Factors underlying the likelihood of being in business for Indigenous and non-Indigenous Australians

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Abstract

A significant difference exists between the rates of Indigenous and non-Indigenous business ownership in Australia. This paper attempts to understand the factors that may affect the likelihood of Indigenous Australians being in business compared to non-Indigenous Australians. We use a probit cross-sectional estimation on a close to 5 per cent sample of the Australian population from the 2016 Census to assess the factors that are associated with a higher probability of being in business for four groups: Indigenous men and women and non-Indigenous men and women. The results show that once accounting for other socioeconomic and demographic factors, identifying as Aboriginal and/or Torres Strait Islander in the Census explains a sizeable difference between the rates of business ownership. The results suggest a discriminatory barrier may affect the likelihood of being in business for many entrepreneurial Indigenous Australians. The paper also looks at the correlation between business ownership and education, home ownership, access to networks, age, disability, marital status and geography.

JEL Codes: J15, J78, L26
Keywords: Indigenous business, entrepreneurs, social policy, labour economics

Introduction

Recent success in the Indigenous business sector is fuelling interest in the economic development benefits of business ownership for Indigenous Australians. Shirodkar, Hunter and Foley (2018) show that growing numbers of Indigenous Australians are choosing a life in business. The literature suggests that socioeconomic structural barriers may limit Indigenous business ownership compared to non-Indigenous Australians. The barriers include external and internal discrimination, lack of education and training, lack of access to finance (and home ownership), lack of access to networks and difficult geography (Daly 1993, Dana 1996, Thomas and Mueller 2000, Foley 2000, Altman 2001, Lindsay 2005, Costa and Kahn 2003, Foley 2006, Schaper 2007, Paradies et al. 2008, Dockery 2010, Wood and Davidson 2011, Booth et al. 2012, Hunter et al. 2014, Hunter 2014, Biddle et al. 2013) . This paper examines data from the 2016 Australian Census Longitudinal Dataset (ACLD) to develop a quantitative model that identifies the factors that impact on the likelihood of a person going into business. The primary determinant tested is the Indigenous status variable in the Census, i.e. that a person identifies as Aboriginal and/or Torres Strait Islander in the 2016 Census.

This paper finds that when accounting for socioeconomic conditions, a specific racial or identity factor comes into play for both women and men, significantly reducing the likelihood of an Indigenous Australian going into business compared to non-Indigenous Australians. Socioeconomic differences such as this may reflect the impact of an external discriminatory environment that inhibits Indigenous aspiration (Costa and Kahn 2003, Foley 2000, Foley 2006, Schaper 2007, Paradies et al 2008, Booth et al 2012, Hunter et al 2014, Hunter 2014, Biddle et al 2013). It could also reflect factors internal to Indigenous communities (Daly 1993, Thomas and Mueller 2000, Altman 2001, Lindsay 2005, Shaper 2007, Dockery 2010, Moore 2014, Dana 2015). The limitation of this quantitative study is that it cannot discern between the two theories. It can only indicate if identifying as Indigenous affects the rate of business ownership in Australia. But it provides a starting point to begin to understand the effects of societal constructs such as our operating environment, which can be discriminatory. The study also highlights other key factors behind Indigenous and non-Indigenous Australians going into business, including geography, education, marital status, socioeconomic backgrounds, income, home ownership, mobility and disability.

Policy context

Shirodkar, Hunter and Foley (2018) highlights the rapid growth of Indigenous Australians in business. The recent growth is partially attributable to the growing acceptance of Indigenous Australians in business and the impact of initiatives such as the Indigenous Procurement Policy (IPP). Since the inception of the IPP in 2015-16, the Commonwealth has awarded over $2 billion in procurement contracts to well over 1,000 Indigenous-owned businesses. Further evidence from the Commonwealth Government shows that Supply Nation-registered Indigenous businesses generated more than $1 billion in revenue in 2014-15, and growing at an annual average rate of

around 12.5 per cent per year. Studies have also acknowledged the sector's potential to significantly boost Indigenous employment and broader economic development outcomes, with Indigenous businesses anywhere between 40 times (Supply Nation's unpublished estimates) and up to 100 times (Hunter 2014) more likely to hire Indigenous employees than compared to non-Indigenous businesses.

Previous research has focused on the concept of an Indigenous business (Foley 2013) and much of the wider policy discussion is centred around the legal entity of a business. Supply Nation's database of Indigenous businesses, the largest in the country, only has around 1800 businesses registered (has at least 50 per cent Indigenous ownership) or certified (has at least 51 per cent Indigenous ownership). Census data suggests this is but a fraction of the size of the Indigenous business sector, as measured through the count on Indigenous Australians who identify as owner-managers of businesses. The absence of a complete and consistent database of Indigenous-owned businesses hampers detailed study of such entities. Instead, focusing on the individual owner-manager behind the legal entity opens up areas of exploration that would otherwise remain closed. Recent Census data has emerged that enables econometric analysis of the determinants behind an individual deciding to enter into business. Using cross-sectional 2016 data from the ACLD, this paper attempts to determine the factors that are associated with a higher likelihood of Indigenous and non-Indigenous Australians being owner-managers. The approach is consistent with the concept of an Indigenous Australian entrepreneur, which has also emerged in the literature (Foley, 2003; Shaper, 2007; Wood and Davidson; 2011; Hunter, 2014).

The concepts of an Indigenous entrepreneur and an Indigenous owner-manager are treated the same for the purposes of this study (i.e. the term owner-manager is used synonymously with entrepreneur). The only qualification is that an individual identifies as an owner-manager of an incorporated or unincorporated enterprise in the Census. As such, the tech-start up entrepreneur and the local sole-trading plumber are both examples of owner-managers of businesses in this research.

