

The relative performance and characteristics of Australian firms that used the 457 temporary skilled visa program

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Abstract

The now concluded sub-class 457 temporary skilled migrant visa program was used to provide Australian businesses with a means to address short-term skill shortages. Due to micro-data limitations there has been a lack of empirical research on the program. This paper circumvents this limitation by linking unpublished data from the Department of Home Affairs, which was previously the Department of Immigration and Border Protection (DIBP) on 457 migrant sponsoring firms to financial information on these sponsoring firms from the Business Longitudinal Analysis Data Environment (BLADE). This allows for a more detailed characterisation of these firms and the identification of any performance differentials between sponsoring and non-sponsoring firms. The results reveal that relative to similar non-sponsoring firms, sponsors performed better, although it is unlikely that this performance differential was exclusively due to temporary skilled migrants.

JEL Codes: J44, J61, L25

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Australia has for a number of years utilised a temporary skilled migrant visa program to provide Australian businesses with access to labour with specialised skillsets that were deemed to be in short supply. These temporary migrants were sponsored by Australian employers via a sub-class 457 visa and were entitled to work and stay in Australia for up to four years. The 457 visa program was introduced in 1996 and was in effect for over 20 years. In March 2018 the federal government announced abolishment of the 457 visa program to be replaced by the new Temporary Skill Shortage (TSS) visa scheme.

The conclusion of the 457 program provided an opportunity to retrospectively analyse the program to see how firms that sponsored the temporary skilled migrants fared. An area where there is sparse empirical research. This lack of research is primarily due to a lack of publically available data. Existing data sources such as the Census of Population and Housing, the Continuous Survey of Australian Migrants (CSAM) and the Household Income and Labour Dynamics Australia (HILDA) survey do not adequately capture information on 457 migrants and specifically, the Australian businesses that sponsor and employ them.

This research paper draws on unpublished administrative data from the Department of Home Affairs – which was referred to as the Depart of Immigration and Border Protection (DIBP) at the time of analysis – on 457 migrant sponsoring employers to financial information from tax data on these sponsoring businesses from the Business Longitudinal Analysis Data Environment (BLADE).¹ Doing so results in a longitudinal data set that allows for the comparison of aspects of business performance such as turnover, employment, wage per employee and labour productivity. This allows for a comparison of the performance of 457 migrant sponsoring businesses with otherwise similar businesses that did not sponsor 457 migrants. This paper aims to inform policy and the wider discourse on migration policy via this retrospective analysis, it also demonstrates the viability of using administrative data when data from more traditional sources is unavailable.

This paper begins by providing an overview of the 457 program, and its evolution over the years. This is followed by an outline of the data linking methodology. Salient recent statistical characteristics of the 457 sponsoring businesses relative to all industry benchmarks are presented next. This is followed by the results from the quasi-experimental matching estimation which establishes a synthetic counterfactual to assess performance differentials between sponsoring and non-sponsoring firms,

1 The results of this study are based, in part, on Australian Business Register (ABR) data supplied by the Registrar to the ABS under A New Tax System (Australian Business Number) Act 1999 and tax data supplied by the ATO to the ABS under the Taxation Administration Act 1953. These require that such data is only used for the purpose of carrying out functions of the ABS. No individual information collected under the Census and Statistics Act 1905 is provided back to the Registrar or ATO for administrative or regulatory purposes. Any discussion of data limitations or weaknesses is in the context of using the data for statistical purposes, and is not related to the ability of the data to support the ABR or ATO's core operational requirements. Legislative requirements to ensure privacy and secrecy of this data have been followed. Only people authorised under the Australian Bureau of Statistics Act 1975 have been allowed to view data about any particular firm in conducting these analyses. In accordance with the Census and Statistics Act 1905, results have been confidentialised to ensure that they are not likely to enable identification of a particular person or organisation.

followed by a brief discussion and some concluding remarks. The terms ‘firm’ and ‘business’ and their plurals are used as synonyms throughout this paper.

The 457 program

Prior to discussion of the data and results some context is provided. This section draws on the work of Campbell and Tham (2013) who provided a comprehensive overview of the 457 program, as well as Larsen (2013) and DIBP (2017). As pointed out in Campbell and Tham (2013) the genesis of the 457 program can be traced back to the 1995 inquiry report into the Temporary Entry of Business People and Highly Skilled Specialists (Parliament of Australia, 1994). The report which is often referred to as the ‘Roach Report’ — named after Neville Roach, the chair of the inquiry — recommended a streamlining of migration procedures particularly those related to temporary skilled migration in order to address skills shortages and maintain the international competitiveness of Australian businesses. The incoming Coalition government adopted the recommendations of the Roach Report and introduced the 457 visa program in 1996.

The reliance by firms on temporary skilled migrants is not an intrinsically Australian phenomena, other advanced economies have also made use of schemes to source skilled labour from overseas. For example, the most notable of these is the H1-B visa in the United States which has been a mainstay of the US higher education, software development and IT industries. The United Kingdom has also made use of tiered work permit programs, Canadian employers can also temporarily sponsor foreign workers as part of the global talent stream. While the mechanics of each of these visas and programs varies according to the context of each country, their motivations were similar to the 457 program in Australia, requiring an eligible employer to sponsor a migrant worker based on a set criteria.

Given its twenty year history the 457 visa program went through a number of notable revisions that were implemented in response to evolving labour market trends and economic conditions. A comprehensive review or discussion of the evolution of the 457 program is beyond the scope of this paper. However, the salient features and notable legislative changes to the program, as well as recent summary statistics from the program are presented in this section.

Despite revisions over the last twenty years the core aspects of the program remained broadly the same. The 457 program was an uncapped, demand (employer) driven program. To make use of the program Australian businesses had to register with the immigration department and be approved and maintain their status as a sponsoring business. They could then lodge applications to sponsor overseas workers with skillsets that were deemed to be in short supply in the Australian labour market. In the final stage of the sponsorship process the overseas worker would lodge a linked visa application to the immigration department.

Sponsoring businesses were required to demonstrate that employment of overseas workers on 457 visas would be beneficial to Australia by resulting in the creation or maintenance of employment for local workers, and/or the introduction of

new or improved technologies or business skills. The program required a commitment from sponsoring employers in terms of training local employees particularly by leveraging off the skills of sponsored overseas workers to reduce the prevalence of skill shortages and reliance on migrant labour in the long run. The program also stipulated that the number of 457 sponsored workers by a business should not exceed a 'reasonable proportion' of the workforce of a sponsoring business in order to minimise crowding out of suitable local workers. Additionally sponsoring employers were obligated to offer the same broad employment and wage conditions to sponsored workers as their local workers.

