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RESEARCH REPORT

NCVER

Making ‘good’ choices: the impact of entitlement models on upskilling later in life

Cain Polidano
Justin van de Ven
Sarah Voitchovsky

Melbourne Institute of Applied Economic and Social Research



INFORMING POLICY AND PRACTICE
IN AUSTRALIA’S TRAINING SYSTEM

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Level 11, 33 King William Street, Adelaide, SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

Phone +61 8 8230 8400 **Fax** +61 8 8212 3436
Email ncver@ncver.edu.au **Web** <https://www.ncver.edu.au> <http://www.lsay.edu.au>
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About the research

Making 'good' choices: the impact of entitlement models on upskilling later in life

Cain Polidano, Justin van de Ven and Sarah Voitchovsky, Melbourne Institute of Applied Economic and Social Research

In 2008, the Council of Australian Governments (COAG) initiated the National Agreement for Skills and Workforce Development, a component of which focused on reforming the training market to be more learner-driven and responsive to the labour market. This resulted in the implementation of national training entitlements for government-subsidised training places. An underlying premise of entitlement models is that, by giving the student a choice in where they train and the capacity to choose their course, they will more likely choose courses that will benefit them economically and, therefore, the wider labour market.

This research looks at the responsiveness of individuals — aged 25 to 54 — to government subsidies designed to support upskilling through the Victorian Training Guarantee (VTG). The timeframe for analysis was 1 Jan 2011 — 30 June 2012, reflecting the first 18 months that the reforms introduced through the VTG were fully implemented for the target age band. This timeframe is also prior to the reforms introduced in July 2012 that focussed on targeting subsidies to influence course choices, and the introduction of Skills First on 1 January 2017, which superseded the Victorian training and TAFE system. Therefore, while this research does not consider reforms post July 2012, the findings are still relevant in the current environment as the criteria for 'older' learners remains unchanged, namely government-subsidised training places available to individuals aged 20 years or older that are looking to upskill.

This research builds on that supported previously by NCVER, which explored the early impacts of the VTG on enrolment numbers and graduate outcomes among 15 to 19-year-olds (Leung et al. 2014).A particular focus here is on the impact of the subsidies on enrolments, as well as the alignment of course choices with labour market needs. The research explored how enrolment and course choice responses varied by age, gender and across disadvantaged groups in the community, including the unemployed, people with little formal education, people from non-English speaking backgrounds, people from low socioeconomic areas, and people with disabilities.

Key messages

- 'Older' learners (25 to 54 years) responded positively to the upskilling entitlement of the Victorian Training Guarantee, with the uptake of vocational education and training (VET) by this group estimated to have increased by 4.2 percentage points by comparison with the rest of Australia between January 2011 and June 2012.
- The evidence indicates a significant improvement in the match between course choices and the officially recognised skills in demand, with enrolments skewed towards courses with relatively high expected wages upon completion.
- Importantly, these outcomes were also applicable to people from more disadvantaged backgrounds, such as the unemployed, people from non-English speaking backgrounds and people with disabilities. Improved alignment of course choice with the skills in demand should impact on the subsequent living standards of people from such backgrounds.
- The results underline the capacity of working-age individuals, including those who are more disadvantaged, to make sound course choices in relation to jobs if given the opportunity and access to relevant information.

Dr Craig Fowler
Managing Director, NCVER

Contents

Tables and figures 6

Executive summary 7

Introduction 11

Policy background 13

- The Victorian Training Guarantee for people aged 25–54 years 14

Data and empirical method 17

- Data 17
- Difference-in-differences estimation 23

Results 27

- The influence of the Victorian Training Guarantee on participation in VET 27
- Alignment of course choice with skill demands 31

Conclusions 36

References 38

Appendix A: VET participation using the ABS Survey of Education and Work 39

Appendix B: Course participation supplementary statistics 45

Appendix C: Sensitivity tests 47

Appendix D: Course choice supplementary statistics 48

Tables and figures

Tables

1 VET reforms 2009—12 relevant for individuals aged 25 years and older 16

2 Distribution of population aged 25 to 54 years by geographic region and census year (% except where otherwise stated) 21

3 VET student enrolment rates among population aged 25—54 years, by year and population subgroup (%) 30

4 Estimated marginal effects of the VTG on course choice outcomes for ages 25—54 years, January 2011 — June 2012, unconditional difference-in-differences estimation with and without time trends 31

5 Estimated marginal effects of the VTG on course choice outcomes for ages 25—54 years, January 2011 — June 2012, conditional difference-in-differences estimation with time trends 33

6 Estimated marginal effects of the VTG on course choice outcomes across various student groups for ages 25—54 years, conditional difference-in-differences estimation with time trends 35

A1 Calculated VET enrolment rates by age group, year, state and data source 41

A2 Module completion rates within the first two years of VET course enrolment among students aged 25—54 years (%) 44

B1 VET student enrolment rates among population aged 25—54 years, by population subgroup (%) 45

C1 Key estimated marginal effects from unconditional difference-in-differences estimation, January 2011 — June 2012, alternative modelling results 47

D1 Unconditional difference-in-difference effects for course choice indicators, 2008 to 2011—12 48

Figures

A1 State-specific VET enrolment rates by age band, year and data source 40

Executive summary

Public subsidies for vocational education and training (VET) in Australia have historically been provided directly to select (mostly public) education institutions (providers) on the basis of government projections of skill demand. This approach defined the number and type of VET courses that benefited from a public subsidy, and these were predominantly allocated on a first-come-first-served basis. In 2008 Australia adopted a national reform agenda in which centralised VET funding was replaced by entitlement schemes.

The fundamental premise underlying the 2008 reform agenda is that students, if given the option, will tend to choose VET courses to suit their own economic interests, to the benefit of the wider labour market. This premise was untested when the reform agenda was introduced, and the sparse international evidence that did exist gave cause for some pessimism (see Levin 1991; Ladd 2002; Hastings & Weinstein 2008). As such, the reform agenda represented a significant gamble. This study presents some of the first statistical evidence on the effects of associated reforms.

The research examines the enrolment responses of working-age people aged 25—54 years to an entitlement introduced in Victoria from 1 January 2011 to 30 June 2012 — the Victorian Training Guarantee (VTG)[1]. The age band of the analysis complements companion studies by Leung et al. (2014) and McVicar and Polidano (2015), which focused on similar outcomes for individuals aged 15—19 years. Given that those aged between 25 and 54 years are likely to have had greater labour market experience and may enter VET for different reasons, the outcomes for this group may be different.

The focus is on the Victorian reforms because they were more ambitious than reforms introduced in other Australian states and territories. The Victorian reforms to VET funding introduced a genuine entitlement, one which substantially increased rights to and choice of publicly subsidised courses for working-age individuals. The timeframe of the analysis reflects the time period the Victorian reforms were fully implemented for the targeted age band but is prior to subsequent reforms, introduced from 1 July 2012, which sought (through the targeting of subsidies) to reshape course choices.

The study considers the extent to which the new education entitlements were taken up and the alignment between course choice and the needs of the domestic labour market. Specifically, we address the following questions:

- What effect did the introduction of the Victorian Training Guarantee have on VET enrolment numbers among those aged 25—54 years?
- What effect did the Victorian Training Guarantee have on course choice? Did it improve the alignment of enrolments with the measures of skill demand available at the time of enrolment?

1 As at 1 January 2017, the Victorian Training Guarantee was superseded by Skills First http://www.education.vic.gov.au/skillsfirst

- How did enrolments and course choices vary by age and gender and across key disadvantaged groups in the community, including the unemployed, people with little formal education, people from non-English speaking backgrounds, people from low socioeconomic areas, and people with disabilities?

An estimation of the effects of the Victorian Training Guarantee were calculated using a difference-in-differences (DiD) approach. This method is a standard quantitative approach for estimating the effects of real-world policy changes. The fundamental innovation of the approach is to disentangle the effects of policy reform from contemporaneous changes in the wider economic environment (for example, the Global Financial Crisis) by comparing the differences observed for a 'treatment' population affected by the reforms with those observed for a 'control' population which was not. In the current case, the approach compares the variation observed for the Victorian population before and after the policy change with the variation observed for the population of other Australian states during the same period. The study is based upon administrative data drawn from the National VET Provider Collection, augmented by linking information from alternative data sources, including expected graduate earnings estimates from the NCVER National Student Outcomes Survey, National Skill Shortage information from the federal Department of Employment, and regional socioeconomic and population estimates from the Australian Bureau of Statistics (ABS).

Key results

Between January 2011 and June 2012, we estimate that the introduction of the Victorian entitlement increased the rate of VET participation among 25 to 54-year-olds by 4.2 percentage points. This represents a two-thirds increase, relative to the 6.3% participation rate reported in 2008 for this age group. A disaggregated analysis indicates that the increase in participation was distributed widely across the population, including a 36-percentage-point increase among unemployed people, a 12-percentage-point increase among people with disabilities and a 13-percentage-point increase among people with only low-level (certificate I and II) VET qualifications. However, we stress that these effects may overestimate the true enrolment effects because for the period the study was undertaken, the National VET Provider Collection did not account for private fee-for-service enrolments, which are likely to have decreased under the Victorian entitlement.[2] From 2014 the National VET Provider Collection commenced collecting fee-for-service activity from private providers, in addition to government-funded training activity previously collected, thus providing Total VET Activity of the Australian training market.

The introduction of the entitlement in Victoria was also found to lead to a significant improvement in the match between course choices and officially recognised skills in demand and it skewed enrolment towards courses with a relatively high expected graduate wage. To the extent that graduate wages reflect the value of graduate skills, the latter result is further evidence of an improvement in the responsiveness of enrolments to skill needs.

2 We also attempted to cross-check these results against data from the Survey of Education and Work (SEW), which has information on participation in all VET courses, to quantify the magnitude of any bias. However, estimates from this survey did not provide any conclusive evidence on the magnitude of any bias because, despite collecting information on participation in all VET courses, the rates of VET participation were well below those estimated in the National VET Provider Collection.

Overall, the greater freedom of choice afforded by the Victorian entitlements is estimated to change the course choice mix in a way that increases the proportion of enrolments in skill shortage areas by four percentage points (a 50% increase, relative to 2008 figures), and increase expected graduate wages by 2.4%. These estimates are close to similar to those reported by McVicar and Polidano (2015) for 15 to 19-year-olds[3], which in itself is a somewhat surprising result, given the different training incentives and life experience of the respective population subgroups. In contrast to the study by McVicar and Polidano, however, the current study finds no evidence of offsetting shifts in the types of courses offered to people aged 25—54 years by private providers. We interpret this result as suggesting that working-age individuals were less swayed than their younger contemporaries by the increased availability of privately run courses with relatively high consumption and low labour market benefits (including health and fitness courses).

Across the groups identified in this study, we find no reason to believe that people from disadvantaged backgrounds respond in a less positive way than the remainder of the population. We find improvements in course choice alignment with skill demand for all groups. Moreover, improvements were greater for the unemployed than the employed, greater for those from a non-English speaking background than those who speak English at home, greater for those living in a low socioeconomic status (SES) area than in more advantaged areas and greater for Aboriginal and Torres Strait Islanders than for non-Indigenous people. For individuals with disabilities, we find improvements that are no smaller than for those without disabilities; and for those without a secondary qualification we find greater improvements in expected wage returns, but lower improvements in the match between enrolments and skill shortage areas. In the last case, our results are primarily attributable to the fact that people without a secondary qualification do not tend to enrol in courses that lead to higher-skilled occupations, but rather in courses that are higher paid, especially in construction, logistics and sales. These results suggest that disadvantaged people aged 25 to 54 years do seek out courses with good expected labour market outcomes, outcomes likely to have a particularly profound bearing on subsequent living standards.

Implications

The results from this study underline the capacity of people aged 25 to 54 years, including people from disadvantaged backgrounds, to choose VET courses that are better aligned with the prevailing needs of the domestic labour market than was the practice under previous supply-driven funding models. These results are more impressive when taking into account the large number of available courses and the paucity of course graduate outcome information available to support decision-making.

The current results contrast sharply with the relatively negative outcomes reported for large-scale entitlement schemes for private secondary schooling (Hsieh & Urquiola 2006), but the current study is ill-equipped to consider the important question of why this is the case. In any event, there is a clear gap between the educational decisions made by a parent for their child and those made by an older adolescent or working-age adult for themselves.

3 McVicar and Polidano (2015) report a 3.9-percentage-point increase in the proportion of enrolments in skill shortages and 2.3% improvement in expected graduate wages for 15 to 19-year-olds.

Moreover, vocational education and training is, by design, a form of education closely aligned with the technical skills requirements of the workforce. The results of the current study highlight the choices made by more mature individuals in exercising an 'entitlement' to improve the responsiveness of VET to changing skill demands.

For policy-makers, evidence that disadvantaged people seek out courses with good expected labour market outcomes supports current efforts to improve available course outcome information, including employment information, through the MySkills website. However, an area for further improvement may be in the provision of more disaggregated graduate employment information. Currently, graduate occupation information is limited to ANZSCO[4] major group level (for example, Technician and trades workers, Managers, Labourers), which provides no indication to prospective students on the likelihood of their finding work after graduating in the occupation for which the course is designed to prepare them. Such information may be important, given that there is a weak match between the course target occupation and the occupations that course graduates attain (Karmel, Mlotkowski & Awodeyi 2008) and the likely importance of occupation choice in driving course choice.

While the provision of labour market information may be important in helping to support decision-making, governments should also be aware of the risks. In particular, there is a risk that people may systematically over-respond to skill demand signals, leading to graduate oversupply in areas where there are few supply-side barriers to entry. Governments can play a role here by monitoring year-on-year changes in course enrolments and by complementing the provision of graduate outcome information with longer-term skill projections.

