Effect of the downturn on apprentices and trainees

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About the research

Effect of the downturn on apprentices and trainees

Tom Karmel and Damian Oliver, NCVER

At the onset of the Global Financial Crisis (GFC) in 2008—09, the Australian training system experienced a sharp decline in the number of apprentice commencements. Ultimately, the impact of the economic downturn on employment levels in Australia was much more muted and both employment and apprentice and trainee numbers have returned to the pre-downturn level. This report examines the effect of the downturn on apprentices and trainees as well as investigating the relationship between apprentice and trainee numbers and the level of employment.

Key messages

- At the broad level, apprentice and trainee commencements are sensitive to changes in total employment.
- Changes to apprentice and trainee commencements precede changes in total trades employment by four quarters. Changes to trainee commencements appear to lag behind changes in employment in non-trade occupations but the relationship is not nearly as strong as for the trade occupations.
- When examined at the two-digit occupational level, the relationship between apprentice and trainee commencements and occupational employment is strong in trade occupations but not apparent in non-trade occupations.
- During the downturn, cross-sectional completion rates increased and cancellations and withdrawals from apprenticeships and traineeships decreased, although the size of the decrease was larger in the non-trade occupations.
- Of those apprentices and trainees who do not complete, a much higher proportion has discontinued their training because they lost their job or were made redundant. This was especially so in the trades occupations. Even so, the impact of the increase in redundancies is offset by a decline in apprentices and trainees leaving their job.
- Consequently, the short-lived downturn had only a very small impact on the supply of tradespeople.

Tom Karmel
Managing Director, NCVER

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Introduction

The economic downturn of 2008 had an immediate and dramatic effect on the number of apprentice and trainee commencements in Australia, even though the country technically avoided recession and the impact on employment was not as severe as had been anticipated. Previous experience has shown that trade apprentices are closely linked to the economic cycle (Kapuscinski 2001), although the patterns have differed by trade (Karmel & Mlotkowski 2008). However, we have virtually no experience with regard to the economic cycle and traineeships, for the simple reason that traineeships were numerically small until the middle 1990s. Karmel and Misko (2009) argued that the relationship would be different by comparison with trade apprentices, but their paper was written prior to the availability of relevant data.

In this paper, we examine the impact of the 2008—09 economic downturn on apprentices and trainees. We combine data from the National Apprentice and Trainee Collection with the 2008 and 2010 Apprentice and Trainee Destinations Surveys. The 2008 survey sampled apprentices and trainees who exited their training in the December 2007 quarter, and interviewed them approximately nine months after they had left their training, between September and November 2008. The 2010 survey sampled apprentices and trainees who exited their training in the June quarter 2009, and interviewed them approximately nine months after they had left their training, between March and May 2010.

The timing of the two surveys provides an excellent opportunity to analyse behaviours and outcomes for apprentices and trainees at contrasting points of the economic cycle.

To investigate the impact of the economic climate on apprentices and trainees we address the following:

- the impact on commencements, in terms of both the numbers and characteristics of those entering the system
- the impact on the rate of completion and the duration of training
- the impact on non-completion, particularly reasons for leaving
- outcomes for out-of-trade apprentices during the downturn.

To put the recent downturn in context, we examine the relationship between commencements and change in employment since 1995 for the trades and since 2004 for the non-trades. We find that the number of apprentice commencements is associated with the level of trades employment four quarters later; that is, apprentice commencements led changes in trades employment by four quarters. For the non-trades we find that trainee commencements reflect changes in non-trades employment over the preceding five quarters.

We hypothesise that, when examined at the detailed occupational level, changes in apprentice and trainee commencements will be linked to changes in employment over the corresponding lead or lag period and to the profile of apprentices and trainees in each occupation, such as average duration of the apprenticeship or traineeship and the proportion of apprentices or trainees who are existing workers. However, we are unable to identify a convincing model to account for the dramatic change in apprentice and trainee commencements on the basis of changes to employment and the differing characteristics of apprenticeships and traineeships by occupation. Ultimately, employers anticipated

a more severe downturn than actually occurred. It would seem that 'animal spirits' play a large role in employers' hiring behaviour.

We find that the downturn was associated with an across-the-board increase in completion rates and a decrease in attrition rates. This effect was stronger for the non-trade occupations than for the trade occupations.

Not surprisingly, there was a sharp increase in the number of out-of-trade apprentices during the downturn. We focus on the outcomes for out-of-trade apprentices in trade occupations, since the longer duration of traditional apprenticeships represents a greater loss on investment. Out-of-trade apprentices are less likely to be employed than apprentices who did not complete their training for other reasons. We also find that most out-of-trade apprentices have not resumed another apprenticeship within nine months of their being made redundant. Comparison with outcomes for apprentices made redundant in 2008 shows that jurisdictions struggled to increase the proportion of out-of-trade apprentices who were able to resume their apprenticeship. Thus the apprentices made redundant represent a real loss to the supply of qualified trade workers. However, overall completion rates did not fall during the downturn and the loss to the system from out-of-trade apprentices is not as great as the decline in apprentice commencements.