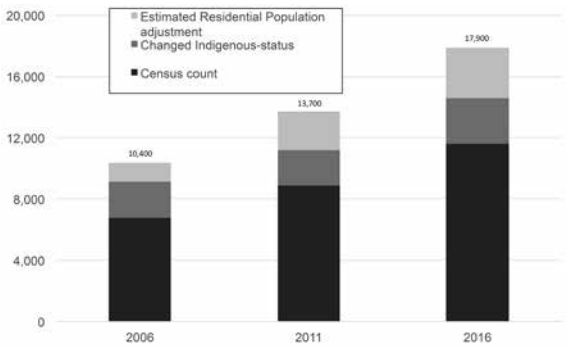
The historical exclusion of Indigenous Australians from mainstream economic life has led to a low accumulation of wealth across many Indigenous communities (Foley 2003, Booth et al 2012, Biddle et al 2013 and Hunter 2014). As such, only a relative few gained formal business experience prior to the last decade. The result is that the vast bulk of entrepreneurially inclined Indigenous Australians likely lack the key pre-conditions to start a business and prosper in our capitalist economy. In spite of the historically challenging environment, the number of Indigenous Australians in business has grown substantially over the last decade.

Hunter (2014) attempted to provide a broad-brush estimate of the growth in Indigenous self-employed, which he claims has been growing steadily since the 1991 Census, albeit from a low base. The major issue faced in earlier estimates of the Indigenous business sector is an element of confusion as to what constitutes self-employment, how it relates to businesses and methods of measurement. Recent Census data collects information on people who are owner-managers of enterprises.

Shirodkar, Hunter and Foley (2018) use the last three Censuses and the ACLD to develop a measure of the size of the Indigenous business sector. The estimates adjust for the increasing identification of Indigenous status between Censuses and inflating

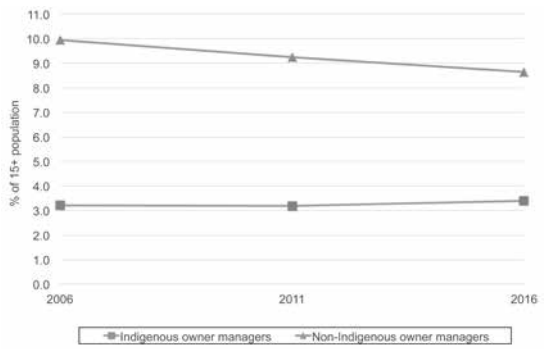
for the total Indigenous population, reflecting the difference between the Census count of the Indigenous population, which is around 18 per cent less than and the Indigenous estimated residential population for 2016. The paper demonstrates that the number of Indigenous owner managers has increased substantially, reaching between 17,000 to 18,000 owner-managers in 2016, growing by around 30 per cent from 2011 (see Chart 1). Despite this, the rate of Indigenous business ownership remains lower than the non-Indigenous rate (see Chart 2). Note though the Indigenous business sector grew during a time when the non-Indigenous business ownership rate stagnated and declined.

Chart 1: Growth in the number of Indigenous owner-managers in Australia, Census 2006-2016



Source: Shirodkar, Hunter and Foley (2018)

Chart 2: Rates of Indigenous and non-Indigenous business ownership, Censuses 2006–2016



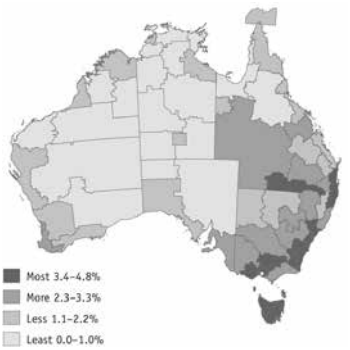
Source: Shirodkar, Hunter and Foley (2018)

Shirodkar, Hunter and Foley (2018) also show that men make up 67 per cent of Indigenous owner–managers and women 33 per cent, which is exactly the same gender split for non-Indigenous owner-managers. The uniform difference in rates of

business ownership between the genders may thereby reflect broader societal factors that inhibit all Australian women from going into business.

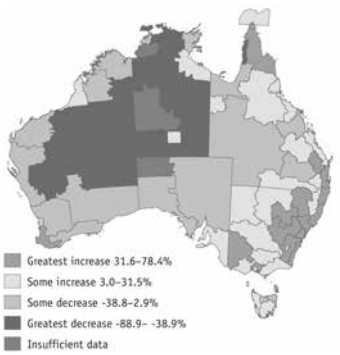
Map 1 shows that the highest proportions of Indigenous owner-managers in 2016 are concentrated in east coast urban areas where the labour and product markets are most developed, as well as regional parts of the eastern states of Queensland, New South Wales, Victoria and Tasmania. Indigenous owner-managers are more sparsely concentrated across the rest of the country and make up the lowest shares of the Indigenous population in large areas of remote Western Australia, Northern Territory and South Australia. Map 2 provides greater detail of the change in the number of Indigenous owner-managers between 2011 and 2016 across regions. While growth in the number of Indigenous owner-managers was relatively high in metropolitan areas, growth was weaker in areas where relatively few Indigenous owner-managers operated. The largest declines were in remote regions, generally from a relatively low base in 2011. The Northern Territory and very remote parts of Western Australian and the Northern Territory appear hardest hit. Overall, the change in the number of Indigenous owner managers reinforces the story that remote areas are underdeveloped in terms of access to markets. Clearly, the situation is becoming more challenging.

Map 1. Owner-managers (per cent 15-64), 2016



Source: Hunter B, Foley D and Arthur WS (2019)

Map 2. Growth in Indigenous Owner Managers (per cent change), 2011-16



Source: Hunter B, Foley D and Arthur WS (2019)

Literature review

Access to the Australian Census Longitudinal Dataset (ACLD) enables the exploration of critical questions around the drivers for Indigenous and non-Indigenous business ownership.

Chart 2 shows that a significant difference exists between the rate of Indigenous and non-Indigenous business ownership, albeit narrowing gradually. The purpose of this study is to determine quantitatively the factors that increase the likelihood of

business ownership for Indigenous and non-Indigenous men and women. The primary determinant tested is the impact of a person's Indigenous status (i.e. identifying as Aboriginal and/or Torres Strait Islander or non-Indigenous) on the likelihood of being in business, once accounting for other pertinent factors.

