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Entering Global Value Chains: Do Trade Missions Work?[1]

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Abstract

We used matched firm-level data from the population of businesses in Australia to evaluate the impact that trade missions, operating 2010 to 2013, had on exports using a difference-in-difference method. We found that, on average, the missions increased participating firms' exports within 12 months by at least 172 per cent. Furthermore, trade mission participation appeared to increase the probability of becoming an exporter within 12 months by 26 percentage points. The additional effect of undertaking a subsequent trade mission was smaller than the first mission but still positive and statistically significant.

1. Introduction

Trade missions are structured, personal visits by groups of producers seeking new trade opportunities in foreign countries. For a country on the periphery of a trading bloc, remote in culture, language or location, missions can be effective way to initiate entry into global value chains. Notwithstanding evidence that it is only the most productive firms which export,[2] trade missions can provide the marginal advantage in customised trades where personal introductions, product quality and company reputation are critical.[3] The aim of this article is to evaluate whether trade missions do affect exports, or, whether they merely subsidise businesses that would otherwise export.

The most challenging issue in any evaluation is to establish the counterfactual – in our case, the level of exports if the same firm had not participated in the program. Taken literally, this counterfactual is not possible, but we can mimic the counterfactual by constructing a control group that is similar to the program participants with respect to the determinants of exporting.

Constructing a control group requires access to variables at the firm level. Prior to 2008, this data was not available to most researchers evaluation had to resort to industry or country-level data. Accordingly, evaluations were only able to assess contemporaneous bundles of export support programs. These bundles of programs extends well beyond trade missions and includes export-orientated programs around information provision, coordination, R&D, training, feasibility tests, technical and marketing services, technology acquisition, loan guarantees and interest subsidies, *inter alia*. We argue that because trade missions are specifically designed to insinuate a firm into global value chains, and given the rising importance of these chains, these missions deserve separate, highlighted treatment.

This evaluation differs from previous evaluations as it uses the full census of firm-level data relevant to the jurisdiction and also separately identifies trade mission participants. Focussing specifically on trade mission programs does not allow us to test for synergies between export programs (see Van Biesebroeck, Konings, and Volpe Martincus 2016), but does give the policy decision maker more concrete information about whether to continue to fund the program.

We find that on average, trade missions increased participating firms' exports within 12 months by at least 172 per cent. Furthermore, trade mission participation appeared to increase the probability of becoming an exporter within 12 months by 26 percentage points. The additional effect of undertaking a second mission was smaller than the first, but still positive and statistically significant.

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[2] Clerides, Lach and Tybout (1998); Bernard and Jensen (1995).

3 Volpe Martincus and Carballo (2012) find that export support programs are most effective for firms producing differentiated goods.

2. Why are trade missions so pertinent?

Since the 1970s, it has become increasingly common for a single product to consist of many inputs from a series of specialised countries. An assortment of terms has appeared in the literature to describe this phenomenon including: 'slicing up the value chain', 'disintegration of production', 'fragmentation', 'multi-stage production', and 'intra-product specialization' (see Feenstra 1998; Hummels, Ishii and Yi 2001). This international fragmentation of production is a corollary of the desire by companies to outsource parts, services or component assembly to expert suppliers. Falling trade barriers, most notably the reduction in tariffs and reduced transport and communication costs, have diverted much of this outsourcing offshore.

The result has been a major transformation in world trade. Global gross merchandise trade as a percentage of world output rose from 17.5 in 1960 to 45.0 in 2015.[4] Furthermore, the growing gap between gross and value-added world exports has implied that a disproportionate amount of the increased trade is due to the trade of inputs and components rather than finished goods (Johnson and Noguera 2014).

According to Bernard et al. (2007), results from virtually every study across industries find that only the most productive firms export which implies the presence of sunk entry costs into export markets. Chen, Lu and Zhou (2015) have argued that multinationals address these barriers by first offshoring to their foreign subsidiaries, and then as the product matures, to external foreign suppliers. If the traded product is customised, the quality of the relationship between the buyer and the seller can be the determining factor in a deal. Personal visits, mediated by the warm introductions offered in a trade mission, are designed to create these relationships.