4 ANZSCO = Australian and New Zealand Standard Classification of Occupations.

Introduction

Tailoring education policy to deliver the skills needed by modern labour markets is complicated by the rapid pace of technological change. These complications are amplified when the associated risks of technological redundancy and the lengthening working lifetimes are taken into account. At the heart of the challenge for policy-makers is allocating public funding in a way that improves the responsiveness of the sector to changing skill and labour market needs.

This study adds to the existing evidence base on this issue by reporting on the effects of an Australian reform that introduced an entitlement for VET, whereby the availability of public funded VET courses was expanded and where its allocation was linked to student choice. This policy reform was part of the Australian Government's National Partnership Agreement on Skills Reform, established in 2008 to enhance the VET sector's responsiveness to labour market needs.[5] The key premises underlying the reforms were that expanding entitlements to public subsidies would increase participation in education and that, given greater freedom of choice, people would pursue skills in demand by employers. We test both of these premises by estimating the effects on enrolments of reforms introduced in the state of Victoria, known at the time this research was undertaken as the Victorian Training Guarantee (VTG).[6]

The focus on Victorian reforms in this study is motivated by the fact that, unlike other Australian states, Victoria imposed relatively liberal conditions on the take-up of entitlements in the initial years of the Victorian Training Guarantee, such as broad student eligibility criteria; uncapped training places for those eligible; and a wide choice of courses. The only restriction on course choice under the Victorian Training Guarantee was that enrolments for those aged 20 years and over had to be at a higher level than any previously attained qualification (from July 2011).[7] By focusing on the Victorian Training Guarantee, the results in this study provide insights into the impacts of moving from a supply-side to a 'close to pure' demand-side model of VET funding.

The study focuses on the following questions:

- What effect did the introduction of the Victorian Training Guarantee have on VET enrolment numbers among those aged 25 to 54 years?
- What effect did the Victorian Training Guarantee have on course choice? Did it improve the alignment of enrolments with the measures of skill demand available at the time of enrolment?
- How did enrolments and course choices vary by age and gender and across key disadvantaged groups in the community, including the unemployed, people with little formal education, people from non-English speaking backgrounds, people from low socioeconomic areas, and people with disabilities?

5 The need of reform and the objectives of VET reforms were first spelt out in the National Agreement for Skills and Workforce Development in November 2008.
6 Victoria's training and TAFE system was superseded by Skills First on 1 January 2017.
7 Other states maintained some aspects of a supply-driven system by restricting the use of the entitlement to courses on state government priority lists.

By addressing these questions, this study provides much needed empirical evidence on the enrolment responses of mature-aged people to expanded access to, and choice of, publicly funded VET courses. An analysis on the responses of disadvantaged people is important because previous evidence on the use of entitlements in private schooling in the United States found weak responses from disadvantaged groups (Levin 1991; Ladd 2002), partly because they have poor information for making good choices (Hastings & Weinstein 2008). However, the findings from these US studies may not apply to the very different educational context examined in this study.

As far as we are aware, only one previous study has examined the effects of training entitlements on mature-age people. Schwerdt et al. (2012) consider the effects of a voucher for short courses in classroom-based VET in Switzerland for individuals aged 20—60 years. Overall, the estimates reported in that study indicate no significant labour market benefits delivered by the Swiss policy. The study by Schwerdt et al., however, is not generally applicable to VET course choices because the Swiss voucher was only redeemable for short (42 hours on average) adult education courses (including language, leisure and job-related courses), which are outside the formal post-compulsory education sector. In contrast, the reform considered here affected all public subsidies for VET study, with the explicit objective of improving efficiency of the domestic labour market.

By concentrating on the outcomes of working-age people (25 to 54 years), this study extends a previous study by McVicar and Polidano (2015), which focused on the outcomes of the Victorian Training Guarantee for 15 to 19-year-olds. McVicar and Polidano (2015) found that, as well as increasing enrolments between 2008 and 2011, the Victorian Training Guarantee significantly increased the proportion of enrolments in courses associated with skill shortages and high expected earnings. This study considers whether these results carry over to mature-aged people.

The pre-reform period of analysis runs from January 2006 to December 2008, and the post-reform period from January 2011 to June 2012, recognising that the Victorian reforms were rolled out gradually during the intervening period. The estimation of the effects of the Victorian Training Guarantee on enrolment choices is conducted using a difference-in-differences (DiD) approach, which in essence involves comparing the changes in VET enrolment outcomes in Victoria with those observed in other states during the same timeframe before and after the reform. This approach takes advantage of the fact that Victoria implemented changes in education policy before the other Australian states, so that comparisons with the other Australian states help to control for contemporaneous variation, including changes in the economic cycle and other aspects of national policy, which is not of interest here.

The data for analysis are drawn primarily from the National VET Provider Collection, a large administrative dataset. The National VET Provider Collection was augmented by linking information from alternative data sources, including expected graduate earnings estimates (adjusted for the characteristics of students who enrol in them) from the NCVER National Student Outcomes Survey, National Skill Shortage information, and regional socioeconomic information from the ABS.

Policy background

Traditionally, the VET funding model in Australia could be categorised as supply-driven, with caps on the number of publicly subsidised places determined centrally and funds allocated directly to select (mostly public) VET providers, largely on the basis of historical enrolments and government forecasts.[8] Under this system, unless they have an exemption, students in subsidised places pay a fee based on an hourly rate, but with a maximum overall fee chargeable in a given year.[9] Access to a publicly funded place was based largely on a first-come-first-served basis, but with priority access given to specific groups. For example, until 2009 in Victoria, the Guaranteed Place in TAFE program guaranteed a publicly funded place to people aged 16—19 years with secondary school or equivalent qualifications. Prospective students who missed out on a publicly funded place could enrol in a full-fee-paying (unsubsidised) VET course with a public or private provider.

In March 2008, the Council of Australian Governments (COAG) reached an agreement, known as the National Agreement for Skills and Workforce Development (NASWD), to amend the delivery of public subsidies for VET: away from a supply-driven model to one where public funding follows individual enrolment choices. This agreement was motivated by concerns of waning productivity growth, increased global competition and the impacts of demographic change on labour force participation. The reform was designed to improve VET participation and the sector's response to skill needs (Productivity Commission 2012). As part of the national agreement, a series of targets was established to improve the skill level of the Australian workforce, including the target to double the proportion of working-age Australians with certificate level III qualifications or above.

For individuals aged 25 years and over, the National Agreement reforms were supported by commitments from governments, state and federal, to deliver extra publicly funded places in VET under the National Partnership Agreement on Productivity Places Program (NPAPPP) and the Compact with Retrenched Workers. The National Partnership Agreement commenced on 1 July 2009 (concluding June 2012) and involved a commitment from the state governments to deliver 400 000 additional training places for qualifications of national priority, defined by current skill shortages and emerging skill needs. Around 133 000 places were allocated to job seekers and 270 000 to existing workers, with the Australian Government meeting the full cost of job-seeker places and state governments and employers sharing the cost of worker places (60% employer, 40% state government). The Compact with Retrenched workers was introduced between 1 July 2009 and 31 December 2009 to give those aged 25 years and over who had lost their jobs during the Global Financial Crisis access to government-subsidised training towards a higher-level qualification. It is important to stress that the extra places in training were capped and were over and above those that state governments made available through traditional channels described above.

8 An exception is the user choice program (introduced in 1998), where eligible employers and apprentices/trainees were given the freedom to choose their own registered training organisation (RTO).

9 Course fee exemptions and concessions are determined by the individual states. Generally speaking, those eligible for fee exemptions/concessions are low-income earners and other disadvantaged members of the community.

Each state and territory exercised some discretion over the reforms that it chose to implement in pursuit of the National Agreement for Skills and Workforce Development. One aspect of this discretion concerns the timing of associated reforms. Victoria was the first state to implement a reform package to address the requirements of the National Agreement for Skills and Workforce Development with its introduction of the Victorian Training Guarantee from July 2009.[10] South Australia followed in 2012, Queensland in 2013, Western Australia and Tasmania in 2014, and New South Wales in 2015. Importantly, during the period of analysis examined in this study, January 2006 to June 2012, traditional supply-driven VET funding models remained in place in all states except Victoria. Details of the Victorian reforms and how they affected people aged 25 years and over are described in the section below.

The Victorian Training Guarantee for people aged 25–54 years

In August 2008 the Victorian Government announced the introduction of the Victorian Training Guarantee to meet its commitments under the National Agreement for Skills and Workforce Development. The Victorian Training Guarantee introduced an entitlement to a VET course of an individual's choosing, including with private providers, replacing the old system where the number of publicly funded places was fixed and tied to specific courses with specific public providers. For our group of interest, 25 to 54-year-olds, the entitlement was subject to an 'upskilling requirement', which meant that it had to be at a higher than existing level. Certain exemptions to this rule were made. These included foundation courses (for example, English literacy), courses that are part of an apprenticeship, and courses undertaken by students with special circumstances, such as asylum seekers and people referred for training under the National Partnership for Single and Teenage Parents (Department of Education and Early Childhood 2012).

We examine the impacts of the Victorian Training Guarantee for enrolments between January 2011 and June 2012, the period over which the full enrolment responses of the entitlement could be observed for 25 to 54-year-olds. Between the time it was first introduced (July 2009) and the time it was fully rolled out (January 2011), the Victorian Training Guarantee was only made available to select groups on a temporary basis (table 1). During the transition period, for those aged 25 to 54 years who were not part of the select group eligible for the entitlement, the existing supply-driven allocation model remained in place. Although the entitlement continued to operate past this time, it was under very different conditions. Specifically, from July 2012 the Victorian Government partially wound back the demand-driven reforms under the guise of a new policy, 'Refocussing VET', by changing the subsidy regime to make it more targeted to areas where the state government perceived the greatest need. These reforms also included the removal of the course fees caps that were in place prior to the Victorian Training Guarantee. Another reason why we do not examine impacts beyond this time is that South Australia implemented its own student demand-driven reforms from July 2012, which means that our counterfactual outcomes would be contaminated beyond this point.

While the central changes introduced by the Victorian Training Guarantee over the period of analysis were the uncapping of publicly funded places and the linking of funding to course

10 The Victorian reforms preceded the associated national agreement.

choice, the impacts estimated in this study may not be purely related to these two factors. The impacts may also be the result of provider responses, some of which include offering inducements to enrol and changing course fees. In the case of the latter, providers were given greater flexibility to compete on price within established caps on hourly rates and the total course fees.[11] As well as allowing providers greater freedom to compete on price, the Victorian Government increased its fee caps for diploma-level courses to reflect the relatively high private benefit from completing these courses. Ideally, we would isolate and remove the effects of provider response on our results. However, in practice we do not have data available to do this. Instead, the compromise is to control for any effects on enrolment due to provider compositional changes related to pre- and post-reform changes in provider type (TAFE, ACE[12], university, industry/professional body or non-government organisation, private business and other) and provider size. This is discussed further in the following section on the empirical analysis.

11 There are also minimum course and hourly fee rates.

12 TAFE = technical and further education; ACE = adult and community education.

Table 1 VET reforms 2009–12 relevant for individuals aged 25 years and older

Start	End	Scheme	Vic	Rest of Aus.	Age	Labour status	Courses[2]	Places limited[3]
July 2009	Feb. 2011	NPAPP[1]		✓	15+	Job seekers and employed	Upskilling and foundation	Yes
July 2009	Dec. 2011	Compact with Retrenched Workers	✓	✓	25+	Retrenched workers	All	Yes
July 2009	Jan. 2011	VTG[4] Skills for Growth	✓		20+	Employees with SMEs	Upskilling and foundation	No
July 2009	Jan. 2011	VTG Skills for Life	✓		20+	All	Upskilling for diplomas and above	No
July 2009	Ongoing	VET FEE-HELP	✓	✓	All	All	Diploma and above	Yes
Jan. 2010	Jan. 2011	VTG with Retrenched Workers	✓		25+	Retrenched workers	Upskilling and foundation	No
Jan. 2011	Ongoing	VTG extension	✓		20+	All	Upskilling and foundation	No
July 2012	Ongoing	Refocussing VET	✓		All	All	Upskilling and foundation	No

Notes: 1 National Partnership Agreement on Productivity Places Program.
2 Upskilling limited to certificate II+ for job seekers and certificate III+ for employees, in areas with skill shortages.
3 Entitlements and eligibility depend upon post-school qualifications obtained, and are subject to annual caps imposed. See text for details.
4 Victorian Training Guarantee

0 Data and empirical method

The empirical analysis focuses on answering the key research questions, as outlined in the introduction. To do so, we require data from a range of sources over the period of analysis, January 2006 to December 2008 (pre-reform) and January 2011 to June 2012 (post-reform). The Victorian Training Guarantee was implemented in stages for 25 to 54 year-olds; thus the transition years (2009—10) were omitted from the analysis.

This section describes the data sources used and defines key variables. It then describes the statistical approach, which is designed to distinguish the effects of policy reform from the changes attributable to other contemporaneous variation (for example, the Global Financial Crisis).

Data

The main data source used in this study is individual student-level course enrolment data from the National VET Provider Collection, with graduate wage information from the NCVER Student Outcomes Survey (SOS), skill shortage information from the federal Department of Employment and contextual information from the ABS linked in to create a rich dataset. The main elements of the data are discussed below.