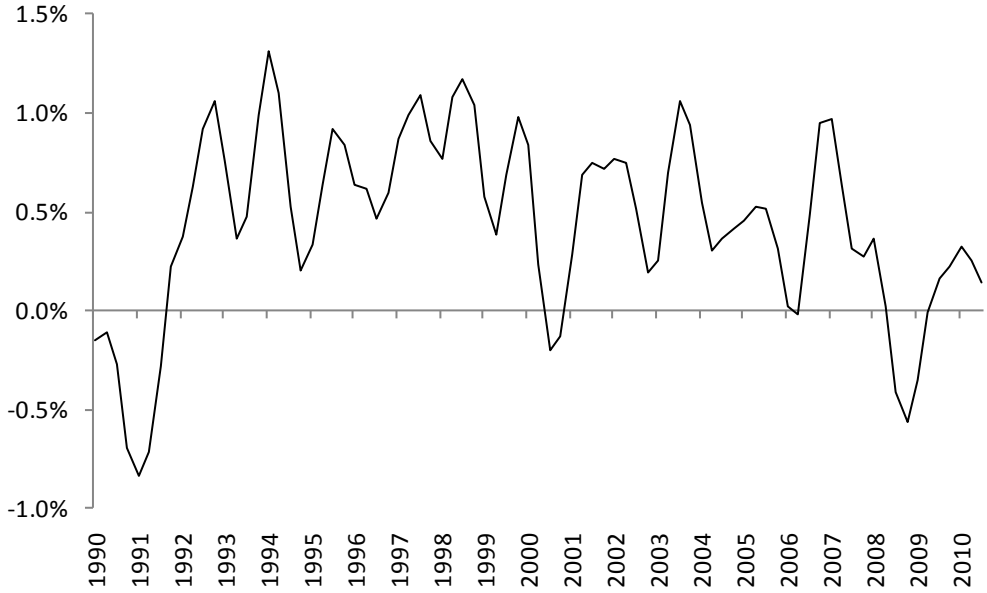
In just six quarters, apprentice commencements had returned to their pre-downturn level. The comparatively mild downturn did not damage the training system's capacity and the decline in commencements will have only a minor flow-on effect to the supply of skilled trade workers.

We begin the paper with a brief discussion of the 2008 downturn. This is followed by a discussion, in turn, of commencements, completions and cancellations and withdrawals. The paper ends with some final comments.

The 2008 downturn

In 2008, the Global Financial Crisis (GFC) resulted in an economic downturn in Australia. Technically, the nation avoided recession as there were not two successive quarters of negative economic growth but the downturn nonetheless represented the most severe interruption to economic activity for nearly 15 years. Figure 1 shows the percentage change in per capita quarterly gross domestic product (GDP). Using per capita figures adjusts for the strong population growth the country has experienced recently relative to earlier periods. From figure 1, it can be seen that the economic downturn comprised three quarters of negative GDP per capita growth, beginning in September 2008. In magnitude and duration, the 2008 downturn exceeded the 2000 downturn but was not as severe as the 1990 recession.

Figure 1 Percentage change in per capita GDP



Source: ABS (2010a, table 1).

The decline in per capita GDP coincided with a decline in apprentice and trainee commencements. In the third quarter of 2008, total commencements declined by 2.3% on a seasonally adjusted basis. As shown in figure 2 and table 1, the decline in commencements among trade occupations (-6.1%) was much larger than among non-trade occupations (-0.6%). Apprentice and trainee commencements, like per capita GDP, declined for three quarters. It would be six quarters (in March quarter 2010) before the number of commencements returned to their pre-downturn level.

Figure 2 Seasonally adjusted commencements, trade and non-trade

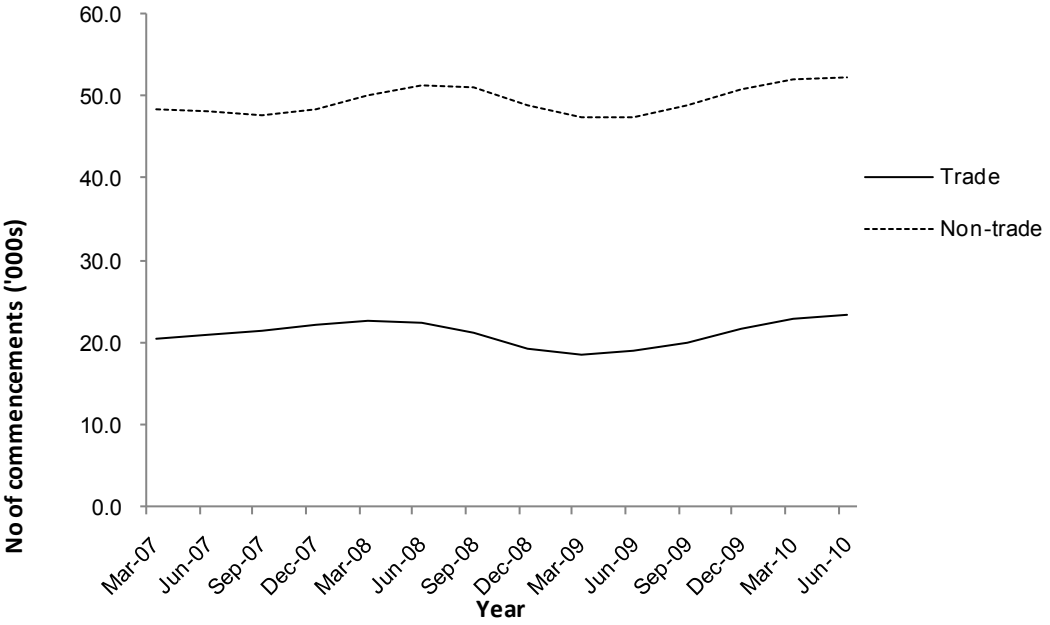


Table 1 Seasonally adjusted apprentice and trainee commencements and percentage change on previous quarter, trade and non-trade, 2007—10 ('000s)