457 visas could be granted for a maximum of four years with the possibility of renewal. Visa holders were able to:

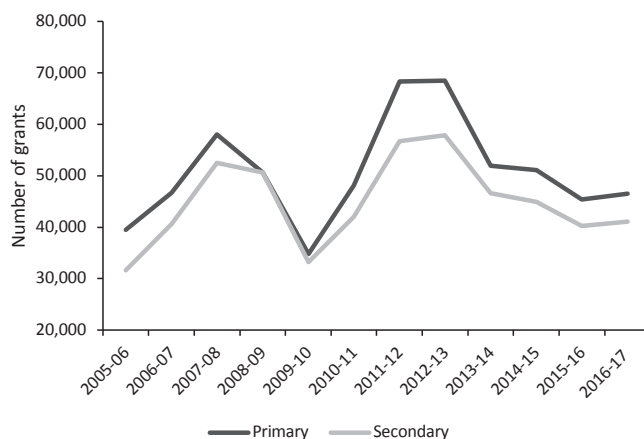
- work in Australia for an approved sponsor for the life of their visa
- bring their family to work or study in Australia
- travel in and out of Australia as often as they liked
- apply for permanent residency (PR) at a later stage as long they satisfied the pre-requisites for PR.

Additionally visa holders had to maintain their employment with their sponsor, or find employment with another approved sponsor within 60 days of ceasing employment with their initial sponsor. They were also required to obtain and maintain licences, registrations and accreditations necessary for their nominated occupation.

Notable revisions to the 457 program occurred in 2001 and 2003 which collapsed the business sponsor categories from two to one and relaxed the sponsorship requirements for regional areas. Later revisions, notably in 2007 and 2009 rolled back some of the earlier changes by strengthening the obligations of sponsoring employers in terms of compliance, particularly towards their sponsored employees. A requirement was imposed on sponsors that a nominated sponsored position for an overseas worker could not be approved unless the terms of employment and employment conditions offered to the sponsored employee were at least as favourable as those provided to local workers. The revisions also guaranteed a base rate of pay for 457 migrants that needed to be greater than an indexed temporary skilled migrant income threshold (TSMIT). The latter revisions also rolled back regional concessions and imposed English language requirements as well as introduced formal skills assessments for certain (but not all) occupations for which overseas skilled workers could be sponsored.

As shown in Figure 1, in recent years the intake of 457 migrants exhibited cyclicity, with the use of the program waning in the wake of the Global Financial Crisis (GFC) and picking up particularly during the mining boom years. Despite trending downwards since the winding down of the resources boom, in recent years, 457 visas grants have outnumbered permanent migrants by a ratio of three to one (Gregory, 2014), however when the inflows and outflows of 457 migrants (the stock) is taken into consideration, 457 migrant stocks have been stable in recent years (Short, 2017).

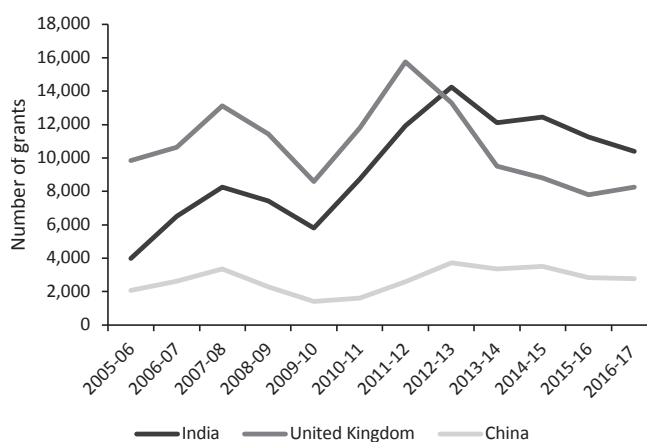
Figure 1: 457 visa grants by financial year



Source: DIBP (2017) Subclass 457 visas granted pivot table. Department of Immigration and Border Protection, Canberra

In terms of the origin of 457 sponsored migrants, the program attracted migrants from a diverse range of nationalities although as shown in Figure 2 in recent years, India, the UK and China have been the three largest sources of temporary skilled migrants, accounting for 47 per cent of all grants in 2016-17. With temporary migrants from India surpassing those from the UK in recent years and Chinese migrants maintaining a relatively consistent trend.

Figure 2: 457 primary visa grants by financial year – top three source countries



Source: DIBP (2017) Subclass 457 visas granted pivot table. Department of Immigration and Border Protection, Canberra

All Australian industrial sectors made use of the 457 program although not to the same extent and with varying intensity of use in recent years. Table 1 reports the top ten sponsoring industries for 2016-17. Additionally 457 migrants sponsored by the Mining industry peaked in 2011-12 with approximately 6,400 primary grants (9.4 per cent of total annual 457 grants) and with the winding down in mining investment subsequently trending downwards to a relatively lower 1,000 grants in 2016-17 (2.2 per cent of total annual 457 grants).

Table 1: 457 visa primary grants by top 10 sponsoring industries, 2016-17

	<i>Per cent of 2016-17 grants</i>
Other Services	17.3
Professional, Scientific and Technical	13.2
Information Media and Telecommunications	12.9
Accommodation and Food Services	11.0
Health Care and Social Assistance	10.6
Construction	7.3
Education and Training	5.4
Manufacturing	4.3
Financial and Insurance Services	3.7
Retail Trade	3.5

Notes: Proportions reported relate to total primary grants across all industries in 2016-17.

Source: DIBP (2017) Subclass 457 visas granted pivot table. Department of Immigration and Border Protection, Canberra

In terms of nominated occupations, Table 2 reports the top ten occupations along with their skill level. Recent statistics from DIBP (2016) also reveal that the bulk of nominated positions were located in New South Wales (43 per cent), Victoria (25 per cent) and Western Australia (13 per cent).

Table 2: 457 primary visa grants by top 10 nominated occupations, 2016-17

	<i>Per cent of 2016-17 grants</i>	<i>ANZSCO skill level</i>
Software and Applications Programmers	17.3	1
General Practitioners and Resident Medical Officers	13.2	1
Cooks	12.9	3
ICT Business and Systems Analysts	11.0	1
University Lecturers and Tutors	10.6	1
Café and Restaurant Managers	7.3	2
Advertising and Marketing Professionals	5.4	1
Management and Organisation Analysts	4.3	1
Accountants	3.7	1
Chefs	3.5	2

Notes: Proportions reported relate to total primary grants across all industries in 2016-17. Smaller values of ANZSCO skill levels represent higher skills, e.g. an occupation with a skill level of 1 is considered more skill intensive and technical than an occupation with a skill level of 2 and so on. ANZSCO skill levels range from 1 to 5.

Source: DIBP (2017) Subclass 457 visas granted pivot table. Department of Immigration and Border Protection, Canberra

On 18 April 2017 the Federal Government announced the abolishment of the 457 program, which was replaced by a dual stream Temporary Skill Shortage (TSS) visa in March 2018 (DIBP, 2017). The new TSS visa is a part of reforms which strengthen the integrity and quality of temporary and permanent skilled migration. Notable new reform measures introduced via the TSS included:

- more targeted occupation lists from which occupations can be nominated
- a two year mandatory work experience requirement relevant to the nominated occupation
- limited (one) onshore visa renewal for migrants under the TSS Short-Term stream
- extension of the permanent residence (PR) eligibility period from two to three years
- removal of PR pathway for TSS Short-Term Visa holders with the pathway only available to TSS Medium-Term visa holders
- introduction of a non-discriminatory workforce test to prevent employer discrimination against suitable Australian workers
- a requirement for sponsored migrant workers to pay a contribution to the newly created Skilling Australians Fund
- Stricter English language requirements requiring a higher level of proficiency for the TSS Medium-Term stream.