The National VET Provider Collection

The National VET Provider Collection, managed by the National Centre for Vocational Education Research, is an administrative dataset of all government-funded VET course enrolments in Australia, including those with private VET providers. The data were reported by providers to state training authorities (STAs) that administered the funding, who in turn reported to NCVER. The data describe a wide set of variables, covering course, college and student-specific characteristics. The National VET Provider Collection is the most detailed data source of VET currently available for Australia and is the principal dataset considered for the study. In addition to the universe of student enrolments in publicly funded courses, the dataset also describes fee-for-service courses delivered by public (TAFE, other government and ACE) providers. Furthermore, some data are reported for fee-for-service courses delivered by private sector providers, although these institutions were under no formal obligation to do so at the time.

In November 2012, the then Council of Australian Governments (COAG) Standing Council of Tertiary Education, Skills and Employment (SCOTESE) agreed to the introduction of mandatory reporting of nationally recognised training activity from 2014 onwards. Under the mandatory reporting requirements, all Australian providers (except those exempted by regulators) delivering nationally recognised training to students, either in domestic or overseas locations, must report information about these students and their training.

As a consequence, from 2014, the National VET Provider Collection commenced collecting fee-for-service training activity from private providers, in addition to government-funded training activity previously reported.

In this study, we use data on all enrolments for publicly funded providers in our attempt to capture the full effects of the reforms, including the effects of substitution between publicly funded and fee-for-service courses. Fee-for-service enrolments with private

providers are not included because they are not likely to represent enrolments from this sector. As such, any substitution between private fee-for-service VET and the rest of the VET system cannot be fully assessed with the National VET Provider Collection.

The sample is all new student enrolments among those aged 25 to 54 years during the period of analysis, where student age is defined as at 1 January in the year of enrolment (determining Victorian Training Guarantee eligibility). Individuals aged 55 years and over are omitted from our sample frame, recognising that individuals closer to retirement age are likely to have different motivations for study.

A feature of VET is that students regularly enrol in more than one course within a year, including multiple courses at the same time. In this study, when examining enrolment rates, we discount multiple enrolments by the same student in a calendar year, but when examining course choice, we use all student enrolments, including multiple enrolments for the same student.[13]

As well as the rich set of controls, an important feature of the National VET Provider Collection for statistical purposes is that it reports detail for the Government-funded population, which is a sub-set of the VET population. The size of the sample allows reasonably accurate statistics to be calculated for marginal population subgroups, including disadvantaged subgroups, who are of particular interest. In this study, the following disadvantaged groups are the focus: individuals who did not complete secondary school and do not have any vocational equivalent qualification (certificate III or above); the unemployed (out of work, but looking for work) at the time of enrolment; individuals living in low socioeconomic areas (lowest 20% on the SEIFA Index of Disadvantage); Aboriginal and Torres Strait Islanders (ATSI); and people from non-English speaking backgrounds (NESB) who speak a language other than English at home. Other population subgroups considered in the study include women, people aged 45 to 54 years, and people living outside an urban area. It is important to keep in mind that these subgroups are not mutually exclusive; for example, someone living in a low-SES area may also not have a secondary school qualification.

VET enrolment rates

In this study we measure impacts on enrolment rates using commencing course enrolment data from the National VET Provider Collection. As this collection is an administrative dataset, it contains only information on people who enrolled in VET and nothing about people who did not. Thus, participation rates using the National VET Provider Collection (excluding multiple new enrolments by the same individual in a given calendar year) had to be generated using data from census population estimates published by the ABS.[14] Importantly, we include fee-for-service and publicly funded courses in the analysis in an attempt to capture total effects and not merely the effects for publicly funded courses. However, a limitation of the National VET Provider Collection data is that it did not include

13 Using multiple enrolments for the same student means that there is likely to be correlation across course choice observations, which raises issues for the estimation of standard errors. However, estimating results with cluster-robust standard errors (clustered at the student level) makes little difference to the standard errors, which suggests that this is not a major issue.

14 Census data are available for 2006 and 2011. For non-census years, population estimates were approximated using linear interpolation. Population aggregates by labour market status were evaluated by disaggregating the census population by the population shares reported in the January waves of the Labour Force Survey.

fee-for-service enrolments from private providers. As a result, we only capture substitution between fee-for-service and publicly funded courses within public institutions, which means that our estimated enrolment results may overestimate the true enrolment effects.

It is important to note that data from an alternative source, the ABS Survey of Education and Work (SEW), was used to cross-check our enrolment results using the National VET Provider Collection. The Survey of Education and Work had the advantage over the National VET Provider Collection in collecting information on all VET enrolments, regardless of whether it was fee-for-service or publicly funded. Despite collecting enrolment information for all VET courses, the enrolment rates described by the survey were found to be lower than those described by the National VET Provider Collection by a substantial margin for both Victoria and NSW (the largest comparison state, see appendix A). These observations suggest that the enrolment rates for VET described by the Survey of Education and Work are biased downward. Furthermore, comparisons between the survey and the National VET Provider Collection indicate greater off-trend year-on-year variation in the enrolment rates described by the SEW.

As with all surveys based on randomly administered questionnaires, the most likely sources of the biases in the Survey of Education and Work are survey non-response and survey-response bias. The National VET Provider Collection at the time, being an administrative dataset of all publically funded VET courses, is ostensibly free from both of these biases. In relation to survey non-response, it is commonly recognised that voluntary response rates tend to be lower among middle and low-SES groups (for example, Warriner & Miller 2002). This is a concern for the current study, because VET participation rates (according to the National VET Provider Collection) are concentrated among these groups (Lim & Karmel 2014).[15] While survey weights can help to mitigate systematic survey non-response of this type, the magnitude of the VET enrolment biases provide little confidence in the utility of the weights for this purpose. Even if the SEW was perfectly representative of the national population, however, it could still describe biased VET enrolment rates, due to the difficulties respondents experience recalling past events, the framing and phrasing of survey questions, the desire to give socially acceptable responses, the characteristics of the respondent and the characteristics of the interviewer (Nederhof 1985; Furnham 1986).

The existence of biases in the VET enrolment rates described by the Survey of Education and Work would not pose a problem for the current analysis, if it could reasonably be assumed that the absolute size of these biases would be unaltered throughout our period of analysis. Unfortunately, the volatility that we identify for year-on-year variation of enrolment rates, as indicated by the survey, argues against such consistency. As we cannot, therefore, broadly predict how the biases associated with the Survey of Education and Work might influence the results obtained, we omit consideration of this survey from the remainder of this study.

15 In principle this can be adjusted for using weights, but only if the weights are up to date and capture differences in survey participation rates in the population.

State characteristics

In conducting any analysis of impacts on enrolments and course choice, it is important to control for any changes in the population that may occur in Victoria and the rest of Australia. While we control explicitly for such changes in the regression (discussed in the next section), we also present them in table 2 to provide some assurance to the reader that there were no major structural changes in Victoria that were not observed in the rest of Australia. To the extent that such structural changes occurred and were not controlled for in the regression, our regression estimates would be biased.

Table 2 reveals that the population share of most of the subgroups considered for our analysis altered little between 2006 and 2011. The most substantial variation is observed for education status, where the proportion of 25 to 54-year-olds reporting that they held a bachelor degree or above increased by five percentage points in Victoria and four percentage points in Australia between 2006 and 2011, offset by a similar decline in the proportion of the study population reporting none of the listed qualifications. The next most substantive shift is reported for the proportion of the population born in Australia, which increased by three percentage points in Victoria and four percentage points in the rest of Australia. Otherwise the changes in the population characteristics reported in table 2 are in the region of two percentage points or less.

Table 2 Distribution of population aged 25 to 54 years by geographic region and census year (% except where otherwise stated)

	Victoria			Rest of Australia		
	2006	2011	Diff.	2006	2011	Diff.
Gender						
Male	49	49	0	49	49	0
Female	51	51	0	51	51	0
Age						
25–29	15	17	2	15	17	2
30–34	17	16	0	17	16	-1
35–39	18	17	-1	18	17	-1
40–44	17	17	0	18	17	0
45–49	17	16	-1	17	17	-1
50–54	15	16	0	16	16	0
Country of birth						
Australia	67	69	3	67	70	4
Foreign-born	33	31	-3	33	30	-4
ATSI						
Indigenous	5	5	0	7	7	0
Non-indigenous	95	95	0	93	93	0
Place of residence						
Urban	95	96	1	88	89	0
Rural	5	4	-1	12	11	0
Highest previous education						
Bachelor and above	24	29	5	22	26	4
Advanced diploma/diploma	9	10	1	9	10	1
Certificate III & IV	16	17	1	17	18	1
Certificate I & II	1	1	0	1	1	0
Certificate nfd	2	2	0	2	2	0
Other	48	41	-7	50	43	-7
Disability	2	2	0	2	2	0
Labour force status						
Employed	78	80	2	78	79	2
Unemployed	3	3	0	4	3	0
Not in labour force	19	17	-2	19	18	-1
TOTAL ('000s)	2099	2164	65	8377	8619	242

Note: Estimates are subject to rounding error.

Source: Authors' calculations using census data reported for 2006 and 2011, and employment status reported by the Labour Force Survey, January 2006 and January 2011.

A second notable feature revealed by table 2 is the similarity of the distribution of population characteristics reported for Victoria and the remainder of Australia. Disparities between Victoria and the rest of Australia reported in the table are mostly less than one percentage point. The most important deviations are reported for the proportions of the respective populations living in rural locations, which are seven percentage points lower in Victoria than the national average. The basic similarities between the populations living in Victoria and the remainder of Australia are an important motivation for the use of the remainder of Australia as a basis for comparison in the analysis.

The match between course choices and labour market needs

The quality of a course choice extends over a broad set of dimensions, including private considerations of the students enrolled, their prospective employers, and the wider needs of the community. This study, by necessity, takes a relatively narrow perspective, by focusing on the match between course choices and contemporaneous labour market needs. This focus was a key motivation underlying the reforms with which we are concerned and relates closely to an examination of the premise that students, if given the choice, will pursue skills that are in demand by employers.

The first metric we consider is the proportion of course enrolments that prepare students for occupations on the national annual skill shortage lists, identified at the time of enrolment. National skill shortage occupations at the 6-digit level (Australian and New Zealand Standard Classification of Occupation [ANZSCO]) are linked to the occupations in the National VET Provider Collection that best match the intended course outcome. National skill shortage lists are constructed from employer interviews and skill forecasts and can be conceptualised as unmet demand for skills, given the prevailing labour market conditions. We use this measure because it is widely recognised and is a focus of interest for governments, education providers and prospective students.

However, the national skill shortage list is an imperfect measure of skill needs. Its binary nature means that it cannot indicate the extent of any shortage. Absence from the list does not necessarily mean that a skill is not in shortage; rather, it may be that there was no information available concerning particular occupations at the time of publication. Furthermore, the national measure cannot identify regional differences in skill needs. Given these points, how should we interpret observations about the relationship between course choices and the national skill shortage lists?

Suppose that the data indicate a wide divergence between the courses that students choose to take up when they are given additional freedom and the skill shortage lists. This result would suggest to us two likely alternatives. First, it may be that the students had aligned themselves with local labour market needs, but that these needs were inadequately represented by the national skill shortage lists. Second, it may be that the national skill shortage lists are closely aligned with labour market needs, but that students failed to respond to these needs. Either one of these alternatives would be worrying and would point to the need for further research. Alternatively, it may be that the alignment between student course choices and national skills shortage lists improved after students were given additional flexibility in relation to subsidised courses. Although alternative interpretations of such a result exist, it would suggest to us that: the skills shortage lists do provide useful detail on local labour market needs; and that students take such detail into consideration when making their decisions.

The second metric we consider for evaluating the match between course choices and labour market needs is average expected course graduate wage, adjusted for the characteristics of the students who enrol in different courses. In this study, we use recent course graduate earnings, adjusted for student characteristics, as a proxy for expected earnings. Using recent adjusted graduate earnings for this purpose may be a valid proxy for expected earnings if wages are not expected to change substantially during the period of study (typically 12—18 months) or if students are short-sighted. By 'short-sighted' we mean that, when choosing a course, students put more weight on prevailing labour market conditions than possible future labour market developments to predict the likely outcomes from studying different courses. Such behaviour is supported by statistical evidence. (See, for example, Ryoo & Rosen 2004.)

To estimate adjusted graduate earnings, we use data from the National Student Outcomes Survey (SOS), a large and nationally representative sample of VET graduates conducted in the year following course completion (see <http://www.ncver.edu.au/sos> for more information). The sampling frame for this survey is the population of VET completers in the preceding year, drawn from the National VET Provider Collection dataset. The survey reports updated information for student characteristics and current labour market outcomes, including weekly earnings for those employed. To adjust for student characteristics, we estimate a log wage regression for completers aged 25 to 54 years at the time of the survey on dummies for course level and field of education combinations, controlling for student characteristics. Student characteristics include gender, full-time/part-time employment, labour force status prior to study, prior education qualifications, disability status and socio-demographic factors. The coefficients on the dummy variables are interpreted as the average return for different course choices, conditional upon observed student controls, and on finding employment in the year after study.

Difference-in-differences estimation

The analysis focuses upon pre- (January 2006 to December 2008) and post-reform (January 2011 to June 2012) changes in VET enrolments observed for Victoria. The basic methodology that we employ is designed to distinguish the changes attributable to the Victorian Training Guarantee from changes attributable to other contemporaneous variation during the sample period by comparing statistics for Victoria against those for the rest of Australia. The basic underlying assumption of this analytical approach is that, in the absence of the Victorian Training Guarantee, course enrolments in Victoria would have followed similar trends to the rest of Australia, where traditional supply-driven funding models continued to apply.

The approach is employed, and which is briefly outlined above, is referred to as a Difference-in-Differences, DiD, analysis. It is a common approach for government program evaluations (see, for example, Blundell & Costa Dias 2009, for a review). This approach is designed to exploit natural experiments where there is a change in the policy setting of an affected group, but none in another, due to factors that are not related to the outcomes of interest. In this setting, the variation in treatment is related to the implementation of reforms in Victoria ahead of those in other states.