Quarter	Commencements ('000s)			% change in commencements on previous quarter		
	Trade	Non-trade	Total	Trade	Non-trade	Total
March 2007	20.6	48.3	68.9	3.3	1.7	2.2
June 2007	21.0	48.1	69.1	2.1	-0.5	0.3
September 2007	21.3	47.6	68.9	1.5	-1.0	-0.3
December 2007	22.1	48.3	70.4	3.6	1.6	2.3
March 2008	22.8	50.1	72.8	2.9	3.6	3.4
June 2008	22.5	51.3	73.8	-1.2	2.4	1.3
September 2008	21.1	51.0	72.1	-6.1	-0.6	-2.3
December 2008	19.3	48.9	68.3	-8.5	-4.0	-5.3
March 2009	18.4	47.3	65.7	-4.8	-3.4	-3.8
June 2009	18.9	47.4	66.3	2.6	0.2	0.9
September 2009	20.1	48.8	68.8	6.2	2.9	3.9
December 2009	21.7	50.7	72.4	8.0	4.0	5.2
March 2010	23.0	52.0	74.9	6.0	2.4	3.5
June 2010	23.5	52.2	75.7	2.2	0.4	1.0

Source: NCVER Apprentice and Trainee Collection, June 2010.

For the purposes of this report, we have adopted the convention that the downturn covers the period in which commencements declined and finishes when they had returned to historical levels (that is, 2008, quarter 3 through to 2009, quarter 4). Our comparison is the period immediately before the downturn. To preserve seasonality, the comparison period is 2007, quarter 3 through to 2008, quarter 2, with the first two quarters counted twice to preserve seasonal balance. Tables 2 and 3 show the impact of the downturn on commencements in trade and non-trade occupations respectively. The

largest declines were in the trade occupations, particularly automotive and engineering trades workers, construction trades workers, and electrotechnology and telecommunications trades workers.

Table 2 Impact of downturn on apprentice commencements

	Comparison period	Downturn period	Change
	'000	'000	%
31 Engineering, ICT and science technicians	4.8	5.2	7.8
32 Automotive and engineering	31.5	24.1	-23.5
33 Construction trades workers	33.9	25.1	-25.9
34 Electrotechnology and telecommunications trades workers	16.9	13.5	-20.5
35 Food trades workers	14.8	14.1	-4.5
36 Skilled animal and horticultural workers	5.9	6.0	1.6
39 Other technicians and trades workers	17.0	21.7	27.4
391 Hairdressers	8.9	8.0	-9.7
392 Printing trades workers	0.9	0.9	5.7
393 Textile, clothing and footwear trades workers	0.3	0.2	-32.8
394 Wood trades workers	3.2	2.2	-30.8
399 Miscellaneous	3.8	10.4	172.0
3 Technicians and trades workers	**124.8**	**109.6**	**-12.2**

Source: NCVER Apprentice and Trainee Collection, June 2010.

Table 3 Impact of downturn on trainee commencements

	Comparison period	Downturn period	Change (%)
Managers and professionals	16.0	12.6	-21.7
Community and personal service workers	61.5	62.9	2.2
Clerical and administrative workers	76.1	79.4	4.4
Sales workers	60.5	60.6	0.2
Machinery operators and drivers	39.2	35.6	-9.2
Labourers	35.7	35.2	-1.4
Total (non-trades)	**289.0**	**286.2**	**-1.0**

Source: NCVER Apprentice and Trainee Collection, June 2010.

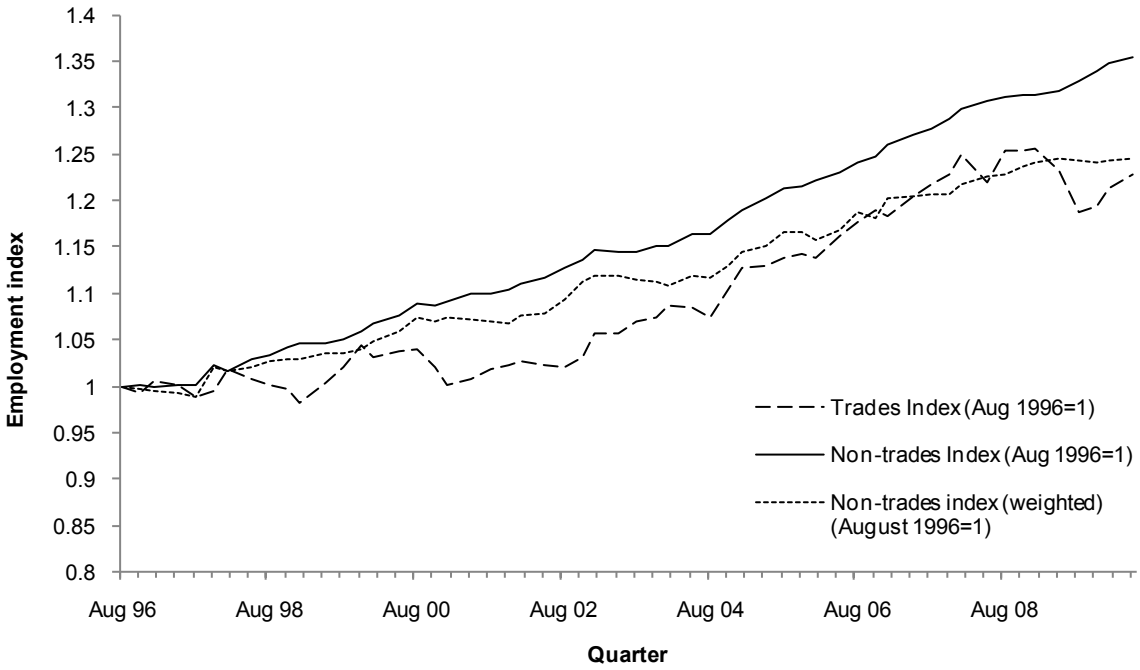
In contrast to the dramatic impact of the downturn on apprenticeship commencements, the effect on employment was much more muted than anticipated. Treasury (2009) had predicted that the unemployment rate would peak at 8.5%, even taking into account the effect of the government's stimulus measures. In the end, however, the unemployment rate reached only 5.8% in June—August 2009.