These recent changes to skilled migration policy and the availability of a new source of unit record data on Australian firms provides an opportunity to conduct a preliminary analysis of performance differentials between Australian businesses that employed 457 workers and those that did not. Such an analysis at the micro level

has thus far proved difficult due to a lack of unit-record data. The motivation of this research paper is to introduce a viable new source of data that can help in this regard, establish a baseline for future analysis, once the TSS matures, and introduce a compact methodology for contributing evidence on this issue that can inform subsequent debate.

Previous research on 457 migrants

There is no shortage of academic research on skilled migrants in the Australian context. However, the majority of this research considers the labour market outcomes of skilled migrants from various background and cohorts, particularly in the context of their earnings and employment outcomes relative to each other and to local workers. See for example, Chiswick and Miller (2009); Miller and Neo (2003); and Rafi (2016).

More recently, given their increasing numbers relative to other streams of skilled migration, 457 migrants have been the subject of academic research. Gregory (2014) identified the increasing importance of 457 migrants in the labour force and provided insights into the employment outcomes of 457 migrants. Notably Gregory (2014) identified the lack of suitable micro-data on 457 migrants that limits the scope of quantitative analysis on 457 migrants. Other authors have attempted to qualitatively assess and analyse issues surrounding the 457 program such as attitudes towards and perceptions of the program from the perspective of Australian employers, the migrants, and the wider community, See for example Bahn, Barratt-Pugh, and Yap (2012); and Parham, et.al. (1999). The vulnerability and precariousness of 457 migrant workers from certain backgrounds, such as Indians in the Australian labour market has also been discussed by Velayutham, (2013).

Temporary skilled migrants have also featured in economy wide impact analyses and Computable General Equilibrium (CGE) modelling such as that commissioned by the Centre for International Economics (CIE, 2013) for the New South Wales economy and the Productivity Commission (2006) as part of their reviews and reports on Australia's migrant intake and population growth. With the CIE reporting that in the absence of skilled and business migration (which includes 457 migrants) the NSW economy would be 2.3 per cent smaller in terms of its Gross State Product (GSP) and the welfare of NSW residents (proxied by real household consumption) would be lower by 3.6 per cent.

DIBP (nd.) has also contributed in this area by producing quarterly reports, and provision of detailed statistics on the 457 visa program via publically available pivot tables, and publishing findings from occasional surveys of cohorts of 457 sponsors and sponsored employees.

Despite an increasing body of qualitative and quantitative research on 457 migrants most of this research is still focused on the labour market outcomes of 457 migrants and their impact on the Australian labour market. There is comparatively limited empirical research from the perspective of sponsoring employers (the firms), primarily due to limited availability of micro level data. Given the strong reliance on the program by Australian employers, the recent development of the ABS BLADE offers an opportunity to address this gap.

Data

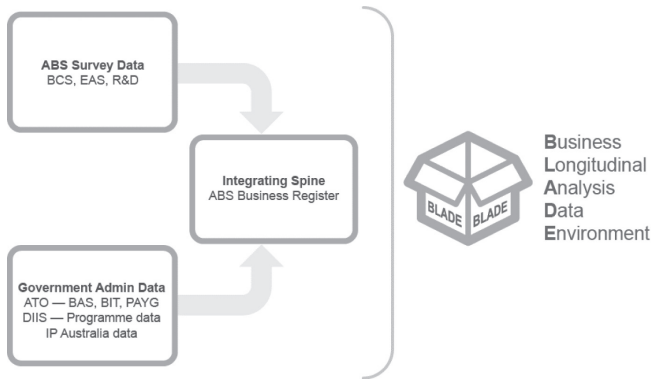
This research primarily draws on firm-level data from the ABS Business Longitudinal Analysis Data Environment (BLADE) and unpublished data from the DIBP on employers who sponsored 457 visa migrants. Figure 3 provides a graphical overview of BLADE which is best thought of as a diverse and evolving data asset that consists of a collection of interlinked data-sets.

BLADE contains administrative data on more than two million actively trading Australian businesses. It includes Australian Taxation Office (ATO) data, IP Australia data and some Department of Industry, Innovation and Science (DIIS) program data. The bulk of BLADE data items are sourced from the ATO from:

- **Business Activity Statements (BAS)** that are submitted by businesses to report their Goods and Services Tax (GST) obligations. Examples of data items included are total sales, export sales, wages & salaries, capital & non-capital purchases
- **Business Income Tax (BIT)** forms that are submitted by businesses to report taxable income or loss on one of four form types (Company, Partnership, Sole Trader, and Trust)
- **Pay as you go (PAYG)** statements provided by businesses to report personal income tax obligations of their employees. This is used to model Full-Time Equivalent (FTE) and derive employment headcounts.

Additionally program data from government departments such as the Department of Industry, Innovation and Science is also being integrated with BLADE. Each data-set within BLADE can be used on its own, although the true utility of BLADE is facilitating analysis on custom data-sets that draw information from a diverse array of sources such as ABS data, ATO data and data from other sources such as program data from government departments. This is facilitated by using the ABS Business Register (ABSBR) and the associated Australian Business Numbers (ABNs) as the integrating spine that allows for the linking of diverse pieces of information on the same ABN from different data-sets.

Figure 3: An overview of BLADE



Notes: BCS refers to the Business Characteristics Survey, EAS refers to the Economic Activity Survey, BAS refers to Business Activity Statement, BIT refers to Business Income Tax, and PAYG refers to Pay as you go.

Source: DIIS (2017)

The ability to integrate data with BLADE and the financial data from the ATO available within, makes BLADE particularly suited for the current research which attempts to assess the differences in performance between firms that made use of 457 visa workers and those that did not. The DIBP collects ABN information on Australian employers that sponsored 457 migrants, and this information for financial years 2005-06 to 2013-14 was shared with the ABS for linking to the ATO data available in BLADE. Due to technical challenges in integrating the tax data, at the time of estimation, ATO data within BLADE was not available for more recent financial years.

Upon linking of the DIBP and ATO data, the researchers were provided access to a custom data-set within BLADE that notably included:

- The number of 457 primary applicants sponsored by a business in a given financial year (the visa count)
- Financial variables such as annual turnover, capital and non-capital expenditure, and export sales for each business
- The annual wage bill of each business, and derived measures of employment on a full time equivalent (FTE) basis.

This resulted in a longitudinal data set that allows the performance of firms that made use of 457 workers to be tracked and analysed over time relative to firms that did not make use of the 457 program. Prior to a discussion of the insights and results generated from this linked longitudinal data-set it is worthwhile to briefly discuss the two broad cohorts of firms in BLADE.