The standard unconditional DiD model is represented by:

$$y_i = \alpha + \gamma Vic_i + \lambda Post_i + \delta Vic * Post_i + u_i \quad (1)$$

where y_i denotes the considered enrolment metric of individual i. This is either the decision to enrol; the choice of a course on the national skill shortage list; or the estimated wage premium of a chosen course. α is a constant, Vic is a dummy variable taking the value 1 if the individual's enrolment was in Victoria and 0 if in the rest of Australia; $Post_i$ is a dummy taking the value 1 if the individual entered VET post-reform and 0 pre-reform; and *u* is a residual.

The parameter δ is commonly referred to as the treatment effect and it measures the change in Victorian outcomes from pre- to post-reform, over and above the post-reform trends reported for the rest of Australia. This coefficient is the focus of our interest, and is interpreted as the effect of the Victorian Training Guarantee, controlling for contemporaneous variation in the economic environment. All regression tables report the (marginal) effects represented by δ as percentages. Equation (1) is used to explore the effects of the Victorian Training Guarantee on VET enrolment rates. It is unconditional, in the sense that it is adapted to report population average effects on enrolment outcomes during the sample period. In the unconditional regression results for enrolment rates, the variances associated with these coefficients are trivial to evaluate.[16] The National VET Provider Collection administrative dataset ostensibly reports information for the entire government-funded VET student population, omitting fee-for-service courses offered by private providers. Similarly, the 2006 and 2011 census datasets report information for the full Australian population. (Full datasets for each census were accessed via TableBuilder Pro.) The aggregates calculated using these data sources are therefore appropriately considered population statistics and are not subject to the usual concerns associated with random sampling.[17]

Combining census population numbers with the student numbers reported by the National VET Provider Collection limits our analysis of enrolment rates to statistics that can be computed using simple cross-tabulations. In contrast, we are able to take advantage of greater flexibility for our empirical examination of course choices. Access to extensive micro-data permit estimation of the following extension of equation (1) for course choice:

$$y_i = \alpha + \gamma Vic_i + \lambda Year_i + \pi Month_i + \delta Vic * Post_i + \theta t_i^s + \omega INT_i + \beta UN_i + u_i \quad (2)$$

where $Year_i$ and $Month_i$ are dummy variables representing the year and month of enrolment, which is coded 1 if the enrolment is in a specific year and month combination and 0 otherwise; t_i^s (coded 1, 2, 3, 4, 5 for 2006, 2007, 2008, 2011, 2012) is a state-specific linear time trend; INT_i is an indicator of whether the state of the student's residential address is different from that in which they are studying; and UN_i is a lagged unemployment rate (lagged because it is the prevailing rate at the time of enrolment) from the student's

16 If the enrolment rate is r, evaluated for a population of size N, then the variance of the rate is given by r.(1-r) / N.

17 The linear interpolations used to approximate population sizes beyond 2006 and 2011 introduce a margin of error to the calculated VET participation rates. Although this error is difficult to quantify, it is likely to be small. This is because the population subgroups considered for analysing VET participation rates are highly aggregated, and are reasonably stable during the sample period, as indicated by statistics reported in table 2.

statistical local area (SLA).[18] The month of enrolment dummy is added to control for any changes in the timing of enrolment on course choice that occurred over the period of analysis. Enrolments peak in January/February (start of the school year in Australia) and in July (start of the second semester), but can commence at any time of the year.

A key assumption of the standard DiD approach is that, in the absence of the Victorian Training Guarantee, course enrolments in Victoria would have followed the same post-reform trends as observed in the rest of Australia (the common trends assumption). In practice, there are likely to be many reasons to anticipate state-specific trends; for example, due to differences in state-level policies (especially related to VET) and economic fluctuations. The regression specification described by equation (2) is adapted to address this concern in four ways.

First, our principal specifications use information from all other states as a control group, which avoids the risk that the results hinge on variation specific to any one state. We have conducted sensitivity analysis with respect to the choice of control group by generating similar results using only New South Wales as a counterfactual. This alternative, which is also considered for our analysis of enrolment rates, had no substantive impact on the results obtained; the associated results are reported for completeness in appendix C.

Second, the indicator INT_i controls for possible spillover effects of the Victorian reforms into other states (which are our controls). Failure to control for spillover effects of this type is likely to lead to an underestimate of the true effects of the Victorian reform.

Third, we control for differences in regional economic trends across Australia, as measured by the lagged regional (statistical local area) unemployment rate associated with the student's place of residence.

Fourth, the state-specific linear time trends suggested by Angrist and Pischke (2009) are included in equation (2) to accommodate the diverging linear time trends across the states observed pre-reform, which may be assumed to persist into the post-reform period. This is important because the analysis conducted on the pre-reform period shows diverging linear time trends in enrolment outcomes across the states, including between Victoria and the rest of Australia.[19] To the extent that these persisted post-reform, failure to control for them would tend to bias the estimated effects of the Victorian Training Guarantee. The effect of controlling for divergent time trends on the unconditional difference-in-differences estimates is shown in the results section.

For course choice, the treatment effect, or δ from equation (2), estimates the overall effect of the reform, including both the effects from greater freedom of choice and student and provider compositional effects. It is difficult to consider how any one of these aspects of the reform may have affected VET enrolments in isolation, as we only observe the combined effect of all three. Nevertheless, the rich data reported by the National VET Provider Collection permit us to control for observed changes in the composition of the

18 SLA is a geographical division from the ABS that is larger than a postcode, but smaller than a local government area.

19 This analysis is carried out by estimating equation (1) on the pre-reform period and also estimating equation (1) with the Vic. dummy substituted with a series of state-specific dummies. In the former case, evidence of diverging linear trends is evidenced by a significant coefficient on the Vic*Post dummy. In the latter case, diverging trends among states other than Victoria is evidenced by an F-test result that showed the State*Post interaction effects for all other states were jointly different from zero.

student and provider populations. This type of analysis provides one way to understand the underlying drivers of the overall effects estimated for the Victorian Training Guarantee. Any reduction in the estimated treatment effect of the Victorian Training Guarantee consequent on the inclusion of controls for the student and provider populations could indicate that the VTG influenced enrolments through these channels (that is, by altering the pool of students and/or providers). Any residual of the overall effect left unexplained by these controls can be attributable to unobserved features of the reform, which we argue are likely to be from the greater flexibility of course choice afforded by the VTG.

Variables describing provider and student characteristics are consequently included as right-hand-side controls in equation (2). Compositional changes in the student body controlled for include gender, age expressed in five-year bands, combined indicators for migrant status and whether English is spoken at home; whether Aboriginal or Torres Strait Islanders (ATSI); five major ABS remoteness indicators assigned to the student's residential postcode (major city to very remote Australia); quintiles of the ABS Socio-economic Index for Areas (SEIFA) relative disadvantage measure from 2006 (pre-reform periods) and 2011 (post-reform periods) applied to the student's residential postcodes; employment status identifiers and highest education level attained, measured as less than Year 12 or vocational equivalent (certificate III), Year 12 or vocational equivalent and tertiary qualification (certificate IV and above). The provider compositional changes that we control for are provider size (enrolment numbers within five bands) and provider type (TAFE, ACE, university, industry/professional body or non-government organisation, private business and other).

Unlike the estimates for course participation, because the estimation of equation (2) is based on individual enrolment data with provider and student controls, the precision of the reform effect estimates is reported with p-values. In simple terms, in this context a p-value represents the probability that the true effect of the reform is zero (no effect), given the magnitude of the estimated reform effect. Using the conventional approach, we treat estimated effects as statistically significant if their p-values are less than 10% (90% confidence). When estimating p-values, a common issue is correlation in the errors terms across observations (u_i), which can severely bias standard errors and resulting p-values. A concern here is that correlation in observations within a state, because of common institutional and policy settings, leads to standard errors that are grossly underestimated (Bertrand, Duflo & Mullainathan 2004). The implication is that estimated effects are wrongly treated as being significant when they are not. In this study, we deal with this issue by estimating p-values based on cluster-robust standard errors from the T(G-1) distribution, as suggested by Cameron and Miller (2015). However, we acknowledge that, because we only have a small number of clusters — one for each state and territory — we may still fail to adequately correct for intergroup correlation, which Cameron and Miller (2015) states needs to be 30—40. We also estimate p-values based on wild bootstrapped standard errors (1000 draws), which Cameron, Gelbach and Miller (2008) show perform well when group size is small, including when the group size is six (see appendix C).

Results

The influence of the Victorian Training Guarantee on participation in VET

The analysis focuses on the incidence of course commencements reported during the 2008 calendar year and in the 12 months between July 2011 and June 2012 and excludes multiple enrolments by the same individual within a calendar year. Table 3 summarises the results of our unconditional DiD analysis (equation 1) of the effects of the Victorian Training Guarantee on participation in VET among the population aged 25 to 54 years.

Enrolment (commencement) rates for 25 to 54-year-olds evaluated for Victoria are reported on the left-hand side of the table, and those for the rest of Australia (excluding Victoria) are on the right-hand side. The right-most column reports the difference in the change in enrolment rates between 2008 and 2011—12 reported for Victoria, relative to the rest of Australia, or the unconditional difference-in-differences. Table 3 shows that total VET enrolment rate for 25 to 54-year-olds increased from 6.3% to 11.3% in Victoria, and from 4.9% to 5.8% in the rest of Australia during this period. Hence, the VET enrolment rate for 25 to 54-year-olds in Victoria, relative to the remainder of Australia, increased by 4.2 percentage points — or two-thirds of its 2008 value — following introduction of the Victorian Training Guarantee.

These results suggest that the expansion of study entitlements and the increase in the public budget spent on VET following the Victorian Training Guarantee consequently coincided with a substantial rise in VET enrolments among working-age Victorians. Importantly, the growth in enrolments in Victoria relative to the rest of Australia is likely to be a result of the VET reforms and not related to the pre-existing trends that continued into the post-reform period (see table B1 appendix B). However, we stress that these results are likely to overestimate any true enrolment effect because they do not fully account for substitution between public and private fee-for-service enrolments.

The disaggregation of enrolment rates by individual characteristics reveals some interesting variation. The statistics reported towards the top of the table indicate that VET enrolment rates for men and women were similar during the period of analysis: the enrolment rates for men in Victoria increased by just under one percentage point more than for women, after adjusting for contemporaneous shifts reported for the rest of Australia (4.5 cf 3.8 percentage points).

Disaggregating VET enrolment rates by age group reveals that the rise reported for Victoria, relative to the rest of Australia, was concentrated towards individuals at the beginning of their working lives. VET enrolment rates among individuals aged 25—29 years increased between 2008 and 2011—12 by 5.1 percentage points more in Victoria than they did in the rest of Australia, compared with an increase of 3.3 percentage points among individuals aged 50—54 years. This interpretation of the data, however, ignores the fact that enrolment rates tend to decline with age. In proportional terms, the increase in enrolment rates reported for Victoria, relative to the rest of Australia, tends to rise with age, from just under 60% for 25 to 29-year-olds, up to just under 80% for 50 to 54-year-olds.

The Victorian Training Guarantee therefore appears to have eroded the gap between the age groups reported here. This is consistent with the fact that a common set of reforms

affected this entire population subgroup. It also suggests, however, that the upskilling requirements imposed as part of the reforms did not disproportionately restrict the VET participation of older workers. We return to discuss the influence of upskilling requirements in the following subsection.

Australia has one of the highest proportions of foreign-born residents of any Organisation for Economic Co-operation and Development (OECD) country.[20] Table 3 indicates that the enrolment rate in VET among foreign-born residents exceeded the rate among the Australian-born population by just over a fifth in Victoria in 2008, and by just over a quarter in the rest of Australia. These disparities widened between 2008 and 2011—12 in both Victoria and the rest of Australia. The last column of the table indicates that enrolment rates in VET increased by just over four percentage points between 2008 and 2011—12 among both natives and foreign-born residents in Victoria, relative to the rest of Australia. This is consistent with the fact that the Victorian Training Guarantee reforms omitted any explicit distinction by migrant status.

The findings reported for the Indigenous population represent outliers in table 3. In particular, table 3 shows a small increase in Indigenous VET participation in Victoria following the Victorian Training Guarantee, which does not keep pace with the increase observed in the rest of Australia. It is difficult to point to specific reasons for the lack of response to the Victorian Training Guarantee among Indigenous people in Victoria. One explanation may be that Indigenous people may have had priority access to a publicly funded place in VET prior to the reforms considered here.

The data provided in table 3 indicate that VET participation among 25 to 54-year-olds was higher for people living in rural areas compared with people living in urban areas. The higher rates of VET participation in rural areas may reflect differences in the rural and urban labour markets. Generally speaking, a higher proportion of the labour market is employed in non-professional occupations in rural areas, especially in primary industries, which rely more on skills developed through VET than they do on higher education.[21] In absolute terms, the VET enrolment rates appear to have increased between 2008 and 2011—12 in Victoria, relative to the rest of Australia, by a slightly higher margin for populations living in rural relative to urban areas. In proportional terms, however, the urban population appears to have responded more strongly to the Victorian Training Guarantee reforms.

The enrolment rates distinguished by highest level of previous qualifications indicate that most of the increase between 2008 and 2011—12 in Victoria, relative to the remainder of Australia, was concentrated among individuals with relatively low prior qualifications. Enrolment rates are reported to increase most strongly in Victoria among individuals with lower-level, certificate I and II, qualifications, rising by 12.7 percentage points, relative to the rest of Australia. The next largest effects on enrolment rates are reported for the 'other' education group, which includes individuals with no post-school qualification, with an increase of 7.9 percentage points in Victoria, relative to the remainder of Australia. The

20 Data reported for 2011 by the OECD (the most recent series available) indicate that Australia had the third highest proportion of residents born overseas (26.6%), slightly behind Switzerland (27.3%), and more substantively behind Luxembourg (42.1%; table A4). *Stocks of foreign-born population in OECD countries and the Russian Federation*, International Migration Outlook 2013, OECD.