3. Existing evidence

Although popular with government ministers and premiers, trade missions do not have to be run or subsidised by the public sector and can be operated by industry associations or for-profit companies. Nonetheless, regardless of which entity operates or pays for a mission, all parties, not the least the business itself, have a clear interest in knowing whether or not they succeed. Post-program surveys of grateful recipients of government largess do not constitute acceptable, objective evidence. Rigorous evaluations need be based on behaviour that is revealed through verifiable records such as sales or employment.

Trade missions are distinct from trade shows. Trade shows are mass many-to-many exhibitions, where the sponsor provides, or subsidises, booth space in a hall for complementary businesses to meet each other. Trade missions, in contrast, are bespoke organised trips to overseas destinations. The mission will introduce businesses to customers and business counterparts one-on-one, often in the latter's premises. Both shows and missions can be industry-focused and a specific export promotion program may exhibit the characteristics of both a trade show and trade mission.

The existing empirical evidence on the effect of trade missions is thin and mixed with most studies evaluating bundled export promotion programs. Nonetheless, the two developed economy evaluations specifically on trade missions comprise a country-level evaluation (Head and Ries, 2010, who find a statistically insignificant but small negative effect) and a survey of 113 participants (Spence, 2003, who reports positive effects).

[4] Source: World Development Indicators, World Bank, API_TG.VAL.TOTL.GD.ZS_DS2_en_csv_v2.zip World Trade Organization, and World Bank GDP estimates. Downloaded 9/12/2016. Note, merchandise trade only include trade in physical objects, not services nor capital transfers and foreign investments.

As mentioned, the more common approach, especially in developed country literature, is to evaluated export support programs as a bundle. The older studies also used aggregated national or regional data and again throw up inconclusive results. Gil, Llorca and Serrano (2007), for example, found that regional export promotion is associated with 74 per cent higher exports; Lederman, Olarreaga and Payton (2010) find country-level correlations between spending on export promotion programs and exports, but Bernard and Jensen (2004) using US state-level data do not. Rose (2007) and Creusen and Lejour (2012) both find a positive relation between the presence of a foreign trade office with exports to that destination. As correlations may indicate successful rent seeking by large exporter communities, these aggregate studies rarely provide the hard evidence needed to convince most policy decision makers.

Evaluations since 2008 have taken advantage of the bourgeoning availability of firm-level datasets (see Van Biesebroeck, Konings, and Volpe Martincus 2016 for a review). Almost all studies find a positive and significant effect of export promotion support on firm-level exports. However, as the above authors note, most studies only have data for firms which export, or are limited to a non-random sample of firms (e.g. Görg, Henry, and Strobl, 2008; Lach 2002; Van Biesebroeck, Yu and Chen 2015; Van Biesebroeck, Konings and Volpe Martincus 2016; Mion and Muûls 2015; Lederman, Olarreaga and Zavala 2016). Although relevant background for our question, these studies, some of which include trade mission programs, do not identify which types of export support are most effective.

Nonetheless, there are five published firm-level studies, all from South America, specifically evaluating trade missions. Volpe Martincus and Carballo (2008, 2010b, 2010c, 2012) and Álvarez and Crespi (2000) find consistently positive results, especially along the extensive margin (new export market entry or new product introduction to existing export markets). In this paper, we test for whether the same result can be found for a developed economy, Australia.

4. Evaluation method and data

As mentioned, the problem confronting evaluations based on observational data is that the counterfactuals, (what would have happened to the observed outcomes if the program were not implemented or if the participants did not participate), are never observed. The best we can do is to infer the counterfactuals from observing a group of non-participants which are similar, pre-program, in all the non-program determinants of the outcome. If program participation is not random, we need to account for the fact that the more capable, interested or talented businesses chose to do the program.

Once we have selected a control group from the pool of non-participants, we use difference-in-difference analysis to quantify the effect of program participation on the outcome, in our case exports. This standard approach to evaluation combines two methods, first, the use of a matched control group based on observable characteristics so we compare like-firms with like;[5] and second, the difference-in-difference estimator which eliminates time-invariant unobservables (Heckman et al. 1997). However, the estimated program effect can be biased if there remain unobserved time-varying firm-related factors which affect both program participation and export outcomes. This could be the sudden identification of an export opportunity by the firms' managers, or a change in the market circumstances for a specific niche.

