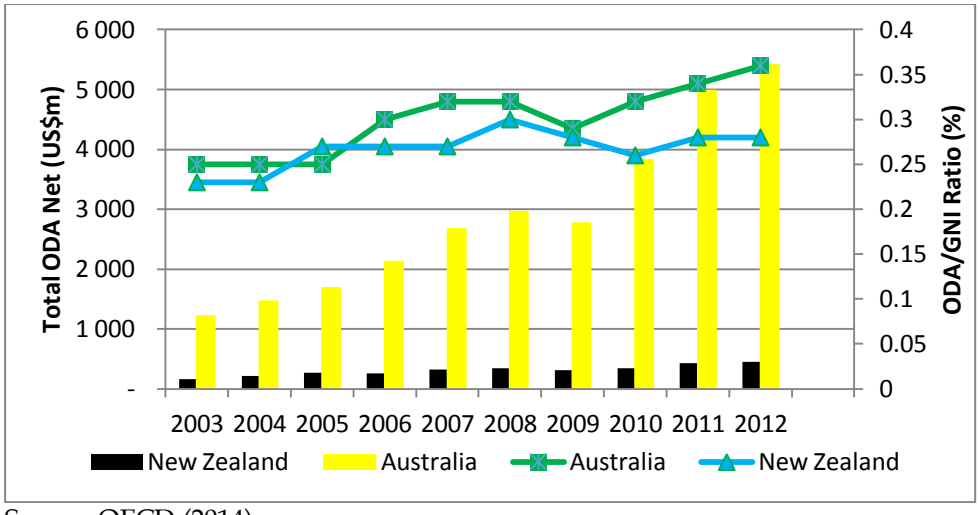
Statements from donors also indicate multiple aid objectives. Poverty alleviation forms the most important objective of aid. However a balance of motivations between the recipient countries needs and donor countries interests have become an underlying principle of aid allocation. Generally, high-income donors give aid to some countries and not to others. Moreover, these patterns change over time. Decisions on aid levels depend on complex assessment of various government objectives and the political determination of total volume of aid. With most donors combination of altruistic and self-interest motives, aid allocations reflect a regional, sectoral, strategic and commercial interests.

The Australian and New Zealand bilateral aid makes up over three-quarters of its total aid budget which are dominated by "country programs", and the rest in multilateral form also has a regional focus for specific development purposes in the Asia-Pacific region. These two donors have economic, political and cultural linkages with nations in the Asia-Pacific region and provide aid in various forms and a high proportion of aid to Oceania and the South East Asian countries. The aid distribution reflects its particular regional needs and to a large extent their geographic locations dictate the shape of its development assistance programs. Australia's net official development assistance (ODA) increased from US$1,219 million in 2003 to US$5,403 million in 2012 (varying from 0.23% (2003) to 0.28% (2012) of ODA to Gross National Income (GNI) share (Fig 1). New Zealand's ODA increased from US$165 million in 2003 to US$449 million in 2012, its ODA/GNI share range between 0.23% and 0.28% for the period 2003 to 2012.

The tying of aid forms a major factor of donor interest. In 2001, the DAC's recommendation for untied aid to the Least Developed Countries saw Australia and other OECD members meeting this requirement of untied aid (other members include Finland, France, Germany, Ireland, Japan, the Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom, OECD, 2010). The Paris Declaration on Aid Effectiveness notes that untying of bilateral aid is vital to reduce cost distortions and making aid effective (OECD, 2010). New Zealand has a share of untied aid at 83% and all of Australia's aid is fully untied in 2011 (OECD, 2013).

The Commitment to Development Index, measures the "development friendliness" of rich countries, penalizes donor governments for tied aid in this index. Tied aid has the tendency of making donors to focus more on the commercial advancement of their countries. Thus, the idea of maximizing development should be separated from the notion of pursuing commercial interest. Tied aid improves donors export performance, creates business for local companies and jobs and expose firms which have not had any international experience on the global market to do so. Australia and New Zealand have been the major donors in the Asia-Pacific region and the trade linkages extended with Asian countries also form the top 10 trading partners for both these countries.

Fig 1 Total ODA and ODA/GNI Ratio, 2003-2012



Source: OECD (2014).

Aid and Trade Models Specifications, Methodology and Results

The gravity model specifications indicate the impact of aid and trade based on the donor and recipient factors utilising the independent variables that affect the decision(s) of the donors' aid-trade relationships. Following the study by Wagner (2003) that used gravity model to analyse the aid and trade linkages for DAC members, this study examines the links between Australian and New Zealand aid and exports of goods given their regional interest in the South East Asia (SEA) and South Pacific (SP) region that include 13 developing countries (Colombia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam, Fiji, Samoa, Papua New Guinea, Solomon Islands, Tonga, Vanuatu). The estimation period is 2002 to 2011.