21 Data from the Household Income and Labour Dynamics in Australia survey suggest that 39% of employed people living in urban centres were employed in professional and managerial jobs compared with 28% of the working population outside urban centres in 2013.

only other group displaying a relative increase in enrolment rates in Victoria are individuals with certificate III and IV qualifications, which increased by 6.7 percentage points relative to the rest of Australia. In contrast, enrolment rates in Victoria declined slightly, relative to the rest of Australia, among individuals with bachelor degrees or above. These shifts in emphasis by prior educational qualifications are consistent with the focus of the Victorian Training Guarantee on qualification upskilling, as discussed earlier.

The questions used to impute disability status differ between the National VET Provider Collection and the census. The statistics reported in table 3 for the disability subgroup should consequently be interpreted as approximate only. Nevertheless, the DiD statistics reported for this subgroup are substantial, indicating a 12% increase in VET enrolment rates in Victoria, relative to the rest of Australia, associated with the Victorian Training Guarantee.

The effects distinguished by labour status are also striking. The data reported for 2008 indicate higher rates of VET enrolments among individuals aged 25 to 54 years in Victoria, relative to the rest of Australia, in all three population subgroups distinguished by labour status. The largest differences between Victoria and the rest of Australia reported for 2008 are for the unemployed, where the proportion of individuals enrolled in VET in Victoria is just under 37%, relative to 29% for the rest of Australia. Although VET enrolment rates among the unemployed in the rest of Australia increased by eight percentage points from 2008 to 2011—12, this was a fraction of the associated increase observed for Victoria during the same period, so that the difference between Victoria and the rest of Australia widened by 36 percentage points. In 2011—12, just over four in every five unemployed Victorians aged 25 to 54 years were reported to be enrolled in a VET course.[22] In contrast, the participation response for employed people is more subdued. The results reported for employed individuals indicate a relative increase in VET enrolment rates in Victoria, relative to the rest of Australia, which — at 4.4 percentage points — is similar to the wider population (4.2 percentage points on average).

The large estimated increase in VET participation among unemployed people is consistent with the strong response of people with low qualification levels (less than certificate level III) and suggests that the people who stand to benefit most from improved employment opportunities are those who most readily take advantage of increased access to VET. The large increase in unemployed VET participation is also likely to be driven by improved access to foundation courses, afforded under the Victorian Training Guarantee, especially general skills training courses, which aim to improve employability. We estimate that among the unemployed, the Victorian Training Guarantee is associated with a 13 percentage point increase in foundation course enrolments (table D1, appendix D).

22 This result is due to large changes in the number of people in VET in Victoria who report being unemployed in the National VET Provider Collection and not due to changes in the number of unemployed in Victoria from the census. Over this period there were also no changes in the way in which unemployed was identified in the National VET Provider Collection and which may have biased the results. Unemployed in the VETPC is defined as not currently in work, but seeking full-time or part-time work.

Table 3 VET student enrolment rates among population aged 25–54 years, by year and population subgroup (%)

	Victoria			Rest of Australia[a]			DiD[b]
	2008	2011–12	Change	2008	2011–12	Change	
Gender							
Male	6.4	12.0	5.5	4.5	5.4	1.0	4.5
Female	6.2	10.7	4.6	5.4	6.1	0.7	3.8
Age							
25–29	8.5	14.7	6.1	6.7	7.7	1.0	5.1
30–34	7.0	12.5	5.5	5.6	6.7	1.1	4.4
35–39	6.6	11.6	4.9	5.3	6.0	0.7	4.2
40–44	6.0	11.0	5.0	4.7	5.6	0.8	4.2
45–49	5.5	9.9	4.4	4.2	4.9	0.7	3.7
50–54	4.1	8.1	4.0	3.2	3.9	0.7	3.3
Country of birth							
Australia	5.9	10.5	4.7	4.5	5.0	0.5	4.2
Not Australia	7.2	13.2	6.0	5.8	7.6	1.8	4.2
Indigenous status							
Indigenous	2.0	2.7	0.7	3.8	5.5	1.7	-1.0
Non-Indigenous	6.6	11.8	5.2	5.0	5.8	0.8	4.5
Place of residence							
Urban	6.2	11.1	4.9	4.7	5.4	0.8	4.2
Rural	9.4	16.6	7.3	6.7	8.0	1.4	5.9
Highest previous education							
Bachelor and above	2.7	2.6	-0.1	2.4	3.0	0.6	-0.7
Adv. diploma/diploma	5.3	6.4	1.1	4.3	5.5	1.2	-0.1
Certificate III & IV	6.1	14.5	8.4	4.9	6.7	1.7	6.7
Certificate I & II	11.6	25.6	14.0	9.5	10.8	1.3	12.7
Certificate nfd[c]	3.0	4.3	1.3	2.1	3.3	1.2	0.1
No post-secondary quals	8.7	17.4	8.7	6.3	7.0	0.8	7.9
Has a disability[d]	24.0	40.3	16.3	15.9	20.3	4.4	11.9
Labour force status							
Employed	4.4	9.1	4.7	3.6	4.0	0.4	4.4
Unemployed	36.8	81.1	44.3	28.6	36.6	8.0	36.3
Not in labour force	10.0	9.5	-0.5	7.3	8.1	0.8	-1.3
TOTAL	6.3	11.3	5.0	4.9	5.8	0.8	4.2

Notes: a) Population aggregates for 2008 and 2011—12 approximated by assuming linear interpolations from census data. Rest of Australia are data for the whole of Australia, excluding data from Victoria.

b) DiD is unconditional difference-in-differences, or differences in the change in Victoria and the change in the rest of Australia.

c) nfd = not further defined.

d) Disability identified in the National VET Provider Collection as positive responses to the question: 'Do you consider yourself to have a disability, impairment or long-term condition?'

Source: Authors' calculations. Enrolment numbers evaluated from VETPC micro-data.

Alignment of course choice with skill demands

Unconditional and conditional difference-in-difference results are presented in tables 4 and 5 respectively. In contrast to the enrolment rate results presented above, the estimates are based on all publicly funded VET enrolments, including multiple enrolments by the same student. The results in table 4 are unconditional because we do not control for any changes in the composition of the student body or composition of provider characteristics that occur post-reform (as discussed previously); only the changes in national trends in course choice, regional economic trends, seasonal factors and changes in (across the border) interstate study are controlled for. The main results of interest are the estimated Vic*Post coefficients, which are the measured effects of the reform on our course choice outcome measures. Other results presented in these tables are for select controls; namely, the annual national trends in the outcome measures relative to 2008 (Time trend) and the effect of Victoria-specific factors that are unchanged over the period (Vic), such as differences in courses offered in Victoria.

Table 4 Estimated marginal effects of the VTG on course choice outcomes for ages 25–54 years, January 2011 – June 2012, unconditional difference-in-differences estimation with and without time trends

	No time trends		**Linear time trends**		**State-specific linear time trends**	
	National skill shortage	Expected returns	National skill shortage	Expected returns	National skill shortage	Expected returns
	%pt.	%	%pt.	%	%pt.	%
Time trend (ref: 2008)						
2006	-2.6	4.6	-1.9	3.9	-4.0	6.3
p-value	13.5	0.1	22.2	0.0	0.2	0.0
2007	-5.2	-8.2	-4.9	-8.5	-5.9	-7.4
p-value	1.6	0.0	4.1	0.0	0.5	0.0
2011	-5.8	2.6	-5.4	2.1	-4.2	0.5
p-value	0.9	0.0	2.7	0.3	12.8	45.2
2012	-4.3	-5.0	-4.3	-5.1	-1.9	-7.7
p-value	0.9	0.0	1.0	0.0	42.8	0.0
Vic	-4.7	0.7	-7.0	3.1	-7.0	3.3
p-value	2.0	17.9	0.0	0.2	0.0	0.1
Vic*Post	**6.6**	**-0.8**	**4.2**	**2.0**	**4.0**	**2.4**
p-value	**0.0**	**19.4**	**6.8**	**0.0**	**6.4**	**0.0**
Sample size	1 380 765	2 174 137	1 380 765	2 174 137	1 380 765	2 174 137

Notes: All models are estimated with month of enrolment dummies, whether or not the state of residence is different from the state of study and SLA unemployment rates. The results corresponding to the listed parameter in the right-hand side of the table represent the estimated model coefficient or marginal effects (from the equations above) and the values underneath are their associated p-values. A p-value represents the probability that we would observe the estimated coefficient, given that there is no underlying relationship between the course choice variable and the model parameter. A p-value less than 10 is statistically significant at the 90% confidence level, less than 5 is significant at the 95% confidence level and less than 1 is significant at the 99% confidence level. P-values are generated using cluster-robust standard errors from the T(G-1) distribution, as suggested by Cameron and Miller (2015) for estimation with small group sizes.

Importantly, looking at the differences in the estimated reform effects with and without linear time trends (columns four to five versus two to three), we can see that controlling for pre-reform trends in course choice measures is important to the estimation of the effects of the Victorian Training Guarantee. In particular, to the extent that the pre-reform trends continued post-reform, failure to account for them would tend to overestimate any effect on national skill shortage enrolment rates and underestimate any effect on expected returns. However, the little difference in results between columns 4—5 and 6—7 suggests that our results are not sensitive to the use of state-specific time trends rather than common time trends (for states other than Victoria). Given that our standard model specification is to use state-specific time trends, overall, we can say that, for those aged 25—54 years, the Victorian Training Guarantee was associated with course choice changes that increased the rate of enrolments in skill shortage areas by four percentage points and increased the expected earnings at graduation by 2.4% (compared with what may have been expected under the former supply-driven funding model) between January 2011 and June 2012 (table 4). Thus, we conclude that moving from a centrally administered funding model to one based on student choice improved the alignment between skill demands and course choice for those aged 25—54 years. This is consistent with the McVicar and Polidano (2015) study, which found that the Victorian Training Guarantee improved the same course choice outcomes for 15 to 19-year-olds.

To isolate any overall effect of the Victorian Training Guarantee that may be due to increased freedom of course choice, we add controls for changes in the composition of students and providers (as described previously), the other two main channels through which effects may be transmitted. The results for these models are presented in table 5 and are very close to those for the unconditional model, which suggests that our overall results are being driven by greater freedom of choice, which is also consistent with the findings of McVicar and Polidano (2015) for 15 to 19-year-olds.

Table 5 Estimated marginal effects of the VTG on course choice outcomes for ages 25–54 years, January 2011 – June 2012, conditional difference-in-differences estimation with time trends

	Unconditional		With student controls		With student and provider controls	
	National skill shortage	Expected returns	National skill shortage	Expected returns	National skill shortage	Expected returns
	%pt	%	%pt	%	%pt	%
Time trend (ref: 2008)						
2006	-4.0	6.3	-3.8	6.3	-3.8	6.3
p-value	0.2	0.0	0.5	0.0	0.7	0.0
2007	-5.9	-7.4	-5.7	-7.5	-5.8	-7.5
p-value	0.5	0.0	0.4	0.0	0.4	0.0
2011	-4.2	0.5	-4.3	0.6	-4.0	0.8
p-value	12.8	45.2	12.6	39.4	11.9	28.9
2012	-1.9	-7.7	-2.3	-7.4	-2.0	-7.2
p-value	42.8	0.0	36.5	0.0	35.8	0.0
Vic	-7.0	3.3	-6.7	3.4	-6.5	3.2
p-value	0.0	0.1	0.0	0.1	0.0	0.2
VicxPost	4.0	2.4	3.9	2.5	4.1	2.5
p-value	6.4	0.0	6.4	0.1	3.3	0.1
Sample size	1 380 765	2 174 137	1 374 359	2 164 226	1 373 442	2 162 518

Notes: All models are estimated with month of enrolment dummies, whether or not the state of residence is different from the state of study and statistical local area (SLA) unemployment rates. The results corresponding to the listed parameter in the right-hand side of the table represent the estimated model coefficient (from the equations above) and the values underneath represent their p-value. A p-value represents the probability that we would observe the estimated coefficient, given that there is no underlying relationship between the variable of interest and the model parameter. A p-value less than 10 is statistically significant at the 90% confidence level, less than 5 is significant at the 95% confidence level and less than 1 is significant at the 99% confidence level. P-values are generated using cluster-robust standard errors from the T(G-1) distribution, as suggested by Cameron and Miller (2015) for estimation with small group sizes.

Interestingly, the improvement in alignment with apparent skill demands occurs despite large increases in foundation course enrolments. We estimate (using unconditional DiD) that the Victorian Training Guarantee is associated with a seven-percentage-point increase in the proportion of enrolments in foundation courses in Victoria from January 2011 to June 2012 (see table D1 in appendix D). Foundation courses by and large do not prepare people for specific occupations, meaning that they are not related to skill shortages or highly paid jobs. Among foundation courses, the biggest increase has been in vocational training courses designed to give people the general skills to find work. A possible reason for the large increase in foundation course participation not greatly affecting alignment with skill demands is that enrolments in these areas are likely to have replaced enrolments in other general courses, such as English language courses, literacy and numeracy (in other basic) courses, which are not exempt from the upskilling requirement. We also estimate the Victorian Training Guarantee to be associated with around a five-percentage-point increase in the proportion of enrolments in apprenticeships/traineeships (table D1), which as well as foundation courses were exempt from the upskilling requirement. As to be expected, the Victorian Training Guarantee is also estimated to have increased the proportion of 25 to 54-year-olds enrolling at a higher level by 19 percentage points (table D1). However, this effect is not as large as might be expected because the participation response to the Victorian Training Guarantee was greatest for those with less than certificate III qualifications (table 3).