[5] This means we do not have to extrapolate and infer, say, the program effect on a large firm from data on small firms.

The databases

Two firm-level data sets, linked by year and business identifier, forms the basis of the evaluation:

(i) The population of all 1192 businesses which participated in a trade mission with the Victorian Government between 1 December 2010 to 30 June 2013. Victoria is a state within Australia and has a population of about 6 million. Each trade mission comprises 20-100 businesses.

(ii) The population of all Australian businesses that completed a Business Activity Statement and Business Income Tax (BAS-BIT) database between 2001-02 and 2012-13 (over 19 million records).[6]

The BAS-BIT database includes a number of indicators of business performance including exports of goods and services; sales, turnover and effective full-time employment.[7] Unlike most firm-level datasets, our database contains businesses of all sizes. However, the database only records export revenues if the recipient of the good or service is outside Australia. This includes consultancy services, contract research or business services undertaken in Australia but paid for by an overseas company. Tourism and education services consumed in Australia by non-residents are not recorded in the BAS-BIT database as they are not tax-free[8]. Although this means service export sales are underestimated, at least relative to measured goods exports, this will not bias our results if the extent of underestimation stays constant before and after the program, and between the participation and control groups.

In 2011-12, the BAS-BIT database contains records of 2.5 million businesses in Australia. After removing records with zero values in sales, business income, total expenses, or salary and wage expenses we are left with 1.5 million Australian and 660 thousand Victorian businesses. Of the 1192 businesses that undertook a trade mission between 2010 and 2013, we were able to match 843 (of a possible 1192) unique trade mission businesses to the BAS-BIT database. This matching revealed that Manufacturing, Wholesale trade, Professional, scientific and technical services and Education and training were over-represented in the program compared with the total population. These industries represent Victoria's relative comparative advantage in terms of industrial capabilities. Three in four trade mission businesses are from services industry.

We do not expect program participants to be a random sample of all Victoria firms. To be eligible for the trade mission program, firms must be financially viable; be able to demonstrate a sound case for doing business in the targeted regions; and be currently exporting or able to demonstrate export readiness. Table 1 shows that program participants are much larger (sales are 70 times larger and employment is 30 times larger) and much more likely to be an exporter and export more. These comparisons indicate potential endogenous selection into program and a violation of the 'common trend' assumption which only holds if both program and control group exports would follow the same time trend in the absence of the trade mission program.

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[6] Note that the ABS BAS-BIT database is large and complex and can only be accessed by approved researchers indirectly via staff from within the ABS. The database is confidential and non-ABS analysts cannot see the data. Results are only released to non-ABS people after careful scrutiny of the output to ensure no business can be identified. These access limitations do not affect the quality of the empirical analysis due to our detailed and thorough analysis.

[7] Exported goods are GST-free if they are exported from Australia within 60 days of one of the following, whichever occurs first: the supplier receives payment for the goods or the supplier issues an invoice for the goods. Other exports generally include supplies of things other than goods or real property for consumption outside Australia, such as services, various rights, recreational boats, financial supplies and other professional services.

[8] Goods and services tax.

Table 1: Number of Victorian businesses and average firm characteristics 2001-02 to 2012-13, by trade mission participation status, (T = Trade mission participants; C = Control)

	Number of businesses		Proportion of exporters (%)		Exports sales ($ thousands)		Total sales revenues ($ millions)		Employment (EFT persons)	
Year	T[9]	C	T	C	T	C	T	C	T	C
2001-02	424	397,189	41	3	20600	87	137.0	1.4	577	11
2002-03	459	440,022	43	3	15200	70	122.0	1.4	622	10
2003-04	501	488,299	41	3	15400	75	126.0	1.5	465	10
2004-05	525	493,570	43	3	17400	82	128.0	1.7	735	15
2005-06	552	548,418	42	3	16700	78	125.0	1.7	314	9
2006-07	589	613,271	42	2	11600	2	121.0	1.7	302	8
2007-08	646	666,195	43	2	14000	77	119.0	1.8	290	8
2008-09	657	676,267	40	2	13500	93	148.0	1.7	326	8
2009-10	713	626,120	43	2	7926	127	146.0	1.9	323	8
2010-11	772	646,030	44	2	8684	161	170.0	1.9	315	9
2011-12	821	661,278	44	2	7725	185	158.0	2.0	318	9
2012-13	795	656,152	45	2	6419	161	154.0	2.1	323	9

Notes: Constructed based on merged Victorian Government trade mission program administrative database and cleaned version of BAS-BIT database for the State of Victoria. The total number of businesses may not be identical to the official ABS' estimate of number of businesses in Victoria in each financial year.