The literature on Australian Indigenous entrepreneurship is limited, with only a few authors whose extensive writing has formed the main body of work, all of which is qualitative (Foley 2000, 2003, 2013; Hunter 1999, 2014, 2015; Wood and Davidson 2011; Altman 2001; and Daly, 1993). To date, no published study has undertaken a quantitative approach to estimate the relative effects of various determinants on business ownership. Rather, qualitative research has identified broad themes that may have an impact on a person's reasons for going into business.

Using qualitative case study analysis, Foley (2000) identifies a number of socioeconomic factors that may affect a person's desire to enter into business and success when in business. The factors include education levels, industry experience and training (which he argues is closely linked to education), membership in industry associations (i.e. access to networks), having a business plan and initial financial capital. Foley is of the view that human capital is a key determinant of entry and success in business, in line with Theodore Schultz's first articulations of human capital theory in the 1960s. Dockery (2010), Schaper (2007), Dana (1996) and Daly (1993) also identify a lack of formal education and prior work experience as key barriers into business ownership for Indigenous peoples in Australia and overseas. Equipping people with greater amounts of human capital (in the form of education and training) increases capability and productivity, and thereby economic prospects, particularly in employment. Naturally, one would assume that higher levels of education and training would also translate into important factors for business ownership. Evidence from the US Census suggests that self-employed individuals have on average an extra year of schooling compared with wage and salary earners and that each extra year of schooling increased the probability of a person being self-employed by 0.8 per cent (Robinson and Sexton 1994). However, Robinson and Sexton (1994) do not necessarily identify the type of education (e.g. bachelors, post-graduate, certificate) that have the largest effect on the likelihood of going into business. Lazear (2004) puts forward an alternative view, arguing that entrepreneurs need to be multiskilled or have a 'balanced' range of skills. He argues that they can be characterised as 'jacks-of-all-trades', and thereby not necessarily be an expert in any single skill. Lechmann and Schnabel (2011) develop a testable proposition based on Lazear's assumption, using German data to observe if entrepreneurs display alternative human capital investment patterns to the employed, which they find only limited evidence to support. Lechmann and Schnabel argue that self-employed individuals not only need more basic but also more expert skills than employees.

Limited human capital cannot wholly explain the difference in rates of business ownership between Indigenous and non-Indigenous Australians. For instance, the US Department of Labor in the early 1990s articulated the concept of a 'glass ceiling' for women and minorities in American workplaces as "artificial barriers based on attitudinal or organizational bias that prevent qualified individuals from advancing upward in their organization into management-level positions." (Department of Labor

1991: 1). One must also ask the question, do such artificial barriers also affect the likelihood of an Indigenous Australian going into business?

Kenneth Arrow's work on the economics of discrimination provides some guidance around the effects of artificial barriers. Arrow (1998) argues that contrary to the low entry cost principle underpinning well-functioning markets, the nexus between one's social life and their life as a market participant may, in fact, reinforce and reward racially exclusive networks. He suggests that maintaining racially exclusive networks helps create social capital amongst the inside group. The insiders reap the benefits of that *social capital* by maintaining high barriers against outside competition. The market and non-market benefits of exclusively trading with insiders (e.g. accessing the local country club, finding a spouse amongst people of a similar background, exclusive access to market information and exploitable opportunities) can more than offset the higher costs of transacting exclusively with insider group peers. With social capital, "discrimination no longer has a cost to the discriminator; indeed, it has social rewards" (Arrow 1998: 98), thereby radically altering resource allocation decisions from an open market alternative.

Arrow's model is akin to a class barrier, separating different groups based on socioeconomic, cultural, ethnic and/or racial lines. In the Australian context, the resulting market failure could be reducing competition (potentially significantly in remote Australia where Indigenous Australians make up around 30 per cent of the population), thereby artificially increasing prices and ultimately reducing the prospects for Indigenous economic development. It also means that access to networks and successful mentors and role models is retained within the confines of the non-Indigenous *in-group*. Foley (2000), Schaper (2007), and Wood and Davidson (2011) argue that access to mentors and role models is essential to Indigenous business ownership. Foley argues the "socio-economic environment that Indigenous Australia has been forced into has not allowed these associations to exist in any great number." (Foley 2000: 14). The Socio Economic Index for Australia (SEIFA) provides an approximate indicator of access to networks, based on the socioeconomic status of the region in which the person resides (Edwards 2005). SEIFA uses the Index of Relative Socio-Economic Advantage and Disadvantage (IRSAD), which measures in deciles the most advantaged to most disadvantaged communities in Australia. As Arrow (1998) argues, the social capital residing within the in-group provides access to advantages and social rewards. One could therefore expect that living in more affluent areas, as measured through SEIFA, enables better access to networks and local demand for goods and services. Certain characteristics of a person or a family environment may also correlate higher rates of business ownership with the networks they may offer. Marriage can expand the number of networks that are available to an owner-manager. For instance, Wong (1986) finds a correlation between marriage and business success, showing that a spouse's education can significantly increase a partner's productivity within business families. Further, providing for one's family is a key motivator for starting a business (Foley, 2000). Foley suggests that having a family may push some into *necessity entrepreneurship.* Another possible indicator for *access to networks* is whether an individual lives in a 'mixed' household where both Indigenous and non-Indigenous people reside.

Foley (2000) writes about the two-fold impact of racism on the Indigenous Australian entrepreneur, "It is predominantly directed from the non-Indigenous population, and secondly, it is experienced to a lesser degree from within the Indigenous Australian community." (2000: 51). Discrimination from external sources can reflect *interpersonal* and *systemic* discrimination while that experienced within Indigenous communities could be characterised as *internal* discrimination (Paradies et al. 2008). However, the relative effects of each aspect of discrimination can become difficult to disentangle without some characteristic for differentiating the external and internal bias that may affect Indigenous people.