The firms included in the ABSBR consist of non-profiled (simple) firms and profiled (complex) firms. Non-profiled firms have simple structures and conduct

business under just one ABN. Profiled firms on the other hand have complex structures with multiple types of activity units (TAUs) conducting business under multiple ABNs potentially across multiple industries, markets and regions as part of an enterprise group (EG). Profiled firms are a minority of all Australian firms, although they do tend to be larger and for these firms the ABS maintains its own units structure through direct contact with businesses. This research project limits its scope to the non-profiled (simple) firms due to the difficulty of disaggregating 457 visa counts for each complex firm across its various TAUs. It is hoped that further refinements to the linked data will allow for an analysis of these complex firms. Readers interested in knowing more about BLADE are referred to Hansell and Rafi (2017) who discuss the ABS data linking methodology, salient features of BLADE as well as the current access mechanisms that are available to researchers who wish to conduct analysis using BLADE.

The next section of this paper presents descriptive statistics from the linked BLADE-DIBP data to establish some aggregate characteristics of 457 migrant sponsoring firms.

Descriptive Statistics

This section describes the 457 visa sponsoring businesses in terms of their business and financial characteristics and also compares these characteristics with other non-sponsoring Australian businesses that were similar to the 457 visa sponsoring firms. To improve the quality of the comparison the linked dataset is trimmed by:

- Only considering simple (non-profiled) businesses for both sponsoring and non-businesses. This is done to avoid the problem of misattribution that occurs with complex firms with multiple TAUs as discussed in the previous section
- Excluding businesses that did not report their wages (from which estimates of FTE are derived) as otherwise it is not possible to segregate firms by employment size cohorts. Given the complex nature of analytical issues associated with large businesses, this study focuses only on Small to Medium Sized Enterprises (SMEs) that employed less than 199 persons
- Excluding firms that, in any given financial year, had a sponsored visa count to employment (FTE) ratio of greater than one. A visa count to FTE ratio that is greater than one implies that a business sponsored more 457 migrants than its total workforce. This was the case for a very small minority of 457 sponsoring businesses in the linked BLADE-DIBP data-set. There are a number of potential reasons for this, notably, such businesses could be labour hire or contracting firms that sub-contract migrant employees or source them on behalf of other businesses. Any sponsoring business with a visa count to FTE ratio greater than one is removed from the merged data. This is unlikely to change the overall pattern of the statistics presented as such businesses were a very small minority of the data
- Finally, any firm for which there is no Industry classification is also removed from the data. Such firms were again a small minority of the linked DIBP-BLADE data-set.

Characteristics of 457 migrant sponsoring firms

It must be noted that the descriptive statistics presented below relate to the characteristics of 457 sponsoring businesses from the linked BLADE-DIBP data-set. They are not analogous to the visa grant statistics that are reported by the DIBP, and hence should not be seen as a substitute for them.

Table 3 gives the characteristics of 457 visa sponsoring firms. There was a significant increase in the number of Australian businesses that sourced specialised skills from overseas during the period 2005-06 to 2013-14 — the number of businesses that sponsored temporary skilled migrants more than doubled during this period from 4,896 to 11,988 businesses. In terms of the number of migrants sponsored, in any given financial year, almost three fourths of the sponsors hired only one temporary skilled migrant and 15 per cent of Australian businesses sponsored two temporary skilled migrants. On average, only one tenth of Australian businesses sponsored more than two temporary skilled migrants in a financial year.

Within SMEs, there was not much variation between business size and the proclivity to sponsor 457 migrants. However, micro (1-4 employees) Australian businesses increased their reliance on the 457 program in more recent years accounting for a 12 per cent increase in sponsorships between 2010-11 and 2013-14. The proportion of medium (20-199 employees) businesses decreased by 11 per cent during the same period, while the proportion of small (5-19 employees) businesses showed no significant change during that period.

One stark feature that is apparent from the statistics in Table 3 is the decline in the proportion of exporting firms involved in sponsoring 457 migrants, which decreased significantly from 28.4 per cent in 2005-06 to 16.1 per cent in 2013-14. There are a number of potential reasons for this such as, the impact of the Global Financial Crisis, changes in non-trading sectors looking to produce goods and services using more innovative methods, business reorientation to satisfy domestic demand rather than foreign demand, and or changes to consumers taste and preferences for products involving the use of specialised skilled workers.

Table 4 shows that the proportion of visa sponsoring firms also varied among industry sectors and there were significant changes in the use of 457 visa temporary skilled migrants over time. Professional, Scientific and Technical services (PST), Accommodation and food services (AFS) and manufacturing (MFG) were the top three industry sectors that were involved in sponsoring 457 visas in 2005-06. However, by 2013-14, only PST and AFS remained within the top three. In AFS, a significantly higher proportion of Australian businesses recruited overseas skilled workers in 2013-14 (21.7 per cent) compared to 2005-06 (13.4 per cent). Whereas in PST the proportion of 457 sponsoring businesses decreased from 20.5 per cent to 13.6 per cent during the same period. There was a significant decrease in manufacturing sector as well.

Table 3: Attributes of 457 migrant sponsoring businesses

<i>Attribute</i>	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Total number of sponsors	4,896	6,335	8,648	7,939	5,435	6,950	9,165	10,177	11,998
457 migrants sponsored (per cent)									
<i>One</i>	70.4	70.7	69.6	72.1	77.5	72.1	66.7	64.9	74.3
<i>Two</i>	15.0	14.4	15.4	14.8	12.2	14.7	16.6	18.5	15.8
<i>Three to four</i>	8.3	8.7	8.8	8.0	6.3	8.0	9.9	10.7	6.7
<i>Five to ten</i>	4.7	4.7	4.9	3.9	3.1	4.1	4.8	4.6	2.5
<i>Ten plus</i>	1.8	1.5	1.7	1.1	0.9	1.2	2.0	1.5	0.8
Business size (per cent)									
<i>1-4 employees</i>	18.7	18.9	17.9	16.2	14.7	16.1	17.2	20.2	27.9
<i>5-19 employees</i>	39.7	40.6	40.0	41.2	39.9	39.9	39.1	39.0	39.4
<i>20-199 employees</i>	41.7	40.5	42.1	42.6	45.4	44.0	43.6	40.8	32.7
Exporter (per cent)	28.4	25.6	24.7	24.2	25.4	24.3	21.7	18.7	16.1

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset.

Statistics not directly comparable to official DIBP visa grant statistics.

Source: Author's calculations using the integrated BLADE dataset.