5. The model

Denote program participation D_{it} where $D_{it} = 1$ if firm i participates in the Victorian Government trade supported program in year t and $D_{it} = 0$ otherwise. Denote X_{it} as a vector of observed covariates corresponding to observable firm and program characteristics. Denote Y_{it}^1 as the observed outcome (say, export revenues) and Y_{it}^0 as the unobserved (counterfactual) outcome. Hence, denote $E\left(Y_{it}^1 | X_{it}, D_{it} = 1\right)$ as the observed average outcome of participating firms conditional on X_{it} and $E\left(Y_{it}^0 | X_{it}, D_{it} = 1\right)$ as the counterfactual average outcome of participating firms had they not participated. Note that, for a given firm we either observe Y_{it}^1, or Y_{it}^0 , but not both variables at the same time.

Then, the impact of trade promotion program is measured by the average treatment effect on the treated (ATT) denoted by τ:

$$\tau = E\left(Y_{it}^1 | X_{it}, D_{it} = 1\right) - E\left(Y_{it}^0 | X_{it}, D_{it} = 1\right) \quad (1)$$

In equation (1) τ, measures the average change in the outcomes of participating firms as the difference between observed average outcomes after treatment and counterfactual average outcomes had the fir τ ms not received the treatments. It is clear from the equation that to obtain an unbiased estimate of we need an unbiased estimated of $E\left(Y_{it}^0 | X_{it}, D_{it} = 1\right)$, the counterfactual. An obvious candidate is to use the average outcome of a selected group of non-participants. This control group would need to be identified by taking into account any potential non-randomness in program participation. The

[9] As mentioned in the preceding paragraph, 843 business which participated in the Trade Missions program and recorded in the DEDJTR database were found in the ABS BAS-BIT database. However, some of these have missing values in terms of the matching variables such sales revenues, wages/employment or export for various reasons. For example, some of the businesses may not exist prior to 2010-11 or they may exist under different ABNs. As a result, the figures reported in the columns with the "P" heading (that is, the number of participants) decrease as we move away from the VIC Trade Mission Years (2010-11 to 2012-13).

descriptive statistics presented in Table 1 show that the differences between participants and non-participants appear do not appear to be random. [10]

In other words, we need to select the control group such that firm's heterogeneous characteristics are comparable in both groups. As mentioned, we will do this first by selecting a control group which matches the participation group on observable factors that we believe determine exporting. We use propensity score matching which is estimated as the predicted probability of a firm to participate in the program based on observed co-variates, X. For each year, the co-variates vector X_{it} consists of total sales revenues, whether or not an exporter, import values, total wages paid, share of foreign ownership and one-digit industry code. Thus, X_{it} measure size and the extent of international engagement of the firms within each broad industry.

Using only the years before Victorian Trade supported program begun (that is, data from 2009 or earlier), we compute the pre-2009 average values of each components in X_{it} across the years for each firm. Denote this average values as X_{ipre}; this covariate vectors is the independent variables for the propensity score matching.

Using only the data from the participation and control groups we estimate the DID estimator as:

$$Y_{it} = X_{it}\beta + \tau D_{it} + \mu_i + \lambda_t + \varepsilon_{it} \qquad (2)$$

Note that in specifying equation (2), we assume the conditional expectation function $E(Y|X, D)$ is linear and any unobserved firm characteristics is decomposable into a time-invariant firm specific fixed effects (μ_i), common across firms year effect (λ_t) and a random component (ε_{it}). The introduction of the covariates (X) linearly may lead to inconsistent estimate of τ due to potential misspecification (Meyer, 1995; Abadie, 2005) if we had not limited our estimation sample with the matching analysis.