In figure 3, we show the quarter-on-quarter percentage change in seasonally adjusted employment for trade and non-trade occupations between 1996 and 2010 as an index, with August 1996 as the base.[1] Employment in trade occupations decreased by 3.6% in the second quarter of 2009 and by a further 5.5% in the following quarter. Traineeships provide training for a variety of non-trade occupations but are predominantly for occupations in the clerical, sales, and personal and community services major categories, followed by machinery operators and drivers and labourers. Few traineeships provide training for managerial occupations and there are even fewer for professional occupations, yet these

[1] We use August 1996 as the base because this is the beginning of the current ANZSCO (Australian and New Zealand Standard Classification of Occupations) series.

are the non-trade occupational categories which have experienced the strongest employment growth over the last 15 years. We have therefore constructed a trainee-weighted non-trade employment figure by adjusting each major category to reflect its proportion of the overall number of traineeships and then summing the categories.[2] In the 2008—09 downturn, weighted employment in non-trade occupations decreased in the last three quarters of 2009 by 0.1% — a much milder impact than experienced by trade employment but more severe than the unadjusted non-trade employment. In the next section, we consider the extent to which the decline in apprentice and trainee commencements can be explained by economic factors, in particular, employment.

Figure 3 Indexed change in employment in trade and non-trade occupations, 1996—2010



Source: ABS (2003, 2010b); NCVER Apprentice and Trainee Collection, June 2010.

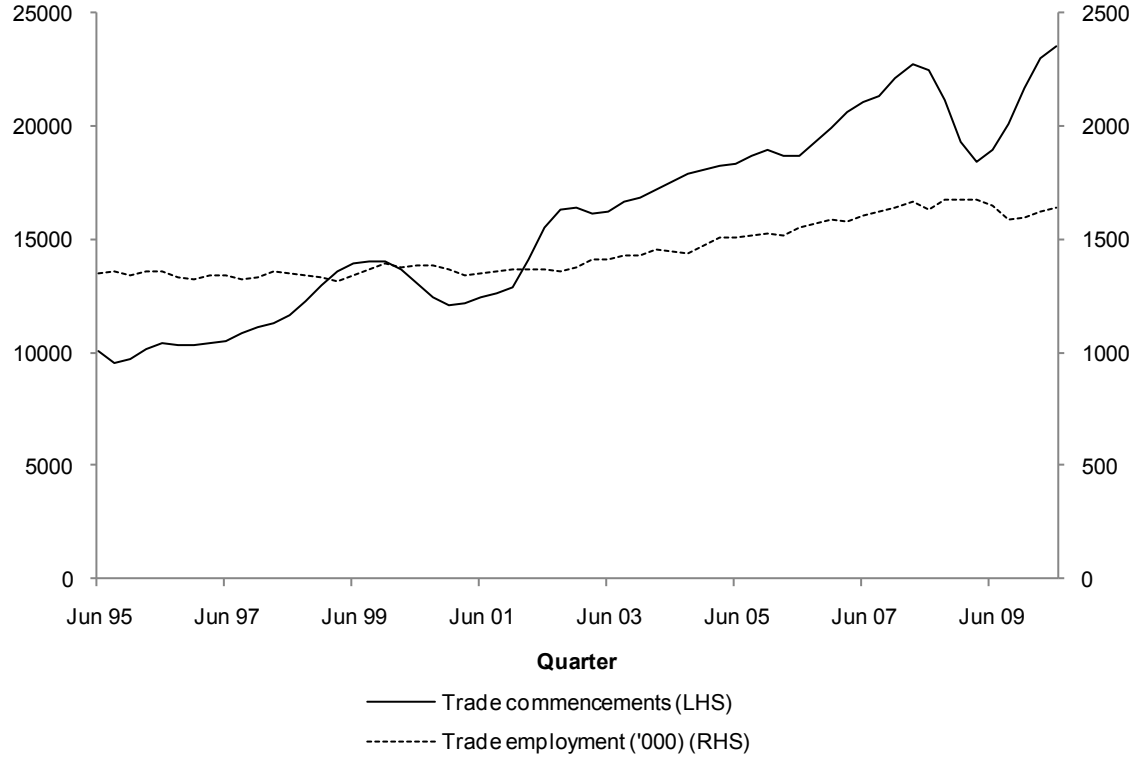
[2] The weight is calculated using the average proportion of trainee commencements for each non-trade occupational category over the period Q42003—Q32010 (i.e. quarter 4, 2003 to quarter 3, 2010). Non-trade commencements stabilised from 2004 onward (see figure 5) and Q42003 was included to maintain seasonality.

Impact of the labour market on commencements

In previous recessions, sharp decreases in the number of apprenticeship commencements have been followed by decreases in employment. The decline in trade commencements during the 2008—09 downturn is consistent with previous economic downturns in Australia, especially the 1992 recession (Karmel & Misko 2009). Since 1992, the profile of those in training has changed, with traineeships in non-trade occupations becoming much more widespread.