Schaper (2007) also contends that a lack of Indigenous entrepreneurs results from the historical exclusion of Indigenous Australians from the mainstream economy. Schaper also goes on to identify other factors including geography; a lack of successful role models; paucity of human capital such as education, skills development and training and a lack of access of finance, partially reflective of land titling issues and cultural differences. While most of Schaper's identified factors are discrete and can be paired with variables in the Census, land-titling is multifaceted and difficult to bifurcate. As such, we do not include this variable in the paper, however, we do include a variable associated with home ownership, which is described below.

Ord and Mazzarol (2007) identify three primary structural barriers to greater Indigenous employment and economic participation including (i) lack of education qualifications and skills development; (ii) poor employment opportunities within Indigenous communities; and (iii) marginalisation and exclusion from mainstream society. Poor employment opportunities likely has an effect on local demand, which can limit business opportunities for entrepreneurially inclined Indigenous Australians.

Wood and Davidson (2011) provide a literature review of the existing research summarising a range of factors that impact on Indigenous business ownership. These include discrimination and prejudice (based on race and gender); alienation from their own community; lack of formal education and prior work experience; clash of cultural value sets; lack of Indigenous role models and mentors; language barriers; lack of access to finance; and exclusion from networks.

Limited access to finance is a common theme identified as a key barrier to Indigenous entrepreneurship in the various sources above. The broader international literature relates a lack of access to finance, and thereby limited collateral, to limited home ownership (Schmalz, Sraer and Thesmar 2013; Fairlie 2013). Analysis of the 2016 Census shows that the Indigenous home ownership rate is less than half the rate of non-Indigenous home ownership, and thereby likely to reduce access to the collateral channel for bank loans. As a home ownership variable is available in the Census, we will test the significance and the size of the effect on the rate of business ownership.

Geographic barriers (which Shaper 2007 identifies) could also present detrimental factors against business formation. One could make the claim that the greater transactions costs associated with operating in remote and regional Australia may reduce the likelihood of a person going into business. If that were the case, then we would expect to see reduced rates of business ownership for Indigenous and non-Indigenous Australians in remote Australia compared to urban and regional settings.

In addition, Wright (2011) identifies that some entrepreneurs display high

levels of geographic mobility, i.e. the willingness to move to opportunities within regions and across countries. An example is the archetypal immigrant entrepreneur or a returning entrepreneur from overseas. The Census contains a variable asking if a person has moved in the last 5 years, which we include in our estimation. Note, however, that Wright also identifies a certain class of entrepreneurs who display low geographic mobility, which implies this variable may be a weakly significant if not an insignificant determinant of business ownership.

In addition, the high rates of disability in the Indigenous community (Hunter, Gray and Crawford, 2016) can also hamper opportunities to start a business. Recent evidence from South Africa shows that having a disability can impact on a person's ability to start a business given a "lack of equipment and machinery, discrimination, business networking, hardships in obtaining start-up capital, knowledge of support centres for entrepreneurs living with physical disabilities, and lack of education and training." (Maziriri, Madinga and Lose 2017: 27).

Age could also affect the likelihood of a person being in business as a diversity of experiences is potentially associated with successful entrepreneurship (Lazear 2004). Indigenous Australians in business are generally a younger cohort than non-Indigenous counterparts (Shirodkar, Hunter and Foley 2018), which is consistent with the younger demographic in the Indigenous population. The median age for Indigenous owner-managers is around 40-44 years, and 44-49 years for non-Indigenous owner-managers. Further, Indigenous people may accumulate workforce experiences at a lower rate to the rest of the population because of historical exclusion from the labour market (Hunter et al. 2014). Such constraints on labour market participation could in turn affect the ability of Indigenous people to successfully conduct a business by limiting the number of valuable experiences and hence reduce the prevalence of owner-managers relative to the rest of the population.

While some of the literature pointed to English language skills as a barrier (Wood and Davidson 2011; Dockery 2010), interrogation of the ACLD found that the 'quality of spoken English at home' question was not a useful indicator for the purposes of determining the likelihood of becoming an owner-manager. That is because of the design of the Census, which only asked participants to answer the quality of spoken English question if English was not a participant's first language. Inadvertently, the exercise shows the vast majority of Indigenous Australians identified English as their first language in 2016, and thereby presumably did not face barriers associated with English language skills.

Methodology

The aim of the paper is to develop a probit model that determines the likelihood of a person being in business based on a range of socioeconomic and demographic indicators as identified in the literature and associated with variables found in the Australian Census Longitudinal Dataset (briefly described below). The primary variable being investigated is Indigenous status, and if identifying as Indigenous materially impacts the likelihood of being a business owner-manager once other relevant socioeconomic and demographic factors are identified.

Data

The ABS's ACLD provides an opportunity to analyse the characteristics of owner-managers (including household level information and regional information). The 2016 ACLD takes a slightly less than 5 per cent sample of Census records and links them across the 2011 and 2016 Censuses. The ACLD includes 14,000 Indigenous records forming one of the largest available datasets of Indigenous Australians (ABS 2013).[1]

Probit model

In order to provide a preliminary analysis that summarises the multivariate relationships we use a binary regression model to predict the marginal effect of various explanatory factors on the probability of being an owner-manager (between 0 and 1). A linear regression model (i.e., the linear probability model estimated using OLS) could be used but that is associated with heteroscedastic error variances. A probit regression specification can address the issue of heteroscedasticity and ensure that the errors are normally distributed. The probit model is easiest to think about in terms of a latent variable, Y^*:

$$\begin{aligned} Y^*_i &= \beta X_i + \varepsilon_i, \varepsilon_i \sim \mathrm{N}(0,1) \\ &\text{If } Y^*_i \geq 0, \mathrm{Y}_i = 1 \\ &\text{If } Y^*_i < 0, \mathrm{Y}_i = 0 \end{aligned} \tag{1}$$

Where:

- Y^*_i can be viewed as an indicator for whether this latent variable is positive
- Y_i is the dependent variable and takes on a value of 0 or 1. If a person is an observed owner-manager in 2016 it takes a value of 1.
- X_i is the matrix of independent variables that impact on the likelihood of becoming an owner-manager in 2016.