The *matching difference-in-difference* method can estimate treatment effects without imposing the linear functional form restriction in the conditional expectation of the outcome variable is (Arnold and Javorcik, 2005; Gorg et al 2008). The matching method part controls for endogenous selection into programs based on observables (Heckman and Robb, 1985; Heckman et al 1998). The difference-in-difference part controls for endogenous selection into programs based on time invariant unobservables. Note however that we still need to assume that there is no time varying unobserved effects influencing selection and exports (see Heckman et al., 1997; Blundell and Costa Dias, 2002).

6. Evaluation Findings

Impacts on export revenues

We obtained eight sets of DID impact estimates by comparing Victoria Trade Missions participants to different sets of non-participants produced by different matching methods. We refer to these eight sets of impact estimates as Model 1 to Model 8 estimates.

In Model 1, we did not perform any matching. All available non-participating firms were used as the control group. In the rest of the models we used matching.[11] In Model 2 we used the nearest neighbour

[10] As a stylised fact, exporters, from all countries, are larger (on the basis of employment and tangible assets); employ more skilled and well-paid workers and are more likely to be foreign owned and part of a multi-plant enterprise (Bernard and Jensen, 2004; Roberts and Tybout, 1997; Wagner 2007; Bernard et al., 2007; Görg, Henry, and Strobl, 2008). Moreover, exporting is a persistent process: today's exporters are more likely to export tomorrow, which suggests the influence of the fixed and sunk costs of exporting; and the managerial or product orientation towards export markets (Bernard and Jensen, 2004; Timoshenko 2015, Kaiser and Kongsted 2008, Padmaja, and Sasidharan, 2016).

[11] See the discussions in Appendix 1 and 2 for more details.

based on estimated propensity scores. In Model 3 we used five nearest neighbours based on estimated propensity scores. In Model 4 we used one Coarsened Exact Matching (CEM) matched non-participant for each participant. In Model 5 used all CEM matched non-participating firms. Models 6-8 are similar to Models 2-4 respectively, except for the addition of two time-varying control variables (firm age and size of employment). These eight sets of estimates of the impacts of Victoria Trade Mission program on the participants' export sales are summarised in Table 2.

Table 2: Average increase in export sales of Victoria Trade Missions participants, 2010-2013, per cent.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
0-12 months								
Average	135	219	192	186	138	**172**	161	157
Lower 95%-CI	117	117	141	103	120	60	85	51
Upper 95%-CI	152	321	244	269	156	284	237	263
0-24 months								
Average	165	345	226	291	174	343	224	332
Lower 95%-CI	139	198	170	172	147	151	131	142
Upper 95%-CI	190	491	281	409	200	535	316	522

Notes: Estimates are based on difference-in-difference analysis of participating Victorian firms compared to different sets of non-participating Victorian firms Model 1 uses all non-participating firms as control group. Model 2 uses one propensity score matched non-participating firm for each treated firm as control. Model 3 uses five propensity score matched non-participating firms. Model 4 uses one Coarsened Exact Matching (CEM) matched non participant. Model 5 uses all CEM matched non-participating firms. Models 6-8 are similar to Models 2-4 respectively, except for the addition of two time-varying control variables (firm age and size of employment). Lower and upper bounds (Lower 95%-CI and Upper 95%-CI) are approximated 95% confidence intervals.

Table 2 shows that regardless of the method use, the average impact of the trade mission program on export revenue is positive and significant both in terms of magnitude and statistical significance. Before controlling for selection on observables, participants had on average 135 per cent (see Model 1) higher export revenue within 12 months compared with the control group. The corresponding 95% confidence interval was 117 to 152 per cent. The estimated impact within 24 months was higher at an average of 165 per cent. However, moving from a one-year to a two-year period only added around 30 percentage points to the impact which is less than the 135 per cent initial impact in the first year.

Model 2 (and its more robust version Model 6) should provide the most reliable impact estimates as the control group showed no statistically significant difference to the program participants in terms of pre-program export performance. On average, the impact estimates produced by Models 2 and 6 were 186 and 172 per cent respectively. However, their 95% confidence intervals were also wider, suggesting that we need to take into account of the range of the impact estimates. Nevertheless, even the most conservative estimates summarised in Table 2 above (which is 51 per cent according to Model 8's lower bound) suggests that the trade mission participation had a significant positive impact.