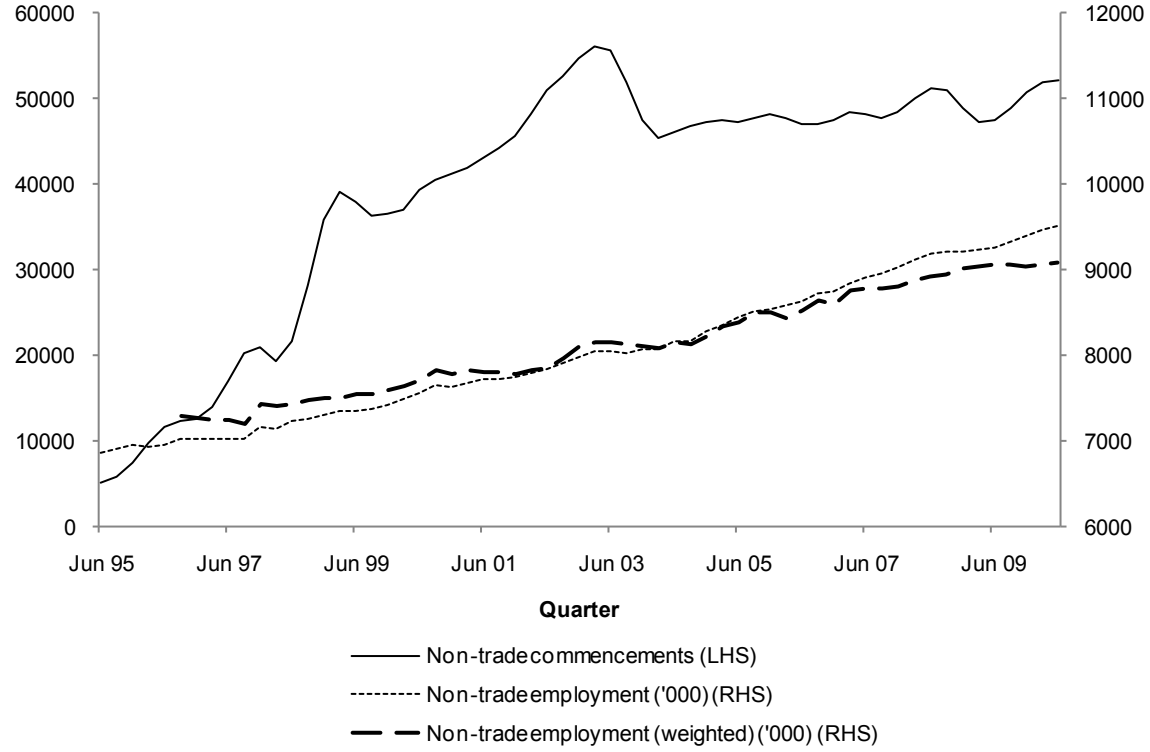
We are interested in better understanding the relationship between apprenticeship and traineeship commencements and employment. We begin by representing quarterly seasonally adjusted commencement and employment data for the trades (figure 4) and the non-trades (figure 5). Our data series begins in 1995, the earliest point for which quarterly seasonally adjusted commencement data are available.

Figure 4 Apprenticeship commencements and total employment in trade occupations (seasonally adjusted), June 1995 — June 2010



Source: ABS (2003, 2010b); NCVER Apprentice and Trainee Collection, June 2010.

Figure 5 Traineeship commencements and total employment in non-trade occupations (seasonally adjusted), June 1995 – June 2010



Source: ABS (2003, 2010b); NCVER Apprentice and Trainee Collection, June 2010.

Looking at the graphs (figures 4 and 5), it appears that changes in apprenticeship commencements generally precede changes in trades employment by between two and five quarters, whereas changes in traineeship commencements and non-trades employment occur more or less simultaneously. The relationship for the non-trades is also affected by the very strong growth in the number of traineeship commencements between 1998 and 2004, which clearly outstripped growth in non-trades employment. In figure 4, it is clear that during the most recent downturn apprenticeship commencements were at their lowest in the first quarter of 2009, whereas trades employment reached its lowest point in the third quarter of 2009. In another example, at the beginning of the series, apprenticeship commencements troughed in the third quarter of 1995, but trades employment bottomed in the second quarter of 1996. After the 2001 slowdown, trades commencements peaked in the fourth quarter of 2002 before declining for another two quarters. Trades employment would not reach its corresponding peak until the first quarter of 2004. The impact of the 2008 downturn on traineeships is harder to discern, because in the quarterly series non-trades employment did not decline. However, in earlier cycles the employment and commencement trends appear to move more closely together. For example, the peak in traineeship commencements in the first quarter of 2003 coincided with a peak in non-trades employment.

Logically this makes some sense. Apprenticeships in trade occupations are typically of three or four years duration. Employers making a decision about whether to employ an apprentice are likely to take into account the economic conditions over the following years. Traineeships are shorter, usually lasting less than two years. In addition, legislation in some states gives employers more latitude to terminate a trainee than an apprentice. Employers of trainees therefore do not need to be so concerned about the long-range economic conditions, since they are only committing to a contract of one or two years duration, which in any case they may be able to terminate with deteriorating conditions.

However, we need a more rigorous method of identifying the lead or lag effect between apprenticeship and traineeship commencements and employment. We explain our approach by starting first with a straightforward model assuming that the number of commencements at time t is a function of commencements in the previous quarter (t-1) and total employment in trades occupations at time t.

This gives an equation of the form:

$$C_t = \rho C_{t-1} + \beta E_t + e$$

If we assume a steady state of employment, we can rearrange the equation

$$C_t = \left[\frac{\beta}{1-\rho}\right] E_t + e$$

and derive the training commencement rate $\left[\frac{\beta}{1-\rho}\right]$. We perform an ordinary least squares regression, using quarterly seasonally adjusted data from the third quarter of 1995 to the second quarter of 2010. To maximise the number of observations available, we use state-level data. Table 4 shows the results for this model. The model suggests a training commencement rate of 15.3 apprentice commencements per 1000 employees per quarter.