The model can estimate the probability (between 0 and 1) of being an owner-manager of an enterprise. The inverse probit transformation (i.e. standard normal cumulative distribution function) can predict the probability:

$$\hat{P}[Y_i = 1] = \Phi(\mathrm{X}_i, \cdot\hat{\beta}) \tag{2}$$

The coefficients of a probit model are difficult to interpret. As such, the paper reports the marginal effect of various explanatory factors on the probability of being an owner-manager. One can interpret the marginal effects for continuous variables as the change in probability associated with a change from the average (for income, it is the impact of a $1000 increase in weekly income; for SEIFA, it is the impact of a decile increase). For dummy variables, the change in probability is measured as a one-unit

1 The first iteration of the ACLD linked 2006 Census records to 2011 records, of which, around 14,802 were people who identified as Indigenous in 2006. Due to attrition in the sample, resulting from death and other factors, we guess that around 14,000 in the 2011-2016 sample identify as Indigenous.

change from the omitted category.

The explanatory variables are contemporaneous with the dependent variable and measured for 2016. As this is a cross-sectional analysis, we cannot associate causality between right-hand side variables and business ownership, merely correlation. As further iterations of the ACLD become available, researchers will have access to a longer timeseries of data necessary to make best use of the longitudinal aspects of the ACLD.

This paper's aim is primarily on the issue of Indigenous identity and its correlation with business ownership. It is not the central aim to explore the differences between the rates of male and female business ownership in detail. But given the uniformly lower rates of business ownership for women – exactly half the rate of men in both Indigenous and non-Indigenous populations – it is important to specify four separate probit estimations: Indigenous men, Indigenous women, non-Indigenous men and non-Indigenous women. The results provide some insights into the different factors associated with female and male business ownership in Australia.

Choice of variables

Based on the brief literature review above, a summary of the factors that affect Indigenous business ownership include human capital in the form of education; access to economic and financial assets; discrimination (external and internal); access to networks (living in high socioeconomic regions, living in mixed heritage households and marital status); geography; mobility; disability and age. Each of these elements is associated with a variable in the 2016 Census, as described in Table 1 and reported in the first column. The second column reports the most suitable variables in the ACLD associated with each. The third column indicates whether this census data is available as a *dummy* variable (i.e. taking the values of 0 or 1) or can be characterised as *continuous* data.

Most of the associations between the factor and the choice of variable are straightforward. Qualifying notes in relation to some variables are below.

- In this study, only one variable can relate back to the issue of discrimination – identifying as Aboriginal and/or Torres Strait Islander or non-Indigenous in the Census – and that variable cannot distinguish the effects of internal and external discrimination.
- The age variable is captured as a series of dummies for broad age groups to allow for non-linearity without imposing a particular functional form (e.g., a quadratic in age).
- The home ownership variable measures whether an individual owns a dwelling outright and offers a proxy for access to capital, on the basis that one's home often forms the collateral necessary for borrowing. The other proxy for access to capital is the equivalised household income, which adjusts household income using the modified Organisation for Economic Cooperation and Development (OECD) equivalence scales for analysis of financial stress (Breunig, Hasan and Hunter, 2019). The paper assumes that a higher level of income is associated with greater wealth, and therefore, offering an easier channel to access capital.

Table 1: The Census-based determinants of owner-managers in Australia and variables

Determinants	*Proxy variable in census data*	*Type of variable*
Human capital (formal education and prior work experience)	Level of education 2016	Dummy
Access to economic and financial assets	Home ownership 2016	Dummy
	Equivalised household Income 2016	Continuous
Discrimination (internal and external)	Indigenous status 2016	Dummy
	Gender 2016	Dummy
Access to networks (including role models, mentors)	Equalised household income 2016	Continuous
	Mixed heritage relationship 2016	Dummy
	SEIFA 2016	Continuous
Geographic location/remoteness status	Urban 2016	Omitted
	Regional 2016	Dummy
	Remote 2016	Dummy
Internet connection	Access to internet in household 2016	Dummy
Mobility	Previously moved within the last 5 years 2016	Dummy
Person with a disability	Disabled 2016	Dummy
Marital status	Marital status 2016	Dummy
Age	Age 15-34 2016	Omitted
	Age 35-44 2016	Dummy
	Age 45-54 2016	Dummy
	Age 55-64 2016	Dummy
	Age 65 and over 2016	Dummy
Local demand for goods and services	SEIFA 2016	Continuous

The omitted categories for the dummy variables are: a person identifies as non-Indigenous (for the models described in Appendix Table A2); a male (for the models described in Appendix Table A2); living in a major urban area; did not reside in a 'mixed' household; was single; aged 15 to 34 years in 2016; did not obtain a year 11/12 or post-school qualification; did not have a disability; did not own a home; and the respondent did not change address in the 5 years to 2016. Interpret the results as the difference in the rate of being in business compared to the omitted category reference group.

Table 2 reports the results based on Indigenous status and gender. Appendix Table A1 reports the descriptive statistics for the identified variables.

Results

Appendix Table A2 reports the regression modelling using the full selection of indicators. The table also reports a parsimonious version that removes SEIFA and mobility data as their inclusion omits between 5-9 per cent of the sample. We also leave out household income in the parsimonious model, which may be endogenous to the owner-manager dependent variable.

The preliminary analysis in Appendix Table A2 provides a robustness check of the final specification reported in Table 2 and in the text below. Note that no significant differences in marginal effects emerge as a result of using a full model compared to a more parsimonious specification. We report the results for the full model in the following discussion.

Table 2 below and Appendix Table A2 report the marginal effects for our defined explanatory factors. Note that the concordance statistic (or c-statistic) is a summary of the trade-off for the model between identifying true positives and false positives (model predicting an owner manager or other people to be an owner-manager). C-statistics with values over 0.7 is evidence that the model is adequate or even a good model, whereas values over 0.8 indicate a strong model (Hosmer and Lemeshow 2000: 162). According to this criteria the goodness of fit for all the reported models are adequate.