To assess the linkages of aid and trade the two dependent variables are (a) total aid flows (Net ODA) from Australia and New Zealand to countries in South East Asia and the South Pacific (13 countries, based on data availability), and (b) exports from Australia and New Zealand to countries in SEA and the SP. Given their geographical proximity and close relationship of the two donors the pattern of aid can be said to follow close commitments in this region.

Aid and Trade Specification

In considering the impact of exports (trade) gravity model equation (1) is presented for the exports from the donor country (*i*) to recipient country (*j*). Similar to the traditional gravity models the trade linkages and the effects of aid and trade are estimated using the donor (*i*) and recipient countries factors (*j*). Equations (1 and 2), expressed as natural logs, take the following specifications for trade (i.e., exports) and aid framework:

$$\ln(T_{ij}) = \beta_0 + \beta_1 \ln(GDP_{ij}/GDP_w) + \beta_2 \ln(GDPpc_i) + \beta_3 \ln(GDPpc_j) + \beta_4 \ln(Dist_{ij}) + \beta_5 Rem_i + \beta_6 Rem_j + \beta_7 Lang_{ij} + \varepsilon_{1ij} \quad (1)$$

$$\ln(A_{ij}) = \beta_0 + \beta_1 \ln(GDPpc_i) + \beta_2 \ln(GDPpc_j) + \beta_3 \ln(Dist_{ij}) + \beta_4 Rem_i + \beta_5 Rem_j + \beta_6 Lang_{ij} + \varepsilon_{3ij} \quad (2)$$

where: T*ij* is the exports between donor *i* to recipient country *j*;

A*ij* is total net ODA from donor *i* to recipient country *j*;

GDP is Gross Domestic Product of donor *i*, recipient country *j* and *w* of the world;

GDPpc*i* is GDP per capita of donor *i*, and GDPpc*j* is per capita GDP of recipient country *j*;

Dist*i*, Dist*j* is distance in nautical miles between donor country *i* and country *j*;

Rem*i*, is remoteness of donor *i* and Rem*j* is remoteness of recipient country *j*;

Lang*ij* is the common language factor between donor country *i* and recipient country *j*;

ε_{ij} is error term that affects the dependent variable and is time variant.

Extending the model to include the impact of aid (independent variable) on trade, based on the study by Wagner (2003), the model specifies that aid increases trade in an upward direction between the donor and the recipient or that aid reduces trade barriers. To explain the elasticity of aid impact the zero aid is defined using the method to handle the issue of no aid in the log term as log (1+aid) which than has all

positive values with large numbers (see Wagner, 2003. p.162). To address this no aid dummy is used which takes the value of 1 if aid from the donor$_i$=0, but takes the value of 0 if aid from donor$_i$ is > 0. The specification for trade–aid nexus takes the following form:

$$\ln T_{ij} = \ln \Gamma_{ij} + \beta_8 \ln(\max\{1,A_{ij}) + \beta_9 NAD_{ij} + \varepsilon_{3ij} \quad (3)$$

Incorporating the aid variables in the equation, the trade-aid framework is as follows:

$$\ln(T_{ij}) = \beta_0 + \beta_1 \ln(GDP_{ij}/GDP_w) + \beta_2 \ln(GDPpc_i) + \beta_3 \ln(GDPpc_j) + \beta_4 \ln(Dist_{ij}) + \beta_5 LnRem_i + \beta_6 LnRem_j + \beta_7 Lang_{ij} + \beta_8 \ln(\max\{1,A_{ij}\}) + \beta_9 NAD_{ij}\ \varepsilon_{4ij} \quad (4)$$

where $\ln \Gamma_{ij} = \beta_0 + \beta_1 \ln(GDP_{ij}/GDP_w) + \beta_2 \ln(GDPpc_i) + \beta_3 \ln(GDPpc_j) + \beta_4 \ln(Dist_{ij}) + \beta_5 Rem_i + \beta_6 Rem_j + \beta_7 Lang_{ij}$;

A_{ij} is the net ODA (in US$ constant prices 2010) given by donor *i* to recipient *j*;

NAD*ij* is dummy variable taking the value 1 if aid by donor *i*=0, and value of 0 if A*ij*>0;

All independent variables included are the parameters shown in equation (1)

The aid coefficient (β_8) indicates elasticity impact, β_9 aid value is zero, thus the log value of trade when aid is positive exceeds the log value of trade when aid is zero by $\beta_8 \ln(A_{ij} - \beta_9)$. The variables are representative of trade and aid linkages between the donor and recipient countries, trade facilitation factors and geographical constraints. The independent variables include GDP, GDP per capita, language, distance and remoteness. Distance leads to agglomeration, it is an important determinant of trade volume between countries in any region, and countries that are located closely together that tend to constitute a natural trading bloc (i.e. a reduction in trade barriers between them can give economic benefits).