Table 4 Regression of apprenticeship commencements on trade employment

Model	variable	Parameter estimate	Standard error	t value
A.	Commencements trade (t-1)	0.981	0.010	100.01
	Employment trade (t) ('000s)	0.284	0.107	2.64
	R-Square	0.9980		
	No of observations	440		

Source: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

To explore the impact of a previous or future change in employment, we introduce into the model a difference term. The difference term for the lag periods is conceptually straightforward and is simply $E_t - E_{t-i}$. Our initial analysis suggested that there may be an asymmetric relationship between employment and commencements; namely, that the number of commencements responds more strongly to a decrease in employment than a similarly sized increase in employment. We therefore created two difference terms, one where the change in employment was positive and one where the change in employment was negative.

This gives us the model:

$$C_t = \rho C_{t-1} + \beta_1 E_t + \beta_2 |E_t - Et_{-i}|^{+} + \beta_3 |E_t - Et_{-i}|^{-} + e$$

Where $|E^t - E_i|^{+}$ is a positive change in employment between period i and period t and $|E^t - E_i|$ is a negative change in employment between period i and period t. We test up to eight quarters before t.

Whereas a lag effect suggests that prospective employers and employees are responding to a known change in employment, at any given point of time prospective employers and prospective apprentices do not know what the future employment level will be. They only have expectations of how the employment level will change into the future. Because we have no data on expectations, we have little choice but to assume that they are rational and that, on average, people's expectations about the future level of employment are correct.

The lead terms are therefore calculated as E_{t+i} – E:

$$C_t = \rho C_{t-1} + \beta_1 E_t + \beta_2 |E_{t+i} - E_t|^+ + \beta_3 |E_{t+i} - E_t|^- + e$$

Finally, because it seems that apprenticeship and traineeship commencements are much more sensitive to changes in economic conditions than employment (at least in the period under examination), we also include a quadratic term for both positive and negative changes in employment, so that a small change in employment might lead to a small change in commencements, but a large change in employment leads to a very large change in commencements. Thus, we arrive at a model:

$$C_t = \rho C_{t-1} + \beta_1 E_t + \beta_2 |E_{t\pm i} - E_t|^+ + \beta_3 |E_{t\pm i} - E_t|^- + \beta_4 (|E_{t\pm i} - E_t|^+)^2 + \beta_3 (|E_{t\pm i} - E_t|^-)^2 + e$$

We test the effect of a future change in employment up to eight quarters after t. Using this straightforward approach, we can find the lag that provides the best for the data, with the lowest residual sum of squares. The inclusion of the quadratic terms is tested using a partial F-test.

All the lag models to t-8 and the lead models to t+8 are presented in appendix A. Since the models have the same number of parameters and we have ensured that all models use the same number of observations, we can directly compare their performance using the R^2 coefficient. All the lag and lead models offer a very slight improvement over the original model. The model with the greatest improvement is the one using employment at time t+4. This conforms to our initial conjecture when examining figure 4. It suggests that apprentice commencements at any given time take into account expectations of the demand for trades employment in 12 months time, with an expected decline in trades employment having a larger effect than an expected increase in trades employment of the same magnitude. An F-test confirms that the quadratic terms are significant. The coefficients for this model are shown in table 5. As a verification of the model, we run the analysis again, using Australia-wide data (data not shown) rather than state-level quarterly data. Using this approach, $C_t = \rho C_{t-1} + \beta_1 E_t + \beta_2 |E_{t+i} - E_t|^+ + \beta_3 |E_{t+i} - E_t|^- + e$ is again the model that explains the most variance.

If we assume a steady state of employment,[3] this produces a commencement rate of 13.0 apprentices per 1000 trade employees per quarter.

Table 5 Regression of apprenticeship commencements against employment and change in employment terms

Variable	Parameter estimate	Standard error	T Value
Commencements trade (t-1)	0.968	0.009	103.63
Employment trade Et (000s)	0.417	0.101	4.12
Positive change in trade employment Et+4 -E t (000s)	3.243	1.707	1.90
Negative change in trade employment Et+4 -E t (000s)	-0.924	2.37	-0.39
Square of positive change in trade employment Et+4 -Et (000s)	-0.008	0.044	-0.18
Square of negative change in trade employment Et+4 -Et (000s)	-0.189	0.077	-2.45
R Square	0.9983		
No of observations	440		