Table 2. Marginal effects of being an owner-manager by gender and Indigenous status, aged 20-64 years, 2016

	Females		*Males*	
	Indigenous only	*Non-Indigenous only*	*Indigenous only*	*Non-Indigenous only*
Mixed household	0.008**	-0.016***	0.013**	-0.03***
Married	0.017***	0.033***	0.015**	0.076***
Age 35 to 44 years	0.014**	0.041***	0.036***	0.070***
Age 45 to 54 years	0.009	0.047***	0.049***	0.089***
Age 55 to 64 years	0.003	0.030***	0.036**	0.074***
Highest qualification is Degree	-0.00004	0.005***	-0.00006	-0.008***
Highest qualification is Diploma	0.016**	0.020***	0.011	0.005
Highest qualification is Certificate	0.011*	0.020***	0.041***	0.073***
Highest qualification is Year 11 or 12	0.004	0.004**	-0.017**	-0.0002
Person with a disability	-0.014***	-0.048***	-0.033***	-0.122***
Lives in regional area	0.003	0.029***	-0.0008	0.033***
Lives in remote area	0.0009	0.062***	-0.007	0.059***
Own home	0.015***	0.014***	0.025***	0.030***
Mobility in previous 5 years	0.004	-0.004***	0.002	-0.006***
Equivalised household income§	0.02	0.50***	0.01	0.24***
Deciles of SES of local area§	0.003***	0.006***	0.007***	0.013***
Pseudo R^2	0.115	0.0476	0.117	0.064
Probability of reference person	0.018	0.066	0.043	0.145
Concordance statistic	0.778	0.662	0.765	0.679
Number of observations	5,619	253,546	4,613	234,683

Notes: *** denotes significance at the 1 per cent level. ** denotes significance at the 5 per cent level. * denotes significance at the 10 per cent level. No star denotes insignificance at the 10 per cent level. Marginal effects of dummy variable are the change in probability of being an owner-manager associated with a change in the variable from 0 to 1, while marginal effects for continuous variables (denoted with a §) are reported as the change in probability associated with a one unit increase of the respective explanatory factor. In the case of Equivalised household income, the value presented in the table above reflects the percentage point increase in the likelihood of being an owner-manager associated with a $1000 increase in equalised household weekly income. For the Deciles of SES of the local area, the coefficient explains the impact on the likelihood of going into business associated with a 1 decile increase in the SEIFA index. The reference person is defined by the omitted category (i.e., setting the dummies to zero) and assuming continuous data is set to the sample average.

Indigenous status

All else being equal, identifying as Indigenous in 2016 is associated with a sizeable 4-5 percentage point lower likelihood of being an owner-manager compared to the baseline non-Indigenous person (Appendix A2). Note that the difference in the rates

of business ownership between Indigenous and non-Indigenous Australians (15 years and over) was around 6 percentage points (chart 2). Clearly, while controlling for other observable characteristics is associated with some reduction in the raw gap between the rates of business ownership, identifying as Indigenous remains a substantial explanatory factor behind whether or not a person is an owner-manager. The result confirms that racial and/or identity-related factors are associated with a lower likelihood of Indigenous Australians being in business. It means policy makers cannot ignore the possible effects of a discriminatory operating environment in Australia on Indigenous business growth.

Table 2 reports regression results separately for Indigenous and non-Indigenous females and males. Systematic differences in the explanatory factors for the two populations exist. In general, the marginal effects for the Indigenous population (male and female) are lower than for the non-Indigenous population (male and female). It accords with the finding that Indigenous Australians are around 4-5 percentage points less likely to be owner-managers than non-Indigenous people. Also, marginal effects associated with women are generally smaller than that of men amongst both the Indigenous and non-Indigenous groups. The results are unsurprising given that women make up almost exactly one-third of owner-managers amongst both Indigenous and non-Indigenous Australians.

Age

A person aged between 45 and 54 was generally more likely to be in business in 2016 than in any other age cohort. The exception are Indigenous women, who were marginally more likely to be in business if aged between 35 to 44 years.

Education

At odds with much of the literature around the importance of human capital for entrepreneurship, having 'higher' levels of human capital is not necessarily associated with an increased probability of being an owner-manager. Indeed, having a Certificate level qualification was associated with the largest increase in the likelihood of being in business for Indigenous men (4.1 percentage point increase) compared to their base case. And non-Indigenous men who had a Certificate qualification were 7.3 percentage points more likely to be in business compared to their base case. For Indigenous women, having a diploma was associated with higher rates of business ownership while for non-Indigenous women, having either a diploma or Certificate were equally associated with a 2 percentage point higher likelihood of being in business. In contrast having a degree was not associated with a higher likelihood of an Indigenous person being in business, and for non-Indigenous people, having a degree only increased the likelihood of business ownership by less than 1 percent compared to the base case. The results are more in keeping with Lazear's (2004) view of entrepreneurs being jacks-of-all-trades, showing that many owner-managers do not necessarily need a 'high-level' qualification such as a degree to go into business. Rather, a practical qualification – such as a Certificate or Diploma, may deliver skills that are more appropriate for business ownership.

Geography

For non-Indigenous people, living in a remote or regional area was associated with a statistically higher probability of being an owner-manager. But the chance of a remote or regionally-based Indigenous Australian being in business were not significantly different to the chances of an urban-based Indigenous Australian being in business. The result implies that non-Indigenous hands may control much of the economic and viable business opportunities in regional and remote Australia. This is despite Indigenous people making up around 30 per cent of the remote population, and having a claim to over 40 per cent of the Australian landmass, much of it in regional and remote Australia, through Native Title and other Indigenous land rights regimes.