Table 4: 457 migrant sponsoring businesses by industry

<i>Attribute</i>	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Total number of sponsors	4,896	6,335	8,648	7,939	5,435	6,950	9,165	10,177	11,998
Agriculture, Forestry and Fishing	1.7	2.0	1.7	1.8	1.5	1.3	1.4	1.8	1.9
Mining	1.1	1.4	1.7	1.6	1.8	1.9	1.8	1.5	0.9
Manufacturing	10.5	11.5	11.5	11.0	8.6	8.4	8.7	8.4	7.5
Electricity, Gas, Water and Waste Services	0.3	N/A	0.3	0.3	0.2	0.3	0.3	0.3	0.2
Construction	7.7	8.4	8.7	9.3	10.0	11.5	11.6	11.0	9.5
Wholesale Trade	9.5	8.8	8.8	8.6	9.3	8.4	8.7	7.9	8.0
Retail Trade	6.4	5.7	5.9	5.2	5.1	5.0	5.8	6.8	7.0
Accommodation and Food Services	13.4	14.3	13.2	12.7	8.6	9.7	13.2	18.2	21.7
Transport, Postal and Warehousing	2.2	2.4	1.9	1.9	2.1	1.7	1.6	1.8	2.2
Information, Media and Telecommunications	1.9	1.8	2.0	2.0	2.0	1.8	1.7	1.5	1.3
Financial and Insurance Services	3.3	3.0	2.8	2.9	3.3	3.0	2.6	2.3	2.4
Rental, Hiring and Real Estate Services	1.7	1.8	1.8	1.8	1.6	1.8	2.0	1.9	2.0
Professional, Scientific and Technical Services	20.5	19.5	19.3	20.8	22.6	22.8	19.2	15.7	13.6
Administrative and Support Services	6.3	5.6	5.4	5.1	5.6	6.0	5.5	5.7	5.4
Public Administration and Safety	0.3	N/A	0.4	0.5	0.6	0.4	0.5	0.5	0.4
Education and Training	3.4	2.8	3.0	3.1	4.0	3.6	3.0	2.8	2.6
Health Care and Social Assistance	3.8	4.2	4.3	4.7	6.6	6.3	5.3	5.4	5.6
Arts and Recreation Services	1.2	1.2	1.3	1.1	1.4	1.5	1.4	1.1	1.3
Other Services	4.8	5.4	6.1	5.7	5.0	4.7	5.8	5.4	6.6

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset.

Statistics not directly comparable to official DIBP visa grant statistics.

Source: Author's calculations using the integrated BLADE dataset.

Financial characteristics of sponsoring firms

Table 5 compares selected financial characteristics of 457 visa sponsoring businesses and non-sponsoring businesses (mean value comparison). Several financial characteristics were available in BLADE to compare the performance of 457 visa sponsoring businesses including turnover, capital expenditure, exports, wages and employment. Table 5 gives the mean values of these financial variables for the period from 2007-08 to 2013-14 and also for other Australian businesses. Table 5 indicates that on the whole 457 visa sponsoring businesses performed better than non-sponsoring Australian businesses across all indicators. On average, 457 migrants sponsoring businesses had higher turnover, employment and wages, additionally on average they generated more export revenue (albeit still modest) and recorded a higher capital spend.

Table 5: Financial attributes of 457 sponsoring businesses relative to similar non-sponsoring businesses, mean values

<i>Sponsoring businesses</i>						
	<i>Count</i>	<i>Turnover (\$m)</i>	<i>Capital expenditure (\$m)</i>	<i>Exports (\$m)</i>	<i>Wages (\$m)</i>	<i>Employment</i>
2007-08	31,219	7.5	0.3	0.5	1.1	23.1
2008-09	32,821	7.6	0.3	0.5	1.2	22.9
2009-10	33,855	7.4	0.3	0.4	1.2	22.7
2010-11	34,535	7.9	0.3	0.5	1.3	24.5
2011-12	34,856	8.7	0.3	0.6	1.5	25.2
2012-13	35,332	8.9	0.3	0.5	1.6	25.9
2013-14	34,999	9.4	0.3	0.6	1.7	26.0
<i>Non-sponsoring businesses</i>						
	<i>Count</i>	<i>Turnover (\$m)</i>	<i>Capital expenditure (\$m)</i>	<i>Exports (\$m)</i>	<i>Wages (\$m)</i>	<i>Employment</i>
2007-08	682,959	1.4	0.1	0.0	0.2	4.6
2008-09	682,807	1.5	0.1	0.0	0.2	4.5
2009-10	687,275	1.5	0.1	0.0	0.2	4.5
2010-11	690,146	1.6	0.1	0.1	0.3	4.6
2011-12	689,984	2.0	0.1	0.1	0.3	4.7
2012-13	691,015	1.9	0.1	0.1	0.3	4.9
2013-14	705,585	1.8	0.1	0.1	0.3	4.9

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset. Statistics not directly comparable to official DIBP visa grant statistics.

Source: Author's calculations using the integrated BLADE dataset.

Two financial characteristics (mean turnover and mean employment) were also compared with other similar Australian businesses by business size and across industry sectors to understand these businesses characteristics further.

Table 6 reveals that, mean turnover of 457 visa sponsoring firms was always higher than other similar Australian non-sponsoring firms, even after controlling for business size. In general, the larger the firm size, the higher the mean differences in turnover between the two types of firm suggesting that 457 visa sponsoring firms perform better than similar non-sponsoring firms, although given data limitations this comparison is unable to control for other factors that may be responsible for this difference.

Table 6: Comparison of turnover by business size (\$ million), mean values

<i>Year</i>	<i>Micro</i>		<i>Small</i>		<i>Medium</i>	
	<i>Sponsors</i>	<i>Non-sponsors</i>	<i>Sponsors</i>	<i>Non-sponsors</i>	<i>Sponsors</i>	<i>Non-sponsors</i>
2007-08	1.2	0.5	3.4	2.3	17.7	15.0
2008-09	1.1	0.5	3.2	2.3	18.2	16.8
2009-10	1.1	0.5	3.1	2.3	18.3	15.6
2010-11	1.2	0.6	3.2	2.4	18.7	15.8
2011-12	1.1	0.7	3.1	2.4	19.9	23.3
2012-13	1.1	0.5	3.1	2.5	19.7	22.0
2013-14	1.1	0.5	3.3	2.8	20.5	18.6

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset.

Statistics not directly comparable to official DIBP visa grant statistics.

Source: Author's calculations using the integrated BLADE dataset.

In terms of differences in mean employment between sponsors and non-sponsors, Table 7, reveals that mean FTE employment in 457 visa sponsoring firms were always higher than non-sponsoring firms for the seven year study period irrespective of firm size indicating that on average the sponsoring firms employed more than non-sponsoring business, although the difference is modest, particularly at the micro and small business level.

Table 7: Comparison of employment (FTE) by business size, mean values

<i>Year</i>	<i>Micro</i>		<i>Small</i>		<i>Medium</i>	
	<i>Sponsors</i>	<i>Non-sponsors</i>	<i>Sponsors</i>	<i>Non-sponsors</i>	<i>Sponsors</i>	<i>Non-sponsors</i>
2007-08	2.3	1.5	10.2	8.8	53.1	40.6
2008-09	2.3	1.5	10.2	8.7	53.0	40.6
2009-10	2.2	1.5	10.2	8.7	53.0	40.7
2010-11	2.2	1.4	10.2	8.7	53.3	41.2
2011-12	2.2	1.4	10.2	8.8	54.3	41.9
2012-13	2.3	1.4	10.1	8.8	54.3	41.9
2013-14	2.4	1.5	10.1	8.8	54.4	42.2

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset. Statistics not directly comparable to official DIBP visa grant statistics.

Source: Author's calculations using the integrated BLADE dataset.