Language reflects common languages spoken in the donor and recipient countries. The variables used for distance, remoteness and language are comprehensively discussed by Leamer (1977), Head, Ries and Wagner (1995), Nitsch (2000), Wager (2003) and Vijil and Wagner (2013). The panel data methodology captures the effect of changes in cross sectional attributes over time, variability within variables, reduces multicollinearity problem and analyses the effects of time variant factors. The pooled ordinary least squares (OLS) methodology has been used to estimate gravity model. Appendix Table A1 presents the variables, definition and data source.

Empirical Results

The empirical results are reported for the hypothesis of aid and trade linkages for the Australian and New Zealand trade and aid relationships for countries in South East Asia and South Pacific. The estimations for both models are undertaken using STATA. The tests for model diagnostics indicate no concern and the conventional tests for the goodness of fit criteria have a relatively high explanatory power. The estimated results (Tables 2 and 3) indicate that it is important to control for these factors given its correlation with aid and trade.

The first set of result (Table 2) shows the gravity model variables and its correlations with aid. With aid as the dependent variable the impact of each factor indicates the causality of the donor and recipient countries. The ln GDP$_i$ shows a positive impact of donor's GDP on aid allocations to SEA and SP countries. The coefficient though insignificant has a positive correlation with aid. The ln GDP$_j$ coefficient of recipient countries is positive and significant at the 5 percent level. This suggests that a 10 percent increase in recipients GDP increases the donor's aid to the recipient by 2.4 percent. The significant negative lnDist$_{ij}$ coefficient implies that farther the distance between the donor and recipient it reduces aid. The income per capita of the donor ln(GDPpc$_i$) is positive and insignificant, while the estimated income per capita of recipients ln (GDPpc$_j$) does not increase with aid. The language coefficient is positive but insignificant, thus there is no substantial barrier given the common language between donors (Australia, New Zealand) and the recipients (in SEA and SP region).

Table 2 Aid and Donor-Recipient Nexus, South East Asia and South Pacific Region

Dependent Variable: Log Net ODA		
Variable	*Coefficient*	*t ratio*
ln(GDP$_i$)	0.66	1.09
ln(GDP$_j$)	0.23	1.91**
ln(DIST$_{ij}$)	-3.15	6.99***
ln(GDPpc$_i$)	1.92	0.59

ln(GDPpc$_j$)	-1.10	4.26***
ln(Lang$_{ij}$)	0.08	0.03
C	3.59	0.45
Number of observations = 260		
Adj. R-square = 0.604		

Notes: ***, **, * Significant at the 1, 5 and 10% level, respectively.

The specification for aid-trade relationship examines if aid leads to an increase in trade between the donor and recipient countries. The model hypothesis assumes that aid increases trade positively that favours the donor through aid to the trading partner or it reduces barriers to trade. Using the OLS log models indicate the elasticity of aid coefficient and also the correlation between other independent variable (Table 3). The tied and untied aid data is not available thus net ODA data has been utilised to estimate the impact of aid on trade. The estimation also reports the panel OLS results using the residuals from imports based on the assumption that the unmeasured variables would on average affect imports the same way as it affects exports (Wagner, 2003, p.164).

The result for aid variable shows that ln(max{1,A$_{ij}$}) coefficient is positive and statistically significant at the 1 percent level, supporting the view that aid to the group of South East Asia and the South Pacific countries' increases exports from Australia and New Zealand. The estimated coefficient shows that an increase in aid by 10% increases exports to the recipient country by 1.2 percent. The implied return of exports on aid is estimated that shows the magnitude of how much exports should increase per dollar of aid by determining the predicted trade level to increase if aid increased by 1 percent (see Wagner, 2003). The estimated value for the implied return of exports is $0.96; this indicates that on average an additional dollar in aid would increase exports by a similar value ($0.96). Although the tied aid of Australia and New Zealand (for 2001 to 2010 period) ranged up to 15 to 17 percent (OECD, 2013), the results indicate that the return on aid is not so large than the tied component of their aid levels.