The average exports sale of participants in the base year (that is pre-program participation) was $809,662. Based on the most conservative model specification, Model 6 (which is the more restrictive version of the preferred Model 2), in monetary terms trade mission participation increased participants' exports sales by at least 60% x $809,662 = $485,797 within 12 months and 151% x $809,662 = $1,222,590 within 24 months.

Table 3 compares the estimates found by this study with the self-reported estimates from a survey administered by the Victorian Government. It shows that the reported increase in exports is within the range of our estimates (closer to the lower bounds of the DID impact estimates). This finding supports the notion that the self-evaluation data reported by participants can be valuable.

Table 3: Average increase in the value of export sales of Victorian trade mission participants, 2010-2013, as reported by participants and estimated by this evaluation

	Average increase in export sales

	Reported by participants	This evaluation's most-conservative estimates
Immediate Export Sales	$212,476	Not estimated
Within 1-12 Months	$565,592	60.0% x $809,662 = $485,797
Within 13-24 Month	$1,116,893	Not estimated
Within 0-24 Month	$1,317,355	151% x $809,662 = $1,222,590

Notes: Estimates are based on difference-in-difference analysis of participating Victorian firms compared to different sets of non-participating Victorian firms (see the notes for Table 5.1). The impact elasticities used in the third column (117.4% and 139.4%) correspond to the smallest 95% confidence interval lower bounds summarised in Table 5.1.

7. Impacts on the probability of exporting

Approximately half of program participants were not exporters in the base year. Using this natural variation in the data, we have derived DID impact estimates using the probability of being an exporter as the export performance measure (instead of the value of exports).

The results, summarised in Table 4, presents five sets of estimates corresponding to Models 1-5 discussed above.[12] Based on the preferred specification of Model 2, trade mission participation increased the probability of becoming an exporter by 26 percentage points within 12 months (approximately 53 per cent increase) and 35 percentage points within 24 months (approximately 71 per cent increase).

Table 4: Increase in probability of export of Victorian trade mission participants, 2010-2013, by empirical model specification, percentage points.

	Model 1	Model 2	Model 3	Model 4	Model 5
0-12 months					
Average	21	26	26	24	20
Lower 95%-CI	15	17	18	15	18
Upper 95%-CI	26	35	34	33	21
0-24 months					
Average	26	35	32	34	25
Lower 95%-CI	18	26	24	24	18
Upper 95%-CI	33	45	39	43	32

Notes: Estimates are based on difference-in-difference analysis of participating Victorian firms compared to different sets of non-participating Victorian firms (see the notes for Table 5.1). No results for Model6-8 due to non-convergence issues. Lower and upper bounds (Lower 95%-CI and Upper 95%-CI) are approximated 95% confidence intervals.

8. Repeat and multi-year participations

Some businesses participated in more than one mission. Over the evaluation period, 442 out of 1192 participating businesses participated more than once, with the average number of missions per participating business being 1.7. Thus, it is of a particular interest to know if those repeat participants experience higher impacts to one-off participants. It is not possible to separate the impacts of repeat participations within the same year,[13] however, for multi-year participation (regardless how many

[12] Models 6-8 estimates are unavailable due to convergence issues in estimating the conditional logit model when the two time varying variables (age and employment).

[13] Technically speaking, the time invariant indicator status of participants with and without repeat participation is differenced out by the DID analysis.

trade missions attended within each year) we can obtain separate estimates for the first year of participation and the second year of participation.

The estimates for first year participation is summarised in Table 5 below.[14] These estimates show diminishing returns to trade mission participation. The increase in export sales from participation in the second year (or more) was on average around 50 per cent smaller than the increase from participating only in one year.

Table 5: Average increase in export sales of Victoria Trade Missions participants in the first and second (or more) year of participation, 2010-2013, per cent.