An important point to make is that estimated improvements in the alignment of course choice with skill demands are not just being driven by changes in enrolments in a handful of courses. The Victorian Training Guarantee resulted in changes in VET course enrolments across at least half of the broad fields of education (table D1).

Effects for select sub-groups

The results for specific student groups, including disadvantaged groups, are presented in table 6. The first set of results are the effects of the Victorian Training Guarantee estimated for those who are members of the group listed in the first column and the second set are the marginal effects of the Victorian Training Guarantee for all other students, that is, those not a member of the specific group. For example, those who are not a member of the group aged 45—54 years are all those who are aged 25—44 years, regardless of whether or not they are members of any of the other groups listed in column 1. The final set of results is the difference in the effect of the Victorian Training Guarantee between those who are a group member and those who are not. For differences with p-values less than 10, we conclude that, on average, group membership is associated with significantly different course choices in response to the increased freedom of course choice available under the Victorian Training Guarantee.

Interestingly, we find very different responses between males and females to increased course choice under the Victorian Training Guarantee. In particular, greater freedom of choice for females is associated with an 11-percentage-point increase in the proportion of enrolments in skill shortage areas. This contrasts with around a three-percentage-point *reduction* for males. However, we find no difference in the expected returns from course choice between males and females. A possible explanation is that there are persistent skill shortages in a number of female-dominated occupations, especially in the areas of food, hospitality and personal services, especially aged care. The increased availability of publicly funded places post-Victorian Training Guarantee has witnessed a growth in female enrolments in these areas (table D1 in appendix D).

Importantly, we find that improvements in alignment between course choice and labour demand are consistent across all disadvantaged groups, which suggests that all disadvantaged groups respond in a positive way to greater freedom of course choice. Moreover, we find no evidence that the improvements in alignment between course choice and skill demand are any lower for disadvantaged groups, and in some instances — those living in low-SES areas, the unemployed and those from non-English speaking backgrounds — the improvement is significantly greater for both measures. The only exception is significantly lower proportional increases in the skill shortage enrolments associated with the Victorian Training Guarantee among those without secondary school qualifications, although this is not matched by lower expected course returns. A possible interpretation is that skill shortage occupations tend to be higher-skilled jobs, in which 25 to 44-year-olds without a secondary school equivalent are less likely to enrol, even if given increased opportunity. However, they are more likely to take advantage of the opportunity by enrolling in courses with higher expected returns, particularly in courses that prepare them for higher-paid jobs in sales, retail, construction and logistics.

Table 6 Estimated marginal effects of the VTG on course choice outcomes across various student groups for ages 25–54 years, conditional difference-in-differences estimation with time trends

Group	Member of the group		Not a member of the group		Difference	
	VicxPost	p-value	VicxPost	p-value	VicxPost	p-value
Aged 45–54						
National skill shortage (%pt)	5.1	2.3	3.4	4.9	1.7	0.8
Expected returns (%)	1.8	1.5	3.1	0.0	-1.2	2.5
Female						
National skill shortage (%pt)	11.1	0.1	-2.7	6.3	13.9	0.0
Expected returns (%)	2.7	0.9	2.4	0.2	0.3	75.8
Rural						
National skill shortage (%pt)	4.7	0.4	3.8	8.6	0.9	55.6
Expected returns (%)	2.4	0.0	2.6	0.2	-0.2	51.0
Disadvantaged groups						
Unemployed						
National skill shortage (%pt)	8.0	1.5	2.5	7.1	5.5	0.8
Expected returns (%)	5.5	0.0	0.8	7.8	4.7	0.0
Without secondary qualification or equivalent						
National skill shortage (%pt)	3.1	10.0	4.8	1.7	-1.8	0.1
Expected returns (%)	3.8	0.0	1.6	1.4	2.1	0.1
Aboriginal or Torres Strait Islander						
National skill shortage (%pt)	6.5	3.7	4.1	3.3	2.5	8.9
Expected returns (%)	3.6	0.1	2.5	0.1	1.1	15.3
Has a disability						
National skill shortage (%pt)	5.2	3.8	4.0	3.3	1.1	17.2
Expected returns (%)	6.4	0.0	2.2	0.3	4.2	0.0
Live in a low SES area						
National skill shortage (%pt)	7.8	1.7	4.0	3.5	3.9	0.9
Expected returns (%)	4.6	0.0	2.4	0.2	2.2	0.0
Non-English speaking background						
National skill shortage (%pt)	10.1	1.1	2.9	6.3	7.2	0.6
Expected returns (%)	4.6	0.1	1.9	0.3	2.7	0.1

Notes: All models are estimated with month of enrolment dummies, whether or not the state of residence is different from the state of study and statistical local area (SLA) unemployment rates. The results corresponding to the listed parameter in the right-hand side of the table represent the estimated model coefficient (from the equations above) and the values underneath represent their p-value. A p-value represents the probability that we would observe the estimated coefficient given that there is no underlying relationship between the variable of interest and the model parameter. A p-value less than 10 is statistically significant at the 90% confidence level, less than 5 is significant at the 95% confidence level and 1 is significant at the 99% confidence level. P-values are generated using cluster-robust standard errors from the T(G-1) distribution, as suggested by Cameron and Miller (2015) for estimation with small group sizes.

Conclusions

Replacing long-standing VET-centred funding models with broad-based entitlement schemes in Australia was introduced as part of national reforms designed to upskill the workforce and to make the VET sector more responsive to skill needs. At the time, the key assumptions were that people would respond to these changes by engaging more in training and by choosing courses that are better aligned with skill needs than was the case under the centralised funding model. These assumptions are tested in this study by focusing on the responses of working-age individuals aged 25—54 years to the introduction of the Victorian entitlement, an entitlement more generous and less restrictive than that which has since been implemented in other states.

Using National VET Provider Collection data, the results presented in this paper suggest a substantial increase in course enrolments associated with the Victorian entitlement. We find that between January 2011 and June 2012, the rate of VET participation in Victoria among working-age people increased by five percentage points (from 6.3% to 11.3%), which, controlling for contemporaneous changes, leaves a 4.2-percentage-point increase in VET participation associated with the introduction of the entitlement (table 3). This represents a two-thirds increase in the VET participation rate. Importantly, the increase in participation associated with the entitlement was across the board, including a 36-percentage-point increase among unemployed people, a 12-percentage-point increase among people with disabilities and a 13-percentage-point increase among those with only low-level VET qualifications (certificates I and II). The only group where the entitlement is not associated with any increase is for Aboriginal and Torres Strait Islanders, which may be because the entitlement did not provide any extra avenues to training above those already in place. However, it is important to stress that these are likely to represent an upper bound of any true enrolment effects because we are unable to capture, using the National VET Provider Collection, reductions in fee-for-service enrolments with private providers. The analysis, using participation rates from the Survey of Education and Work, which includes all enrolments, did not provide any conclusive evidence on the magnitude of any bias.

We also find that the introduction of the entitlement in Victoria led to an improvement in the match between course choice and skill demand. Overall, the introduction of the Victorian entitlement is estimated to increase the proportion of enrolments in skill shortage areas by four percentage points (table 4). Given that we estimate that only 8.3% of 25 to 54-year-old enrolments were in skill shortage areas prior to the reforms (2008), this represents a large improvement, in the order of 50%. Similarly, we find that changes in the course mix associated with the entitlement were associated with 2.4% higher expected graduate earnings (table 4). These results are very close to those estimated in a comparable study for 15 to 19-year-olds (McVicar & Polidano 2015) — 3.9-percentage-point increase in the proportion of enrolments in skill shortages and 2.3% improvement in expected graduate wages. One striking difference in the results between the two studies is that, while controlling for compositional changes in provider types increased the estimated alignment of enrolments with skill demand among 15 to 19-year-olds, no such adjustments in the results were found for 25 to 54-year-olds (table 5). This suggests that increases in the proportion of privately provided training (negatively) affected the alignment of enrolments with skill demand for 15 to 19-year-olds only. A possible explanation is that working-age

students were less likely to be swayed by the increased availability of privately run courses with high consumption (and low labour market) benefits, such as health and fitness courses.

We find that these improvements in course choice alignment with skill demand occurred across all groups examined, including disadvantaged groups such as those with disabilities, those without a Year 12 qualification or equivalent, Aboriginal and Torres Strait Islanders, people from non-English speaking backgrounds, unemployed people and people from low-SES areas. Furthermore, we find that the magnitude of the benefits for these groups is at least as great, if not greater, than for the rest of the community (table 6). Again, this result is consistent with the findings of McVicar and Polidano (2015) for 15 to 19-year-olds.

The findings from this study further underline the capacity of people, irrespective of their backgrounds, to make good course choices, given greater freedom to do so, at least as measured in this study. This is a striking result, given the large number of VET courses available and the limited information on likely course graduate outcomes available to people when enrolling. People from disadvantaged backgrounds may be strongly motivated to seek out good options in VET because, compared with making choices about their schooling (school choice and school dropout), they may see VET as more closely aligned with their future prospects. For policy-makers, the results in this study provide further evidence of the importance that students place on available labour market information when making course choices.

The evidence in this study supports the recent changes (July 2015) to the MySkill website, especially that linking information on skills in demand to individual and employment outcomes is likely to further improve course choice. However, there may still be more to do in this area. Course employment outcomes are provided only at a highly aggregated level (total graduate employment rates), with graduate destination information limited to ANZSCO major group level (for example, Technician and trades workers, Managers, Labourers). Graduate destination information at such a course level provides no indication to prospective students on the likelihood that they will find work after graduating in the occupation for which the course is designed to prepare them. This may be important information, given that there is a weak match between the target occupation and the occupations that they actually get (Karmel, Mlotkowski & Awodeyi 2008) and the likely importance of occupation choice in driving course choice.

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Appendix A: VET participation using the ABS Survey of Education and Work

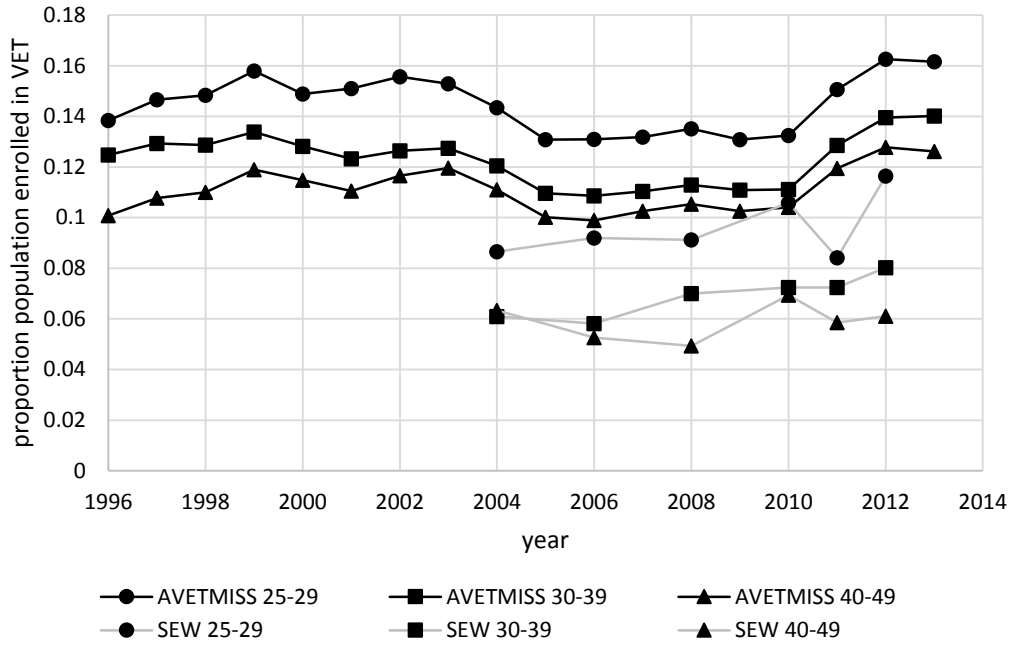
The enrolment rates discussed in this report were calculated by dividing the enrolment numbers reported by the National VET Provider Collection administrative dataset by the population estimates calculated from ABS census and Labour Force Survey data. The Survey of Education and Work (SEW), which is collected by the ABS in conjunction with the May wave of the Labour Force Survey, is an alternative micro-data source of education characteristics for Australia. Furthermore, the SEW has an advantage, relative to the National VET Provider Collection, in that it reports data for a random sample of the full Australian population (excluding individuals in particularly remote parts of the country), and can consequently be used to evaluate enrolment rates without referencing a secondary data source.

While the enrolment rates evaluated using National VET Provider Collection data indicate a substantive increase in VET participation in Victoria from 2011, the SEW data indicate no systematically discernible difference between enrolments in Victoria and those in NSW. This conclusion is revealed by the age-specific trends for VET student rates reported by the two data sources, presented graphically in figure A1.