Table 4 Results for Trade-Aid Nexus, South East Asia and South Pacific Countries

Dependent Variable: Exports							
	Panel OLS			*Equation with import residuals*			
Variable	*Coefficient*	*t ratio*		*Coefficient*	*t ratio*		
Ln (max{1,A$_{ij}$})	0.12	2.41***		0.13	2.12**		
NAD$_{ij}$	0.53	1.55		0.67	1.44		
ln(GDP$_{ij}$/GDP$_w$)	-8.91	0.47		-1.04	0.51		
ln(DIST$_{ij}$)	3.45	0.20		-3.62	1.39		
lnRem$_i$	-9.92	0.53		-1.82	1.07		
lnRem$_j$	3.43	1.82*		2.83	3.32***		
ln(Lang$_{ij}$)	0.16	0.33		-2.13	0.22		
Import residual				0.16	0.46		
Constant	28.22	2.35**		22.38	3.76***		
Number of observations	260			Number of observations	260		
Adj R-square	0.81			Adj R-square	0.96		
Root MSE	0.3048			Root MSE	0.3089		
Implied 'returns' of exports on aid	$0.96			Implied 'returns' of exports on	$0.97		

Notes: ***, **, * Significant at the 1, 5 and 10% level, respectively.

The estimated NAD coefficient is positive and is not significant at the conventional level. The NAD coefficient is taken together to understand the relation to aid (i.e., ln(max{1,A$_{ij}$}), see studies by Nilsson, 1998, and Wagner, 2003). Donor remoteness coefficient (lnRem$_i$) is negative but insignificant. This may be the case as Australia and New Zealand has a geographic proximity with a regional interest in its aid allocation. The remoteness recipient coefficient is positive and significant (lnRem$_j$) which suggest that exports increase from the donors even if the recipients are more remote to the donor nations. Language is not much of a barrier to trade between the donors and the SEA and SP countries.

In addressing the trade-aid aspect the next set of variables are estimated with residuals from the imports in the same way that they affect exports. The aid coefficient $\ln(\max\{1,A_{ij}\})$ is positive and statistically significant (5 percent level). The coefficient shows that an increase in aid by 10% increases exports to the recipient country by 1.3 percent. The estimated value for the implied return of exports is $0.97; i.e., a value similar to that of earlier equation at $0.96 (on average) of exports produced per additional dollar increase in exports. The recipient remoteness coefficient ($\ln Rem_j$) is positive and significant, thus export increases from the donor to recipient despite their remoteness.

Conclusion

This study provides the analysis of aid and trade relationship using the gravity model. The results provide the motivation of aid and also the magnitude of return of exports on aid. The benefit from implied return of exports on aid for the donors is much larger on average as exports. Thus an additional dollar increase in aid by each dollar increase exports at a similar level even as tied aid of Australia and New Zealand ranged up to 15 to 17 percent. Aid and trade and not just aid for trade will work as the donors and recipient nations need to advance their trade linkages to enhance economic development improve social development. Both developed and developing countries strategic goals and projects are to create necessary conditions to achieve dynamic trade-related growth. Thus aid for development in the last decade has indicated the roadmap from both the donor and recipient for indicative aid allocations for specific development projects to enhance efficiency and effectiveness of aid.

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Appendix Table A1 Variables, Definition and Data Source

GDP for South East Asia & South Pacific Countries	Gross Domestic Product of recipient countries	http://data.worldbank.org/indicator /NY.GDP.MKTP.KD
GDP per capita for Australia and New Zealand	Income per capita of Australia and New Zealand	http://data.worldbank.org/indicator /SP.POP.TOTL
Gross GDP (world)	Gross Domestic Product of world	http://holtz.org/Library/Social%20Science/Economics/Estimating%20World%20GDP%20by%20DeLong/Estimating%20World%20GDP.htm
Exports and Imports	Total exports from donor country to recipient country; Imports is imports of donors from recipient countries	New Zealand: stats.govt.nz; Australia: http://www.abs.gov.au/websitedbs/ D3310114.nsf/home/home?opendocument
Distance	Great circle distance (in nautical miles) between capital countries of donor and recipient	World maps, see also Leamer (1977); Nitsch (2000)

Remoteness	remoteness of donor and recipient country	See Wagner (2003) and Vijil and Wagner (2012)
Language	Common language factor between the donor and recipient country	Head, Ries and Wagner (1998)