Industry sector performance of 457 visa sponsoring businesses are presented in Tables 8 and 9. Comparisons indicate that 457 visa sponsoring firms perform better in turnover and employment in all six key industry sectors that made relatively higher use of the 457 program. The widest difference in turnover is observed in Wholesale Trade while the widest difference in employment is observed in Manufacturing. However the difference in turnover and employment is clear to observe in other sectors as well such as PST, Construction and Retail Trade.

Table 8: Comparison of turnover for selected industries (\$ million), mean values

Year	Manufacturing			Construction			Wholesale trade			Retail trade			AFS			PST		
	Sponsors	Non-sponsors		Sponsors	Non-sponsors		Sponsors	Non-sponsors		Sponsors	Non-sponsors		Sponsors	Non-sponsors		Sponsors	Non-sponsors	
2007-08	9.3	2.0		7.5	1.2		18.6	4.5		11.5	2.0		2.3	0.9		5.2	0.7	
2008-09	9.3	2.0		7.7	1.2		18.9	4.6		11.6	2.0		2.3	0.9		5.4	0.8	
2009-10	8.8	2.0		7.4	1.2		17.9	4.7		12.0	2.1		2.3	0.9		5.6	0.9	
2010-11	9.4	2.1		7.9	1.1		19.1	5.0		11.9	2.1		2.4	0.9		6.0	0.9	
2011-12	9.8	4.6		9.0	1.2		22.2	5.4		12.4	2.2		2.4	1.0		6.4	1.3	
2012-13	9.8	2.3		9.2	1.2		20.8	5.4		12.9	2.3		2.5	1.0		6.7	1.3	
2013-14	10.2	2.4		10.5	1.3		22.9	5.8		12.7	2.4		2.5	1.0		6.9	1.2	

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset.
Statistics not directly comparable to official DIBP visa grant statistics.
Source: Author's calculations using the integrated BLADE dataset.

Table 9: Comparison of employment (FTE) for selected industries, mean values

Year	Manufacturing		Construction		Wholesale trade		Retail trade		AFS		PST	
	Sponsors	Non-sponsors	Sponsors	Non-sponsors	Sponsors	Non-sponsors	Sponsors	Non-sponsors	Sponsors	Non-sponsors	Sponsors	Non-sponsors
2007-08	30.2	7.7	21.2	3.6	26.1	6.6	21.0	4.8	15.0	4.9	22.6	3.6
2008-09	30.0	7.5	20.7	3.5	26.5	6.5	20.5	4.8	14.5	4.9	22.7	3.5
2009-10	29.4	7.4	20.5	3.5	26.0	6.5	20.9	4.8	14.3	4.9	22.3	3.4
2010-11	30.5	7.6	22.0	3.5	27.3	6.6	21.5	4.8	14.5	4.9	23.6	3.5
2011-12	31.1	7.8	24.5	3.6	28.0	6.8	22.6	4.9	14.4	5.1	25.5	3.6
2012-13	31.3	7.8	26.2	3.7	28.8	6.9	23.9	5.0	14.4	5.1	26.2	3.7
2013-14	31.2	7.9	26.4	3.8	29.0	6.9	24.0	5.2	14.3	5.2	26.1	3.8

Notes: Statistics relate to simple (non-profiled) businesses from the linked BLADE-DIBP dataset.
Statistics not directly comparable to official DIBP visa grant statistics.
Source: Author's calculations using the integrated BLADE dataset.

Establishing a counterfactual

The descriptive statistics presented in the previous section suggest that 457 sponsoring businesses were generally larger and out-performed similar non-sponsoring businesses.

As an additional robustness check to ascertain whether performance differences do in fact exist between businesses that sponsor and employ 457 migrants and those that do not, a nearest-neighbour matching estimator is used to establish a synthetic counterfactual. This is done to minimise the presence of any selection biases that might be responsible for the performance differences observed in the descriptive statistics.

This is a similar methodology to Rafi (2017) and draws upon the work of Abadie and Imbens (2002), Abadie et.al. (2004), and Caliendo and Kopeinig (2008) who discuss the theoretical underpinning and mathematical notation of matching estimators.

For an individual firm, $i = 1, \dots, N$, with all units exchangeable, let:

$\{Y_i(0), Y_i(1)\}$ denote the two possible outcomes, namely $Y_i(0)$ is the outcome when an individual firm does not sponsor a 457 migrant and $Y_i(1)$ is the outcome when it does.

The average treatment effect (ATE) can then be expressed as the difference between the two outcomes:

$$\tau = E\{Y(1) - Y(0)\}$$

However, when estimating the ATE, only one of the two outcomes is observed. Intuitively, at a given point in time, if an individual firm chooses to be a 457 migrant sponsoring firm then it cannot also be non-sponsoring firm. At a point in time, for an individual firm the two outcomes are mutually exclusive. The observed outcome can be denoted as:

$$Y_i = Y_i(W_i) = \begin{cases} Y_i(0) & \text{if } W_i(\text{non-sponsor}) = 0 \\ Y_i(1) & \text{if } W_i(\text{sponsor}) = 1 \end{cases}$$

Since only one of the two outcomes is observed we must estimate the other unobserved potential outcome for each individual firm in the sample.

If the decision to sponsor is random for individual firms with similar characteristics (often referred to as pre-treatment variables or covariates) then the average outcome of similar firms that were non-sponsors can be used to estimate the unobserved outcome for the sponsoring firms.

To ensure that the matching estimators identify and consistently estimate the treatment effects, it is assumed that:

For all x in the support of X ,

W (Decision to sponsor or in general the ‘treatment’) is independent of $(Y(0), Y(1))$ conditional on $X = x$. This is referred to as un-confoundedness or ‘selection on observables’.

Additionally it is also assumed that:

$$c < \Pr(W = 1 | X = x) < 1 - c, \text{ for some } c > 0$$

This is referred to as the identification assumption, and states that the probability of assignment to the treatment is bounded away from 0 and 1. This assumption is also known as the overlap assumption. Essentially the overlap assumption must hold otherwise, if all businesses with similar characteristics (covariates) choose the treatment (sponsored, probability of 1) or did not receive treatment (chose not to sponsor, probability of 0), there would be no observations on similar businesses in the opposite outcome category which could be used for comparison.

The nearest neighbour matching estimator uses a scaling matrix S to determine the distance between vector covariate patterns (characteristics) to weight observations and find a close match for each individual firm from the other group (treated or untreated). Specifically, the Mahalanobis Distance, which is the inverse of the sample covariate covariance matrix is used:

$$S = \frac{(X - \bar{x}'1_n)'W(X - \bar{x}'1_n)}{\sum_i^n w_i - 1}$$

Where 1_n is an $n \times 1$ vector of ones, $\bar{x} = (\sum_i^n w_i x_i) / \sum_i^n w_i$, and W is an $n \times n$ diagonal matrix containing frequency weights.

The following firm characteristics are used for matching:

- firm size, established via full-time equivalent employment numbers at the time of matching
- industry sector, as given by the four-digit ANZSIC for a finer comparison
- a measure of past performance, proxied by the change in turnover in the two years prior to matching.