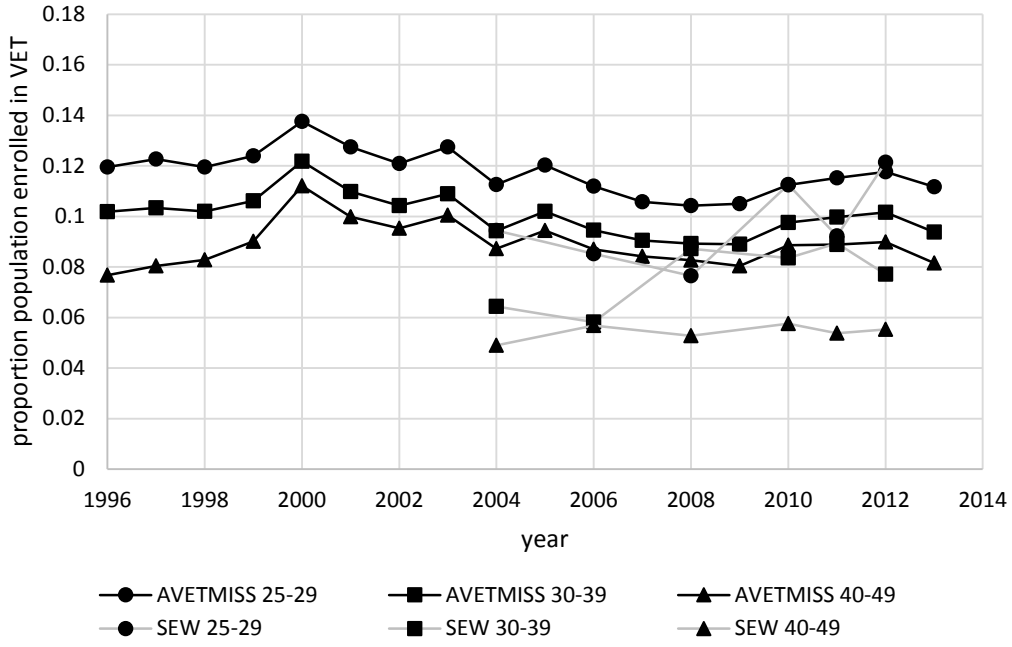
The SEW rates displayed in figure A1 were all calculated using data reported for the year preceding the respective survey. Larger differences with the National VET Provider Collection enrolment rates are obtained if study at the time of each SEW survey wave is considered for analysis, but the results are otherwise qualitatively similar.

Panel A of figure A1 displays the VET enrolment rates calculated for Victoria. This panel indicates that the enrolment rates calculated using National VET Provider Collection data are consistently higher than rates calculated for equivalent periods from data reported by the SEW. The VET enrolment rates for Victoria calculated using National VET Provider Collection data exceed those calculated using the SEW by approximately five percentage points for all age groups in all years considered for the two data sources. Furthermore, whereas the enrolment rates calculated using the National VET Provider Collection vary fairly smoothly and systematically through time for each of the three age bands, the SEW rates display greater volatility, both between and within age bands.

Figure A1 State-specific VET enrolment rates by age band, year and data source



Panel A: VET enrolment rates in Victoria



Panel B: VET enrolment rates in New South Wales

Note: National VET Provider Collection time series calculated by dividing the student numbers reported in the *Historical time series of vocational education and training in Australia*, by the ABS population estimates reported in ABS cat.no.3101.0.

SEW time series calculated using reported education for preceding year, from confidentialised unit record files of the Survey of Education and Work to 2009 and the TableBuilder application thereafter.

Tabulated data underlying figure reported in table A1.

Source: Authors' calculations using data reported in table 3 of *Historical time series of vocational education and training in Australia*, NCVER; population estimates reported in tables 51 and 52 of ABS cat.no.3101.0 June 2014, and the Survey of Education and Work, waves 2005, 2007, 2009, 2011, 2012, and 2013.

Table A1 Calculated VET enrolment rates by age group, year, state and data source

	Aged 25–29		Aged 30–39		Aged 40-49	
Year	NSW	Vic.	NSW	Vic.	NSW	Vic.
VETPC data						
1996	0.119	0.138	0.102	0.125	0.077	0.101
1997	0.123	0.147	0.103	0.129	0.08	0.108
1998	0.12	0.148	0.102	0.129	0.083	0.11
1999	0.124	0.158	0.106	0.134	0.09	0.119
2000	0.138	0.149	0.122	0.128	0.112	0.115
2001	0.127	0.151	0.11	0.123	0.1	0.111
2002	0.121	0.156	0.104	0.126	0.095	0.117
2003	0.128	0.153	0.109	0.127	0.1	0.12
2004	0.113	0.143	0.094	0.121	0.087	0.111
2005	0.12	0.131	0.102	0.11	0.094	0.1
2006	0.112	0.131	0.095	0.109	0.087	0.099
2007	0.106	0.132	0.09	0.11	0.084	0.103
2008	0.104	0.135	0.089	0.113	0.083	0.105
2009	0.105	0.131	0.089	0.111	0.08	0.103
2010	0.112	0.132	0.098	0.111	0.089	0.104
2011	0.115	0.151	0.1	0.129	0.089	0.119
2012	0.118	0.163	0.102	0.14	0.09	0.128
2013	0.112	0.162	0.094	0.14	0.081	0.126
SEW-reported education status preceding year to survey						
2004	0.094	0.087	0.064	0.061	0.049	0.063
2006	0.085	0.092	0.058	0.058	0.057	0.053
2008	0.077	0.091	0.087	0.07	0.053	0.049
2010	0.113	0.106	0.084	0.072	0.058	0.069
2011	0.092	0.084	0.089	0.072	0.054	0.059
2012	0.121	0.116	0.077	0.08	0.055	0.061
SEW-reported education status at time of survey						
2005	0.07	0.053	0.045	0.042	0.034	0.033
2007	0.064	0.059	0.043	0.043	0.033	0.034
2009	0.062	0.071	0.061	0.039	0.041	0.044
2011	0.098	0.069	0.058	0.048	0.042	0.035
2012	0.075	0.075	0.058	0.048	0.041	0.042
2013	0.093	0.087	0.053	0.051	0.04	0.044

Note: VETPC data reports rates based on table 3 of *Historical time series of vocational education and training in Australia.* SEW refers to the Survey of Education and Work, based on confidentialised unit record files to 2009 and the TableBuilder application thereafter.

Source: Authors' calculations using data reported by table 3 of *Historical time series of vocational education and training in Australia*, NCVER, tables 51 and 52 of ABS cat.no.3101.0 June 2014, and the Survey of Education and Work, waves 2005, 2007, 2009, 2011, 2012, and 2013.

Panel B of figure A1 displays the VET enrolments rates for NSW on the same scale as the rates reported for Victoria in Panel A. These data are broadly similar to those reported for Victoria, in the sense that the enrolment rates implied by the SEW are generally lower than those implied by the National VET Provider Collection and display greater variation both between and within age bands. Two notable differences between Panels A and B of figure A1 are, however, discernible. First, the absolute differences between the enrolment rates implied by the SEW and the National VET Provider Collection data are generally smaller for

NSW than they are for Victoria. Secondly, there is some (weak) evidence that the difference between the enrolment rates implied by the two surveys declined for NSW, relative to Victoria. In part, this is because the SEW enrolment rates for Victoria do not reflect the pronounced increases into 2011 and 2012 described by National VET Provider Collection data. It is also, however, due to a conspicuous convergence of enrolment rates reported by the two surveys for 25 to 29-year-olds in NSW, for whom the SEW implies a higher enrolment rate than the National VET Provider Collection in 2012.

The differences between the enrolment rates implied by the SEW and the National VET Provider Collection discussed above have important implications for the current study. The National VET Provider Collection data suggest that, between 1996 and 2010, VET enrolments in Victoria exceeded those in NSW by an average margin of two percentage points, varying within a band of +/- 1.5 percentage points. The rates for 2012 and 2013 are conspicuous in this series, in the sense that they exceed 1.96 standard deviations from the respective series averages reported between 1996 and 2010 (the 95% confidence interval of a normal distribution). This excess participation in VET in Victoria, relative to NSW, is the focus of the discussion earlier in this section of the statistics reported in table 2.

However, the series of enrolment rates calculated using the SEW indicate no systematically discernible differences between the two states. Furthermore, the SEW series do not indicate any appreciable increase in enrolment rates in Victoria in 2012, relative to NSW. Indeed, between 2008 and 2012, enrolment rates in Victoria, as described by the SEW for 25 to 29-year-olds, fall by approximately two percentage points, relative to NSW, despite the introduction of — and substantial increase in public expenditure associated with — the Victorian Training Guarantee. There are at least three plausible explanations for the substantive differences we identify for the VET enrolment rates implied by National VET Provider Collection and SEW data.

First, whereas National VET Provider Collection reports administrative data for the universe of VET students, excluding fee-for-service enrolments with private-sector providers, the SEW reports responses to questionnaires administered to a random sample of the Australian population aged 15—64 years, independent of education status. This fundamental difference in survey design implies that the SEW is exposed to the distortions commonly associated with randomly administered survey questionnaires — including non-representative sampling, non-random response bias, and errors in reporting — in a way in which the National VET Provider Collection is not. Exploring this possibility further lies beyond the scope of the current study, but would appear to warrant serious consideration.

Secondly, the SEW has the advantage, relative to the National VET Provider Collection, of ostensibly capturing fee-for-service enrolments with private-sector providers. It seems unlikely to us, however, that this explanation is driving the differences in enrolment rates that we have identified between the two data sources. This difference in survey design should tend to increase the enrolment rates described by the SEW, relative to the National VET Provider Collection, but, as indicated by figure A1, the SEW reports enrolment rates that are systematically and substantively lower than those implied by National VET Provider Collection.

Finally, the SEW, being administered as part of the Labour Force Survey, may provide a clearer picture of the incidence of study considered by respondents to be of practical relevance. The lower rates of student enrolments in VET reported by the SEW may, for example, reflect a propensity for survey respondents not to report study toward courses in which they were enrolled but failed to follow through to (successful) completion. This hypothesis, if true, would have worrying implications for the efficacy of the Victorian Training Guarantee, given the weak evidence reported by the SEW for any substantive differences in VET enrolment rates between Victoria and NSW between 2008 and 2012. We test the validity of this hypothesis by considering whether there is any evidence that the increase in VET enrolments in Victoria between 2008 and 2012 was offset by a reduction in module completion rates during the same period.

Rates of VET module completion

Table A2 reports population averages for the proportion of module enrolments completed within the first two years of each student's course enrolment. The last row of table A2 immediately suggests that the lack of evidence for any appreciable increase in VET enrolments in Victoria following the Victorian Training Guarantee and implied by SEW data is unlikely to be due to a coincident increase in drop-out rates.

Echoing the data for the enrolment rates reported in table 2 in the main report, the last row (total) of table A2 indicates that module completion rates among the population of VET students aged 25 to 54 years increased from 78.3 to 83.0 percentage points in Victoria, and from 75.8 to 78.7 percentage points in NSW. Hence, VET module completion rates in Victoria, relative to New South Wales, increased by 1.8 percentage points over the four-year period between 2008 and 2012, during which time the Victorian Training Guarantee was (fully) introduced.

The summary statistics reported in the right-most column of table A2 indicate that module completion rates increased between 2008 and 2012 in Victoria, relative to NSW, in all but a small number of population subgroups. Hence, table 3 reinforces the impression inferred from table A2 that the Victorian Training Guarantee resulted in appreciably higher rates of participation in VET in Victoria.

Table A2 Module completion rates within the first two years of VET course enrolment among students aged 25–54 years (%)

State of enrolment	Victoria			New South Wales			
Year of course enrolment	2008	2012	change	2008	2012	change	DiD[a]
Gender							
Male	80.8	84.5	3.7	77.1	78.9	1.8	1.9
Female	75.9	81.4	5.5	74.8	78.6	3.8	1.7
Age band							
25–29	77.8	82.6	4.8	74.3	77.1	2.7	2.1
30–34	77.6	82.2	4.6	74.1	78.0	3.9	0.7
35–39	78.0	83.1	5.1	75.3	78.6	3.3	1.8
40–44	78.5	83.3	4.8	76.7	79.3	2.6	2.1
45–49	79.5	83.6	4.1	77.9	80.4	2.6	1.5
50–54	79.4	84.1	4.7	78.6	80.1	1.5	3.2
Country of birth							
Australia	81.7	85.4	3.7	77.1	79.5	2.4	1.3
Foreign	71.4	79.1	7.7	73.4	77.5	4.1	3.6
Indigenous status							
indigenous	75.9	74.2	-1.7	64.5	68.2	3.7	-5.4
Non-Indigenous	78.2	83.3	5.0	76.5	79.4	2.9	2.1
Location							
Urban	78.1	83.0	4.9	75.4	78.5	3.2	1.7
Rural	81.2	84.5	3.3	79.9	79.3	-0.6	3.9
Highest previous education							
Bachelor and above	77.3	88.3	10.9	76.6	80.2	3.6	7.3
Diploma & adv. dip.	78.4	87.9	9.5	76.0	79.8	3.8	5.8
Certificate III & IV	80.9	86.5	5.6	76.1	79.7	3.7	1.9
Certificate I & II	74.7	78.1	3.3	72.6	74.7	2.1	1.3
Certificate nfd	75.6	78.6	3.0	65.4	77.4	12.1	-9.1
Other	78.0	81.2	3.2	75.9	77.4	1.6	1.6
Disability[b]	70.1	73.8	3.8	61.8	69.5	7.8	-4.0
Labour force status[c]							
Employed	81.8	87.2	5.4	80.5	82.8	2.3	3.1
Unemployed	72.0	79.9	7.9	67.8	72.9	5.1	2.8
Not in labour force	72.8	70.6	-2.2	66.4	73.5	7.0	-9.3
TOTAL	78.3	83.0	4.7	75.8	78.7	2.9	1.8

Notes: a) Statistics indicate the excess of the changes from 2008 to 2012 evaluated for Victoria, relative to NSW.

b) Disability identified in National VET Provider Collection by individual responses to the question 'Do you consider yourself to have a disability, impairment or long-term condition?'

c) Labour force status coded as missing in National VET Provider Collection for 13.5% of observations in 2008, and 3.2% in 2012.