Home ownership

Owning one's home statistically significantly increased the likelihood of going into business across all four groups in 2016 by around 1½ percentage points for women and around 2½-3 percentage points for men. The interpretation of this result is important. Given that home ownership only increases the likelihood of business ownership by a relatively small margin, it implies that having this financial asset is not a necessary but perhaps a sufficient pre-condition for starting a business. Further research is required to investigate the importance of home ownership and its link to business ownership in Australia.

Incomes, socioeconomic status, marriage and access to networks

The coefficients for household equalised incomes are very small and are not statistically significant for Indigenous Australians. The coefficients for non-Indigenous men and women are very small positives but statistically significant. One can interpret the results in the following way. Every $1000 weekly increase in income is associated with a 0.5 percentage point increase in the probability of being in business for non-Indigenous women and a 0.24 percentage point increase for non-Indigenous men. Note that reverse causation may also be in effect, meaning higher rates of business ownership could lead to higher incomes.

A one-decile increase in socioeconomic status under SEIFA is associated with a 0.3 percentage point increase in business ownership for Indigenous women, a 0.6 percentage point increase for non-Indigenous women and a 0.7 percentage point increase for Indigenous men. But the largest effect was for non-Indigenous men, for whom a one decile increase in the SEIFA index is associated with a 1.3 percentage point increase in business ownership. For example, a non-Indigenous man from Seven Hills/Toongabbie (6th decile) is on average 1.3 percentage points more likely to be an owner-manager than a non-Indigenous man in the nearby suburb of Kings Park in Blacktown (5th decile). The results imply that while all groups can benefit from greater access to higher socioeconomic status environments, non-Indigenous men are arguably better able to leverage social capital from their immediate vicinity. Note that on average, Indigenous men and women are in the 4th decile for socioeconomic advantage, while non-Indigenous men and women are on average in the 6th decile.

Married people were more likely to be in business across all four groups,

but in particular for non-Indigenous men, where marriage was associated with a 7.6 percentage point increase in the rate of business ownership. Being in a mixed household was associated with a slightly higher rate of business ownership for Indigenous men and women. But being in a mixed household was associated with a statistically lower likelihood of business ownership for non-Indigenous men and women. It implies that Indigenous people who marry non-Indigenous partners may have access to a larger pool of economic options, thereby increasing their likelihood of owning a business.

Disability

Having a disability was a major inhibitor to business ownership for all groups. But the impact was most pronounced for non-Indigenous men, for whom having a disability was associated with a 12.2 percentage point decrease in business ownership.

Mobility

Mobility in the previous five years to the 2016 Census is generally not an important determinant of business ownership for any group identified in Table 2. We note that for non-Indigenous Australians, mobility in the last five years had a small and negative but statistically significant correlation with business ownership (less than 1 percentage point reduction). It implies that if a non-Indigenous person is to go into business, they may look for opportunities locally while for Indigenous people, moving locations was not associated with a higher or lower likelihood of being in business. The small size of the coefficients attached to this variable in each equation could reflect Wright's (2011) observation that mobility was an ambiguous indicator of business ownership.

Further observations

Overall, the marginal effects for Indigenous men and women are significantly lower than for non-Indigenous Australians. For example, the returns to higher education in terms of ability to own and manage a business are significantly lower for Indigenous men and women compared to non-Indigenous men and women. The lower marginal effects for Indigenous people could reflect their historical and ongoing exclusion from aspects of Australian society, and as a by-product, exclusion from business and economic opportunities. In future analysis we anticipate conducting a decomposition of the non-linear (probit) model of Indigenous and non-Indigenous owner-managers following the method articulated in Bauer and Sinning (2008). Such techniques allow claims to be made about the explained and unexplained components of the gap between average prevalence of owner-managers for Indigenous and non-Indigenous males and females. The unexplained component may correlate with discrimination (internal or external) whilst the explained component is associated with differences in initial endowments, which could also reflect the long-term effects of a discriminatory environment facing Indigenous Australians.

Conclusions

This paper seeks to redress the limited understanding of the factors that drive Indigenous business vis-à-vis other Australian businesses. The relatively low rates of Indigenous

business ownership suggest structural social and economic barriers exist that are limiting a large proportion of Indigenous Australians from entering into business.

The size and significance of the 'Indigenous status' indicator implies a racial identity related effect is reducing the likelihood of an Indigenous person being an owner-manager of a business, all other things being equal (see Appendix Table A2). However, as stated previously, the data does not imply if the effect is associated with external systemic discrimination or factors internal to the Indigenous community. But some other Australian research provides guidance as to the likely cause. For instance, Booth et al. (2012) show Anglo-Saxon names had a 35 per cent higher chance of receiving a call back for an interview compared to job applicants with an 'Indigenous-sounding' name. This provides evidence of discriminatory behaviour from employers. Further, Biddle et al. (2013) suggest that to avoid potential discrimination some Indigenous Australians may decrease their labour supply. This, at times, is referred to as the adjustment effect of discrimination on labour supply.[2]

The above examples illustrate that discriminatory labour market conditions exist for Indigenous Australians. It is not a significant leap to think that those conditions extend to Indigenous entrepreneurs or Indigenous people seeking to enter into business. Indigenous owner-managers may suffer discrimination from suppliers, from customers and from potential lenders; any of which could adversely affect the prospect of starting a business or impede the ongoing likelihood of success. The findings warrant further investigation around the economic impacts of discrimination. A comparison study of recently immigrated persons and Indigenous Australians could shed further light on the challenges Indigenous entrepreneurs face, but is speculative and beyond the scope of this paper.

In addition to Indigenous status, the probit results pose interesting findings about the differing factors associated with business ownership based on gender, but is only reported on and not fully analysed in this paper. For example having a higher income and higher socioeconomic status as measured through SEIFA was associated with higher rates of business ownership across all groups, but non-Indigenous men benefited at double the rate, implying that an 'old-boys network' may limit opportunities for perceived outsiders. Future research should further explore the differences based on gender.

Interestingly, having very high levels of education was not necessarily an important determinant of business ownership. Indeed, it seems having a Certificate level qualification is more than sufficient to enter into business, particularly for non-Indigenous men but also for Indigenous men.