	Model 1
First year participation	
Average	248
Lower 95%-CI	136
Upper 95%-CI	359
Second (or more) year of participation	
Average	110
Lower 95%-CI	2
Upper 95%-CI	218

Notes: Estimates are based on difference-in-difference analysis of participating Victorian firms compared to different sets of non-participating Victorian firms. Lower and upper bounds (Lower 95%-CI and Upper 95%-CI) are approximated 95% confidence intervals.

9. Robustness and limitations

In general, program impact evaluation with observational data (that is, where the analyst had no direct control on the data generation process or on how the samples whose data being observed were selected) suffers from potential selection bias due to observed and unobserved factors that affect both decision to participate in the program and the intended outcomes from the program. For example, program eligibility, incentives and expectations may lead to participants being systematically different from non-participants in such a way that a naïve comparison of the performance of participants and non-participants would lead to biased estimates of the program's impact. As mentioned above, in order to be eligible for the trade mission program, firms must be financially viable; be able to demonstrate a sound case for doing business in the targeted regions; and be currently exporting or able to demonstrate export readiness. These characteristics were not observable in our database, but as they determine program participation, they are likely be correlated with outcomes.

In this evaluation, we implemented difference-in-difference analysis in order to eliminate the influence of unobserved and time-invariant factors (factors which do not change over time but determine whether or not a firm participated in the program and are correlated with the outcomes being evaluated) by comparing the change in the performance of the participant before and after the program to the change in the performance of non-participants. Effectively, we difference out any time-invariant confounding effects that could lead to biased estimates.

However, we still had to deal with potential bias caused by unobserved but time-varying factors. Furthermore, implicit in the difference-in-difference analysis is a common trend assumption: that the changes in the performance of both participants and non-participants are the same in the absence of the program intervention. In practice, we ensure that the common trend assumption was not violated

[14] These estimates are based on the preferred Model 2 specification.

by selecting only 'similar' non-participants as the control group. To do this, we applied two different matching techniques (propensity score matching and coarsened exact matching) on observed pre-program businesses characteristics that were likely to be related to decision to participate in the program. To handle the first problem of unobserved time-varying confounding effects, we estimated the impacts of the program conditional on two observed time varying variables which are likely to be correlated with the unobserved time-varying factors: business age and employment size.

Therefore, we believe our estimates were robust to different potential bias sources: observed or unobserved and time-varying or time-invariant. The robustness of our findings was further evidenced by the relatively similar results exhibit by our use of different model specifications to control these sources of bias (Model 1–Model 8) and different measures to derive impact estimates (export sales and export probabilities, 0-12 and 0-24 months, Year 1 and Year 2+, and the approximated 95% confidence interval).

There are some limitations to this evaluation, mostly related to data availability. First, while we knew the destination countries of trade missions, we did not know the export destination. One may expect that a participation in a trade mission to China would be more likely to increase export to China than to other countries. Globalisation in value chains of production may temper this direct relationship partly, but it remains that if we knew export destination we might be able to obtain a more precise estimate (in terms of its causality relationship) of the program impact. To address this limitation requires the BAS-BIT database to be supplemented with detailed customs data. We believe this is feasible since the information is collected by Australian Customs office and the ABS has a plan to merge the customs database with the BAS-BIT database.[15]

Another limitation of the current evaluation that is related to data availability is the small sample size of program participants (relative to the sample size of non-participants). There are potentially interesting aspects of different trade missions such as destination countries mentioned above and characteristics of the trade events themselves (which industry, regional or country specific, which delegates from other countries participate, which country officials were met, and many others). An analysis of the roles of these factors on the impact of trade missions would yield interesting implication to improve program design and targeting. However, such analysis is omitted due to limited sample size and information.

10. Conclusion

This evaluation supports the case for trade missions run through industry associations or for-profit organisations: on average businesses that participate in a mission more than double their exports. We believe that this occurs because personal contacts made during the missions overcome some of the additional information costs associated with doing business in foreign markets. These costs include establishing a relationship of trust; identifying potential customers and understanding their nuanced requirements.

However, the question for policy makers is: should these visits be subsidised by the public purse? For public support to be justified, we have to make a case that there are positive spillovers from these relationships. These spillovers may occur when a demonstration by one firm is copied by its peers or when foreign contacts are shared. We have not established the presence of spillovers and this remains a subject for further research.

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[15] However, there is no announced date when this will happen.

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