Source: Authors' calculations using National VET Provider Collection micro-data.

Appendix B: Course participation supplementary statistics

Table B1 VET student enrolment rates among population aged 25–54 years, by population subgroup (%)

	Victoria			Rest of Australia			DiD[a]	
	2006	2008	change	2006	2008	change	2008/06	2012/08
Gender								
Male	6.8	6.4	-0.3	4.3	4.5	0.1	-0.4	4.5
Female	6.1	6.2	0.1	5.0	5.4	0.4	-0.3	3.8
Age band								
25–29	8.8	8.5	-0.3	6.6	6.7	0.1	-0.3	5.1
30–34	7.5	7.0	-0.5	5.5	5.6	0.1	-0.6	4.4
35–39	6.5	6.6	0.1	4.9	5.3	0.5	-0.4	4.2
40–44	6.2	6.0	-0.2	4.5	4.7	0.2	-0.4	4.2
45–49	5.3	5.5	0.2	3.8	4.2	0.4	-0.3	3.7
50–54	4.1	4.1	0.0	2.8	3.2	0.3	-0.4	3.3
Country of birth								
Australia	6.0	5.9	-0.2	4.3	4.5	0.3	-0.4	4.2
Foreign	7.2	7.2	0.1	5.4	5.8	0.4	-0.3	4.2
Indigenous status								
Indigenous	1.6	2.0	0.4	3.8	3.8	0.0	0.4	-1.0
Non-indigenous	6.7	6.6	-0.1	4.7	5.0	0.3	-0.4	4.5
Location								
Urban	6.3	6.2	-0.1	4.4	4.7	0.3	-0.4	4.2
Rural	9.1	9.4	0.3	6.4	6.7	0.2	0.1	5.9
Highest previous education								
Bachelor and above	2.9	2.7	-0.3	2.2	2.4	0.2	-0.4	-0.7
Advanced diploma/ diploma	5.7	5.3	-0.4	3.8	4.3	0.5	-0.9	-0.1
Certificate III & IV	6.4	6.1	-0.3	4.5	4.9	0.4	-0.7	6.7
Certificate I & II	11.3	11.6	0.2	8.1	9.5	1.4	-1.2	12.7
Certificate nfd	3.6	3.0	-0.7	2.1	2.1	0.0	-0.7	0.1
Other	8.3	8.7	0.4	5.9	6.3	0.4	0.1	7.9
Disability	26.4	24.0	-2.3	17.1	15.9	-1.2	-1.1	11.9
Labour force status								
Employed	4.6	4.3	-0.3	3.2	3.6	0.4	-0.7	4.3
Unemployed	31.8	34.8	3.0	25.1	24.8	-0.4	3.4	33.7
not in labour force	9.7	10.2	0.5	7.7	7.6	-0.1	0.6	-1.2
TOTAL	6.4	6.3	-0.1	4.7	4.9	0.3	-0.4	4.2

Notes: Population aggregates for 2008 and 2012 approximated by assuming linear interpolations from census data.

a) Statistics indicate the excess of the changes from 2008 to 2012 evaluated for Victoria, relative to the same statistics evaluated for the rest of Australia.

Source: Authors' calculations. Enrolment numbers evaluated from VETPC micro-data. Population aggregates evaluated using census data reported in 2006 and 2011, and labour force status reported in June of the respective years reported by the Labour Force Survey.

Table B1 provides a limited out-of-sample test of the assumption of common underlying temporal variation that underlies the difference-in-differences (DiD) analysis of participation rates in VET between Victoria and the rest of Australia presented in the report.

An out-of-sample test of the type considered here would be facilitated by a long time series of data covering the period during which the policy that is the focus of the study was held fixed. Unfortunately, such data do not exist. Here we consider data covering the period 2006 to 2008, a three-year interval, which is slightly shorter than the four-and-a-half year interval that is the focus in the paper. Although some policy variation did take place between 2006 and 2008, this variation was minor compared with the Victorian Training Guarantee, the focus here. Both of these observations imply that we should expect far smaller DiD effects evaluated between Victoria and the remainder of Australia between 2006 and 2008 than are reported in table 3 between 2008 and 2011—12.

The right-most column of table B1 reproduces the DiD statistics for 2008 to 2011—12, the focus of discussion in the fourth section of the report. The second column from the right reports similar statistics, calculated for the period 2006—08. Two key points are of note. First, the DiD statistics for 2006 to 2008 are approximately one-tenth of the absolute magnitude of the statistics for 2008 to 2011—12. This observation underscores the substantive nature of the DiD statistics reported in this study. Secondly, the DiD statistics for 2006 to 2008 are generally negative, whereas those for 2008 to 2011—12 are predominantly positive. This suggests that, prior to 2008, VET participation rates in the rest of Australia were displaying a slight convergence toward the rates observed in Victoria. Any persistence of this convergence beyond 2008 in the absence of policy change would work to dampen the DiD statistics that are the focus of this study.

Appendix C: Sensitivity tests

Table C1 Key estimated marginal effects from unconditional difference-in-differences estimation, January 2011 – June 2012, alternative modelling results

	Unconditional		With student controls		With student and provider controls	
	National skill shortage	Expected returns	National skill shortage	Expected returns	National skill shortage	Expected returns
	%pt.	%	%pt.	%	%pt.	%
p-values based on wild boostrapped standard errors						
Time trend (ref:2008)						
2006	-4.0	6.3	-3.8	6.3	-3.8	6.3
p-value	6.8	0.0	11.2	0.0	14.4	0.0
2007	-5.9	-7.4	-5.7	-7.5	-5.8	-7.5
p-value	0.2	0.2	0.2	0.2	0.2	0.2
2011	-4.2	0.5	-4.3	0.6	-4.0	0.8
p-value	35.8	42.8	34.6	43.2	21.6	33.4
2012	-1.9	-7.7	-2.3	-7.4	-2.0	-7.2
p-value	59.8	0.2	54.8	0.2	54.0	0.2
Vic	-7.0	3.3	-6.7	3.4	-6.5	3.2
p-value	0.2	0.0	0.2	0.0	0.2	0.0
VicxPost	4.0	2.4	3.9	2.5	4.1	2.5
p-value	25.4	0.0	24.8	0.0	3.2	0.0
	1 380 765	2 174 137	1 374 359	2 164 226	1 373 442	2 162 518
NSW used as an alternative counterfactual						
Time trend (ref:2008)						
2006	-4.5	6.3	-4.6	6.4	-4.6	6.4
p-value	19.3	5.6	21.1	7.5	22.4	7.3
2007	-3.8	-8.1	-3.7	-8.2	-3.8	-8.2
p-value	21.8	11.6	21.1	11.1	19.9	11.3
2011	-1.3	0.6	-1.4	0.9	-1.7	0.9
p-value	33.7	65.9	27.0	52.4	38.0	50.2
2012	0.6	-7.6	0.1	-7.0	-0.3	-7.0
p-value	42.8	2.1	83.3	0.4	32.6	1.1
Vic	-8.3	3.8	-7.5	3.9	-8.3	3.9
p-value	3.1	3.5	6.9	2.4	8.9	3.1
VicxPost	2.2	2.2	2.2	2.1	3.0	2.3
p-value	9.1	4.2	4.2	9.7	18.5	8.2
	792 254	1 268 200	787 534	1 261 026	786 714	1 259 673

Note: All models are estimated with month of enrolment dummies, whether or not the state of residence is different from the state of study and SLA unemployment rates. P-values are generated using wild cluster bootstrapped p-values, as suggested by Cameron and Miller (2015). A p-value less than 0.1 is statistically significant at the 90% level, 0.05 is significant at the 95% level and 0.01 is significant at the 99% level.

Appendix D: Course choice supplementary statistics

Table D1 Unconditional difference-in-difference effects for course choice indicators, 2008 to 2011–12[1]

Course identifier	All	Aged 25–54	Female	Rural or remote	Unemployed
	%pt.	%pt.	%pt.	%pt.	%pt.
All English language courses[2]	-1.0	-0.6	1.9	-0.3	1.5
Foundation course	7.2	7.5	8.7	6.4	13.1
English language	1.8	3.0	2.6	-0.2	5.3
Other	5.4	4.6	6.0	6.6	7.8
All basic skills	0.9	0.5	2.1	0.8	0.3
Upskilling[3]	19.2	19.6	20.6	13.9	20.3
Apprentice/trainee	4.9	6.3	3.3	5.4	-0.2
Occupational classification of study[4]					
Manager	0.2	0.2	0.2	0.3	0.0
Professional	1.9	1.8	1.7	4.4	-2.6
Technical and trades	-2.9	-3.0	-2.8	-3.0	1.6
Community and personal service	-1.3	-1.9	0.4	0.9	1.6
Clerical and administrative	1.0	-0.1	-1.4	-1.3	-3.9
Sales workers	1.5	1.8	1.3	-0.2	4.3
Machinery operators	-0.1	-0.9	-0.3	0.1	-1.0
Labourers	2.4	2.7	0.9	3.7	2.6
Missing (not related to an occupation)	-3.0	-1.6	-0.8	-7.1	-4.6
Field of education					
Natural and physical sciences	-0.4	-0.3	-0.4	-0.2	-0.1
Information technology	-0.7	-0.6	-0.7	-0.6	-0.9
Engineering and related tech.	1.3	2.9	1.5	4.0	1.1
Architecture and building	0.2	-0.5	-0.1	0.1	-0.1
Agriculture, environmental etc.	-0.3	0.3	-0.2	0.4	-0.6
Health	-0.4	-0.6	-0.9	0.6	-1.4
Education	-2.7	-3.6	-2.9	-2.7	-0.2
Management and commerce	1.7	1.4	2.0	-0.9	0.5
Society and culture	1.5	-0.4	1.2	-1.8	3.0
Creative arts	0.0	-0.1	0.0	0.0	0.6
Food, hospitality and personal services	1.6	2.1	2.4	-1.1	-0.4
Mixed field programs	-1.2	0.0	-1.1	2.3	-0.1

Table D1 cont. (columns)

Course identifier	No secondary school equiv.	ATSI	Has a disability[5]	Low SES	NESB
All English language courses[2]	3.3	1.6	-1.6	-8.4	1.3
Foundation course	5.9	9.0	10.7	4.0	13.7
English language	1.9	0.8	3.8	4.0	9.8
Other	4.0	8.2	6.9	0.0	3.9
All basic skill courses	-1.9	-4.9	-5.5	-3.6	-0.3
Upskilling[3]	2.3	12.9	14.3	20.8	25.9
Apprentice/trainee	6.5	7.1	3.2	8.1	2.4
Occupational classification of study[4]					
Manager	0.1	0.4	0.0	0.4	0.1
Professional	0.3	2.5	-0.5	-3.4	2.3
Technical and trades	-3.5	1.8	1.9	-0.6	-0.1
Community and personal service	-2.4	2.7	1.9	2.4	-0.2
Clerical and administrative	1.0	3.6	0.5	-1.7	1.0
Sales workers	3.6	-0.2	1.1	2.3	-1.5
Machinery operators	-0.2	-0.7	0.0	-1.6	-0.1
Labourers	5.9	0.1	2.8	-0.2	3.0
Missing (not related to an occupation)	-3.7	-8.7	-5.2	4.9	1.2
Field of education					
Natural and physical sciences	-0.2	0.2	-0.2	-0.2	-0.6
Information technology	-0.6	0.8	-0.4	-0.8	-1.3
Engineering and related tech.	3.2	-2.3	1.3	7.4	2.9
Architecture and building	-0.8	-1.1	-0.5	-0.6	1.0
Agriculture, environmental etc.	-0.3	-0.3	-0.2	-0.4	0.0
Health	-1.8	-2.0	-0.6	-1.3	0.2
Education	-2.9	-3.7	-1.2	-0.6	-1.0
Management and commerce	3.0	-2.0	1.3	2.6	-1.8
Society and culture	2.8	4.6	2.6	1.1	9.4
Creative arts	0.2	2.7	1.0	0.5	-0.2
Food, hospitality and personal	1.5	1.4	-0.2	2.9	1.6
Mixed field programs	-3.6	1.2	0.1	-9.4	-9.4

Notes: 1 All statistics report differences in Victorian enrolments reported from 2008 to 2011–12, less differences in the rest of Australia reported for the same period; that is, the proportion of all VET course enrolments for the respective population subgroup corresponding to the respective course identifier, evaluated for Victoria in 2011–12, less the associated statistic revaluated for Victoria in 2008, less the same difference evaluated for the rest of Australia.

2 English language courses identified as any course with 'ENGLISH', 'ESL' (English as a Second Language), or 'ESOL' (English for Speakers of Other Languages) in its title. Basic skills courses identified as any course with 'PATHWAY', 'GENERAL EDUCATION', 'NUMERACY', or 'LITERACY' in its title.

3 Upskilling identifier missing for 14% of sample in 2008, 11% of sample in 2011 and 9% of sample in 2012.

4 Occupational classification identified from 4-digit ANZSCO code; courses without an ANZSCO code identified as 'Missing (not related to an occupation)'.

5 Disability identified in the VETPC by individual responses to the question 'Do you consider yourself to have a disability, impairment or long-term condition?'

Source: Authors' calculations. Enrolment numbers evaluated from VETPC micro-data.



National Centre for Vocational Education Research

Level 11, 33 King William Street, Adelaide, SA 5000
PO Box 8288 Station Arcade, Adelaide SA 5000, Australia

Phone +61 8 8230 8400 **Fax** +61 8 8212 3436
Email ncver@ncver.edu.au **Web** <https://www.ncver.edu.au> <http://www.lsay.edu.au>
Follow us: <https://twitter.com/ncver> <https://www.linkedin.com/company/ncver>