Finally, and at odds with conventional wisdom, living in a remote area increased the likelihood of a non-Indigenous men and women owning a business in 2016. But remote-based Indigenous men and women were statistically no more or less likely to be in business compared to their urban counterparts once other factors were

2 Alternatively, Goldsmith et al. (2004) identify a resume effect, whereby an individual who anticipates discrimination, increases their labour supply to demonstrate a higher level of productivity for relatively low paying work. The resume effect is an attempt to restore psychological balance from a state of imbalance that arise from experiences in the labour market and the expectation of employer discrimination (i.e., avoid cognitive dissonance).

considered. It implies that, despite Indigenous Australians have at least some say over more than 40 per cent of the Australian continent (through Land Rights and Native Title laws, much of it in remote Australia) control of *bankable* economic opportunities in remote areas remain largely in non Indigenous hands. Further work is required to improve prospects for Indigenous Australians in remote areas to leverage their economic assets.

As the study is cross-sectional, we can only prove correlation – not causation. Nevertheless, these findings should encourage policy makers to think beyond just enhancing the capabilities of Indigenous Australians through education and training, which has previously been a primary focus of Indigenous economic policy across Australian Governments. Governments should consider the impact of a biased operating environment that Indigenous Australians may face when attempting to access economic and business opportunities in mainstream Australian society. Policies such as the Indigenous Procurement Policy have the potential to reshape and open up the business and economic operating environment for Indigenous Australians when implemented effectively.

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Appendix Table A1. Summary statistics for regressions by gender

	Females				*Males*			
	Indigenous only		*Non-Indigenous only*		*Indigenous only*		*Non-Indigenous only*	
	Mean	*Standard deviation*	*Mean*	*Standard deviation*	*Mean*	*Standard deviation*	*Mean*	*Standard deviation*
Owner-manager	0.027	0.162	0.075	0.263	0.055	0.228	0.159	0.365
Mixed household	0.413	0.492	0.015	0.121	0.480	0.500	0.013	0.113
Married	0.456	0.498	0.702	0.457	0.431	0.495	0.648	0.478
Age 35 to 44 years	0.226	0.418	0.231	0.422	0.216	0.412	0.224	0.417
Age 45 to 54 years	0.226	0.418	0.252	0.434	0.200	0.400	0.245	0.430
Age 55 to 60 years	0.156	0.362	0.231	0.421	0.152	0.359	0.228	0.419
Highest qualification is degree	0.111	0.314	0.321	0.467	0.070	0.256	0.258	0.437
Highest qualification is diploma	0.105	0.306	0.134	0.341	0.056	0.229	0.098	0.297
Highest qualification is Certificate	0.206	0.405	0.139	0.346	0.280	0.449	0.282	0.450
Highest qualification is Year 11/12	0.165	0.371	0.187	0.390	0.167	0.373	0.178	0.383
Person with a disability	0.063	0.243	0.033	0.178	0.074	0.262	0.033	0.179
Lives in regional area in 2016	0.438	0.496	0.260	0.438	0.415	0.493	0.258	0.437
Lives in remote area in 2016	0.185	0.388	0.013	0.115	0.184	0.387	0.015	0.123
Own home	0.354	0.478	0.709	0.454	0.396	0.489	0.704	0.456
Individual mobile in last 5 years	0.503	0.500	0.455	0.498	0.465	0.499	0.456	0.498
Equivalised household income[§]	1,595	1,214	2,237	1,509	1,798	1,295	2,379	1,520
SEIFA of local area deciles in 2016[§]	3.334	2.509	5.673	2.826	3.592	2.634	5.683	2.821
Number of observations	6,978		283,016		5,933		265,244	

Notes: See note for Table 2.

Appendix Table A2. Marginal effects of probability of being an owner manager, ACLD 2011-16, all aged 20-64, 2016

	All ACLD		*Indigenous only*		*Non-Indigenous only*	
	Full	*Parsimonious*	*Full*	*Parsimonious*	*Full*	*Parsimonious*
Indigenous person	-0.042***	-0.048***				
Mixed household	-0.010***	-0.012***	0.010**	0.014***	-0.022***	-0.028***
Female	-0.077***	-0.077***	-0.022***	-0.022***	-0.078***	-0.078***
Married	0.051***	0.053***	0.016***	0.018***	0.052***	0.054***
Age 35 to 44 years	0.054***	0.057***	0.024***	0.025***	0.055***	0.058***
Age 45 to 54 years	0.066***	0.072***	0.025***	0.025***	0.067***	0.074***
Age 55 to 64 years	0.050***	0.053***	0.016**	0.016**	0.050***	0.054***
Highest qualification is degree	0.002	0.026***	-0.0002	0.011*	0.002	0.026***
Highest qualification is diploma	0.016***	0.031***	0.016**	0.026***	0.016***	0.031***
Highest qualification is Certificate	0.051***	0.058***	0.024***	0.030***	0.051***	0.058***
Highest qualification is Year 11 or 12	0.003**	0.014***	-0.004	-0.004	0.003**	0.014***
Person with a disability	-0.078***	-0.082***	-0.022***	-0.022***	-0.080***	-0.083***
Lives in regional area	0.030***	0.011***	0.002	-0.004	0.031***	0.011***
Lives in remote area	0.051***	0.026***	0.002	-0.012***	0.060***	0.034***
Own home	0.021***	0.030***	0.019***	0.020***	0.021***	0.030***
Individual mobile in previous 5 years	-0.005***		0.003		-0.005***	
Equivalised household income	0.039***		0.000		0.040***	
SEIFA of local area deciles	0.009***		0.005***		0.009***	
Pseudo R^2	0.082	0.072	0.127	0.113	0.080	0.071
Baseline P(OM)	0.096	0.097	0.028	0.028	0.098	0.099
Concordance statistic	0.710	0.698	0.782	0.771	0.708	0.6954
Number of observations	498,461	533,972	10,232	11,529	488,229	522,443

Notes: See note for Table 2.