Additionally, the matching exercise selects a very specific cohort of sponsoring businesses to control for further unobservable effects that might lead to selection bias and/or identification issues. Notably, it is possible that differences in firm performance arise not only due to the use of 457 migrant workers but also due to the timing of sponsorship. It is possible that businesses that sponsored 457 workers at different points in time had differing performance characteristics, not only relative to non-sponsoring firms but also to each other. For example, a business that sponsored 457 migrants prior to the GFC could have differing levels of performance relative to a business that made use of the program post GFC. Similarly the legislative changes to the 457 program over its many years may also have impacted on firm's decision to use 457 workers at different points in time. To control for this, the two cohort of firms to be matched are defined as:

- firms that only first made use of (sponsored) 457 migrants in 2010-11
- the pool of non-sponsoring firms for the financial year 2010-11 from which the counterfactual is drawn. Which consists of firms that have never sponsored a 457 migrant at any point prior or subsequent to 2010-11.

In this particular case each observation from the sponsoring group of firms is matched to at least three close observations with similar characteristics from the non-sponsoring group of firms based on the Mahalanobis Distance. The outcomes for the nearest neighbours are then averaged and compared against the outcome for each sponsoring firm.

Nearest neighbour matching is implemented with replacement, which means that each observation from the untreated group can potentially be used as a match more than once. This results in reduced bias in the estimator and a higher quality match although it does increase the variance of the estimates. However, this issue becomes less serious in large datasets, such as the one used for this paper.

Compared to other matching estimators such as propensity score matching, nearest neighbour matching has some advantages. By not imposing any functional form assumptions, the nearest neighbour matching estimator is more flexible relative to propensity score matching. This implies that it can be used to estimate treatment effects for a much wider class of models. However the drawback is that the nearest neighbour estimator requires much more data, and the bias in the ATE estimate starts to increase as more continuous covariates are added to the model (Huber, 2015). However, for this particular research, the advantages of the nearest neighbour matching estimator outweigh the negatives — there are a sufficiently large number of untreated non-sponsoring firms in the BLADE data to draw a counterfactual from, furthermore the continuous covariates (number of FTEs, past turnover performance) are bias adjusted when matching to overcome one of the key limitation of nearest-neighbour matching.

To assess whether there were any persistent differences in the performance of businesses sponsoring 457 visa migrant workers relative to similar non-sponsoring businesses, the three year forward change in turnover, employment (FTE), wage per FTE, and labour productivity — between 2010-11 and 2013-14 — were selected as the outcome variables in the matching estimation — with the treatment effects for these outcome variables used to assess differences in performance between sponsors and non-sponsors.

Assessing the evidence for any performance differentials

Table 10 reports the ATEs for the outcome variables for all ANZSICs as well as for certain selected ANZSICs. The results are robust to heteroscedasticity and outlier analysis was used to trim the distributions for key variables to minimise the influence of extremely small or large values. Continuous variables used for nearest neighbour matching were further bias adjusted to overcome one of the major limitations of the nearest-neighbour estimator.

In terms of basic intuition, for 457 sponsoring businesses, the ATEs for the outcome variables provide an assessment of whether change in turnover, employment,

wage per FTE and labour productivity three years onwards from 2010-11 was more or less than the counterfactual (non-sponsoring businesses). The magnitude and sign of the ATE is important in assessing performance differences. A positive (greater than 0) ATE implies that for sponsoring businesses the forward change in the outcome variable was greater or higher than the counterfactual and indicative of better performance.

The results presented in Table 10 suggest a difference in turnover and employment performance of 457 sponsoring business relative to non-sponsors. However the ATEs for distinct ANZSICs exhibit more variability in terms of magnitude and statistical significance. In terms of statistical significance, evidence for additionality in performance is strongest for the forward change in turnover and employment and less so for wage per FTE and labour productivity.

Across all ANZSICs the ATE for turnover shows that the three-year forward change in turnover was on average \$ 146,000 higher for the sponsoring firms relative to the non-sponsoring firms. Within ANZSICs there was marked variability with the forward change being \$668,000 higher for sponsors in Wholesale Trade, \$186,000 higher for sponsors in Construction and \$194,000 higher for sponsors in PST. This preliminary research could not establish statistically significant evidence of differences in forward turnover performance for other key sponsors of 457 migrants such as businesses in the Accommodation and Food Services industry.

In terms of employment, the ATEs from the matching estimation also suggest a modestly better performance in terms of employment creation by 457 migrant sponsoring businesses. Prior to matching, for sponsoring businesses, their total number of FTEs is adjusted downwards by the number of 457 migrants sponsored each year. *Essentially the treatment effect for employment (FTE) for the sponsoring firms is net of the number of 457 migrants sponsored in any given financial year.* The treatment effect for FTE therefore suggests that even after controlling for the number of 457 migrants sponsored, on average across all ANZSICs the three-year forward change in employment was 1.5 FTE higher in the sponsoring businesses relative to the non-sponsoring firms. While there is some variability in the FTE forward change across key industries, in general the results in Table 10 suggest that the additional employment generated by sponsoring firms is modest relative to the non-sponsoring firms, although very statistically significant.

The evidence is considerably less statistically significant for any performance premium in terms of the forward change in wage per FTE and labour productivity. However the treatment effects for wage per FTE for Manufacturing, Retail Trade, and PST suggests that three years onwards from 2010-11, 457 sponsoring businesses in these three industries on average paid a higher wage per employee. Overall, however, the statistical evidence is tenuous to suggest that growth in wage per employee was higher in 457 industries relative to the counterfactual. One possible reason for this is likely to be the relatively rigid and regimented nature of certain aspects of the Australian labour market such as the Awards system and other forms of wage arbitration, which on average results in broadly similar cohorts of Australian businesses paying similar wages.

Similarly, the matching estimation does not find definitive statistic evidence that change in labour productivity three years onwards from 2010-11 was higher in the

457 firms relative to the counterfactual. The only sponsoring industry that returned a statistically significant results was Manufacturing where on average the forward change in labour productivity was \$17,500 higher (in terms of value-added per employee) for sponsoring firms relative to the counterfactual. There are a number of possible interpretations of this result, first, that there is little difference in the labour productivity of 457 sponsoring and non-sponsoring firms, second, it is more likely that the lack of statistically significant labour productivity differentials is a consequence of measurement issues particularly for services industries and the proxy chosen to derive labour productivity from the financial data (Turnover less other non-capital expenditure per FTE). This issue requires further research and a more nuanced empirical model beyond the exploratory approach of this paper.

Table 10: Average treatment effects for 457 sponsoring firms by industry

ANZSIC	Average Treatment effect				Number of firms	
	Turnover (\$)	FTE	wage per FTE (\$)	value-added per FTE (\$)	Sponsors	Non-sponsors
Manufacturing	58,000	0.85	***	17,500	194	21,260
Construction	186,000	**	***	-11,900	289	44,702
Wholesale trade	668,000	***	***	30,000	192	16,625
Retail trade	233,000	**	***	-5,840	131	30,089
Accommodation and food services	52,400	1	***	2,840	207	14,990
Professional, scientific and technical services	194,000	**	***	5,110	415	39,844
Administrative and support services	116,000	2.5	***	-7,200	111	11,884
Health care and social assistance	90,000	0.6	***	14,000	177	26,288
Other services	180,000	***	***	6,240	121	22,671
All ANZSICs	146,000	***	***	3,000	2,230	312,772

Notes: *** significant at 1 per cent, ** significant at 5 per cent, * significant at 10 per cent.