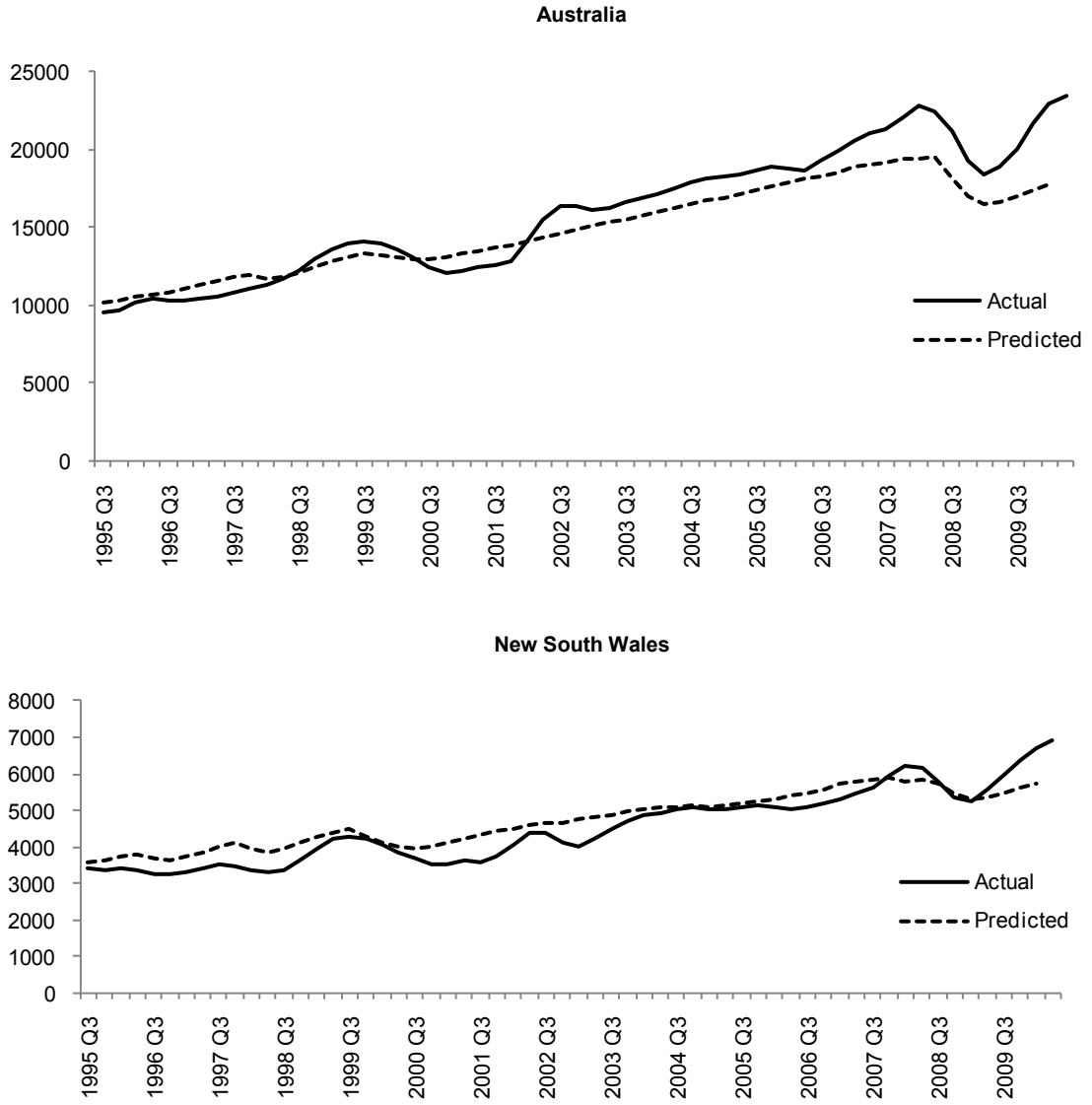
Source: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

[3] i.e., $E_{t+} - E_t = 0$

Using the results from this model we compare actual commencements with predicted values, shown in figure 6. The predictions are dynamic with the prediction of commencements used as the lagged value in the next quarter.[4]

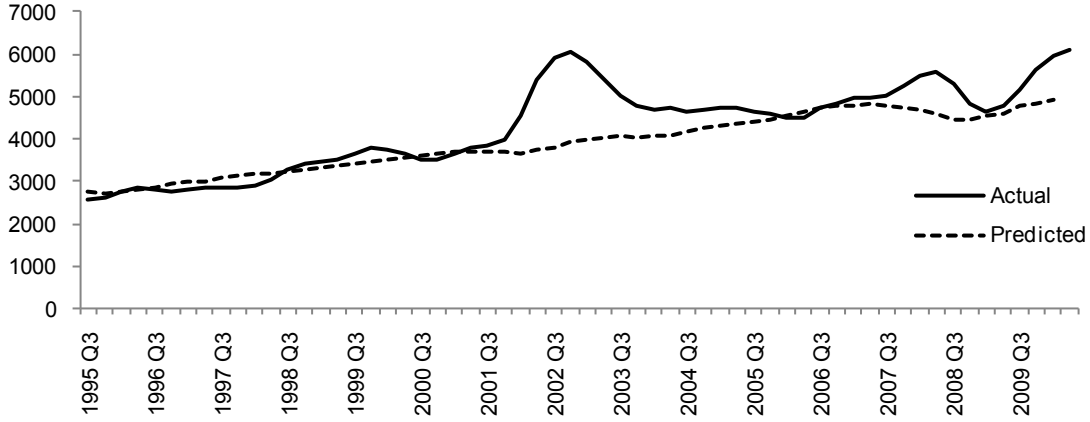
Our model typically underestimates the extent of the decline. When the model is used to predict commencements at the national level, it does show the extent of the downturn in commencements in 2008 but from a lower peak in 2008. At a state level the results are more mixed. Notably, the model predicts very little interruption to commencements in Western Australia, whereas in reality a sharp decline was experienced. Further, the model does not account for the peak in commencements immediately preceding the downturn that occurred nationally and in most states.