FTE is a measure of employment and stands for 'Full Time Equivalent'

Source: Author's calculations using the integrated BLADE dataset.

Discussion and caveats

The descriptive statistics and the matching estimation of the preceding sections establish that there are performance differentials between firms that sponsored 457 migrants and those that did not, particularly in terms of turnover and employment performance. This is evident across a number of ANZSICs, firm size classes and time periods. It would be tempting to assert that this performance differential is exclusively due to the use of sponsored 457 migrants, however this is unlikely. The use of 457 migrants is certain to have contributed to helping preserve and grow a businesses' competitive advantage but there are other potential factors that help explain these performance differentials, notably differences in managerial ability, business age, product mix and life cycle, and the human capital and experience of existing employees (including permanent skilled migrants). Controlling for factors such as these in the analysis, particularly the matching estimation would assist in further isolating the impact of 457 migrant sponsorship on firm performance. Unfortunately, given current data limitations it is not possible to control for many of these factors as while BLADE data is rich in financial information from taxation data it is fairly limited in terms of other variables that help shed light on the labour mix, production technology, and managerial quality of a business. Future developments in terms of the development of a longitudinal linked Employer-Employee Dataset (LLEED), and the recently completed ABS Management Capability Survey will allow for any subsequent research on the impact of skilled migrants on business performance to be more definitive.

Even if performance differentials are not exclusively due to 457 migrants, the sponsorship of 457 migrants by the relatively better performing firms is an interesting research finding. The findings of this paper establish that there is a cohort of firms that is performing better relative to their peers and the recent changes to skilled temporary migration could potentially have implications — positive or negative — for this better performing cohort of firms. It is too early to assess the impact of these changes, however the policy desire to better attune skilled migration policy is likely to have maximal impact if it also aligns with the strategic aims and motivations of Australian businesses in terms of affording them labour market flexibility and access to critical skills in short supply.

In this regards this paper adds value to the academic and policy discussion by identifying a gap in the literature in terms of the assessment of the firm-level impacts of migration policies. Furthermore this paper highlights the utility of administrative data as a rich vein of information that can assist researchers in terms of quantifying and assessing these impacts. There is considerable scope to refine the current research, notably in terms of controlling for the additional factors identified above and also by broadening the scope of the research to include the larger, complex (profiled) firms within BLADE.

Conclusion

This paper provided a summary of the salient characteristics of the 457 program over the two decades of its operation. Despite its use by a variety of Australian industries and businesses there has been a lack of quantitative research on 457 migrants, employers, and industries. This is primarily due to a lack of suitable micro-data on 457 migrants and sponsoring employers. This paper partly circumvented this limitation by making use of linked administrative data, and provides a compact methodological framework for assessing research questions such as the presence and extent of performance differentials between firms that sponsored 457 migrants and those that do not. The findings of this paper suggest that 457 sponsoring firms outperform non-sponsoring firms, however it is unlikely that 457 migrants are the exclusive source of this performance premium.

References

- Abadie A and Imbens G (2002) *Simple and bias-corrected matching estimators for average treatment effects*, National Bureau of Economic Research Cambridge, Mass., USA
- Abadie A, Drukker D, Herr JL, et al. (2004) Implementing matching estimators for average treatment effects in Stata, *Stata journal*, 4, pp. 290-311
- Bahn, S., Barratt-Pugh, L., & Yap, G. (2012). The employment of skilled migrants on temporary 457 visas in Australia: Emerging issues. *Labour & Industry: a journal of the social and economic relations of work*, 22(4), 379-398
- Caliendo M and Kopeinig S (2008) Some practical guidance for the implementation of propensity score matching, *Journal of economic surveys*, 22(1), pp. 31-72
- Chiswick, B. R., & Miller, P. W. (2009). Earnings and occupational attainment among immigrants. *Industrial Relations*, 48(3), 454-465
- CIE (2013). *The economic impacts of migration*. Report prepared for NSW Trade and Investment, Regional Infrastructure and Services, The Centre for International Economics
- Campbell, I., & Tham, J. C. (2014). Labour market deregulation and temporary migrant labour schemes: An analysis of the 457 visa program, *Australian Journal of Labour Law* No. 26
- DIBP (nd) *Filling the gaps; Findings from the 2012 Survey of subclass 457 employers and employees*, Department of Immigration and Border Protection, Commonwealth of Australia, Canberra
- DIBP (2017) *Temporary Work (Skilled) visa (subclass 457)*, Department of Immigration and Border Protection <https://www.border.gov.au/Trav/Visa-1/457->
- DIBP (2017) Abolition and replacement of the 457 visa – Government reforms to employer sponsored skilled migration visas, Department of Immigration and Border Protection <https://www.border.gov.au/Trav/Work/457-abolition-replacement>
- Huber C (2015) *Introduction to treatment effects in Stata: Part 2*, Stata Press, <http://blog.stata.com/2015/08/24/introduction-to-treatment-effects-instata-part-2/>
- Gregory, R. (2014). *The two-step Australian immigration policy and its impact on immigrant employment outcomes* (IZA Discussion Paper No. 8061). Bonn: Germany
- Hansell, D. & Rafi, B. (2017) Firm-level Analysis using the ABS' Business Longitudinal Analysis Data Environment (BLADE), Data Survey, forthcoming in the *Australian Economic Review*
- Larsen, G. (2013). *The subclass 457 visa: a quick guide*. Parliamentary Library
- Miller, P. W., & Neo, L. M. (2003). Labour market flexibility and immigrant adjustment. *Economic Record*, 79(246), 336
- Parliament of Australia (1994) *Business Temporary Entry: Future Directions*, Committee of inquiry into the temporary entry of business people and highly skilled specialists (Roach Report), Parliament of Australia, Canberra
- Parham, D. & To, H. & Ratna, N. & Regan, S. & Grafton, Q. (1999). *Migration and Productivity in Australia*. Crawford School of Public Policy, Australian National University, Canberra

- Productivity Commission. (2006). *Economic impacts of migration and population growth*, Commonwealth of Australia, Canberra
- Productivity Commission. (2016). *Migrant intake into Australia*. Final Report, Commonwealth of Australia, Canberra
- Rafi, B. (2016) *The labour market outcomes of Indian male migrants in Australia*, Doctoral Thesis, University of Canberra
- Rafi, B. (2017) *Participation in South Australian Innovation and Investment Funds: Impact on firm performance*, Research Paper 1/2017, Office of the Chief Economist, Department of Industry, Innovation and Science, Canberra <https://industry.gov.au/Office-of-the-Chief-Economist/Research-Papers/Pages/The-impact-of-labour-market-regulation-on-the-unemployment-rate-Evidence-from-OECD-economies.aspx>
- Velayutham, S. (2013). Precarious experiences of Indians in Australia on 457 temporary work visas. *The Economic and Labour Relations Review*, 24(3), 340-361