Figure 6 Actual vs predicted commencements in apprenticeships, 1995—2010

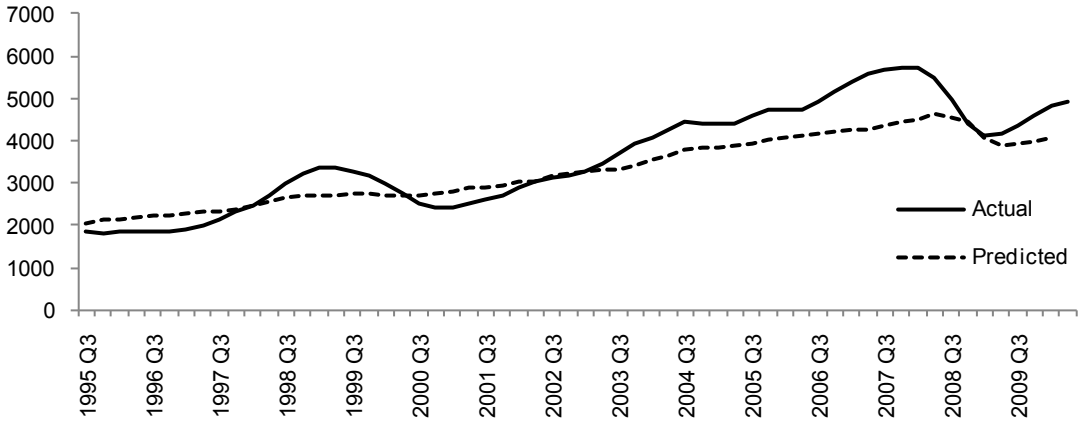


[4] The first predicted value of the series, Q31995, is predicted using the actual number of commencements in Q21995.

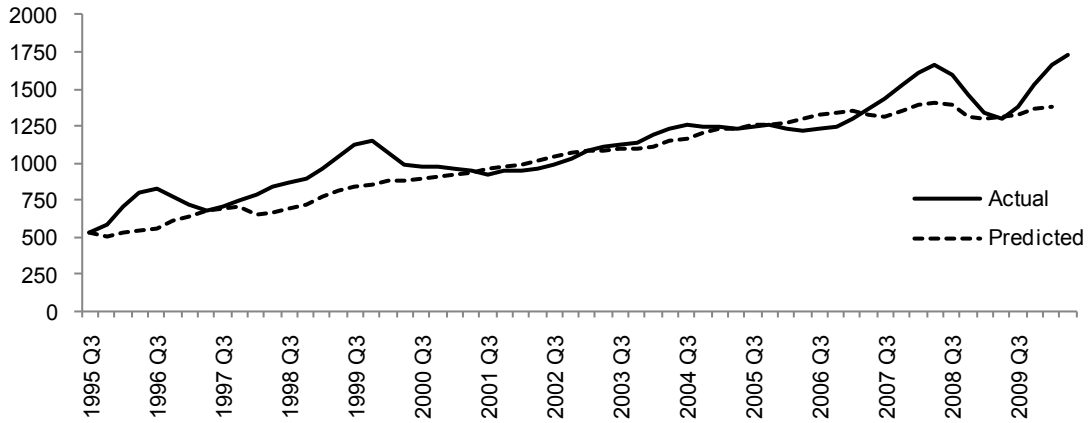
Victoria



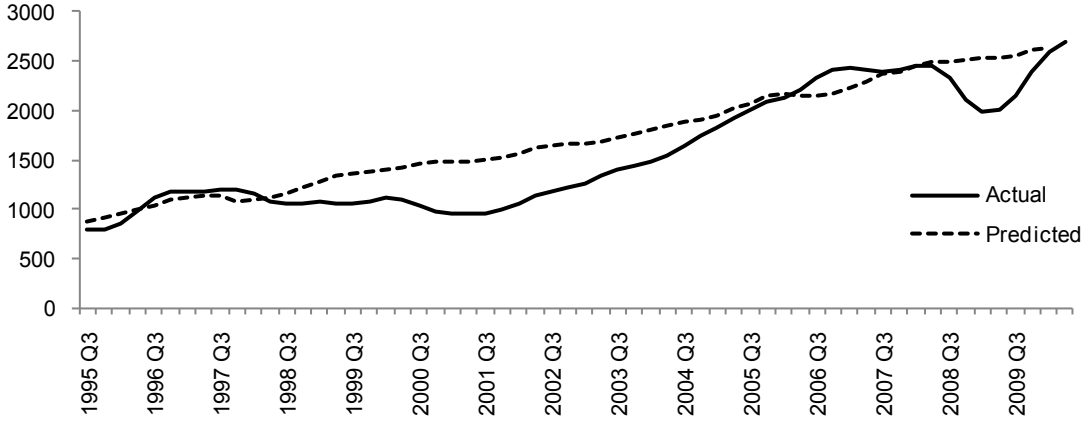
Queensland



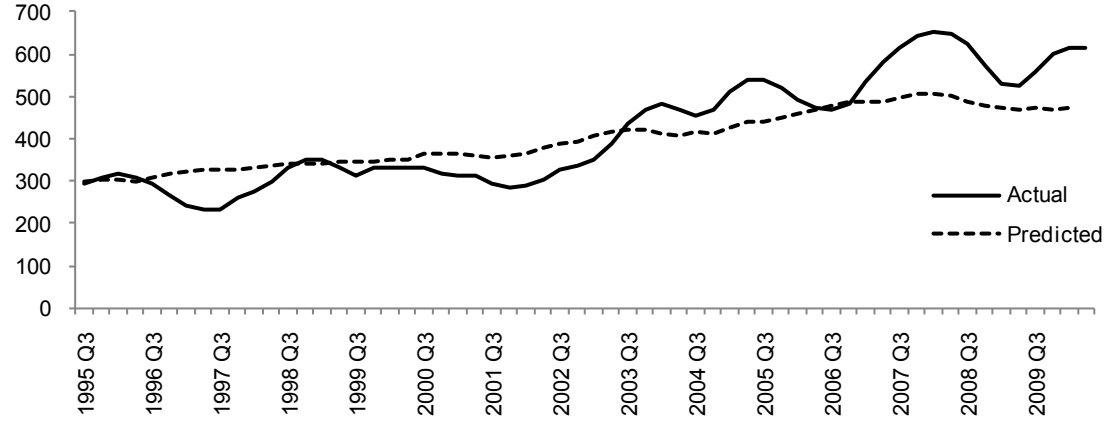
South Australia



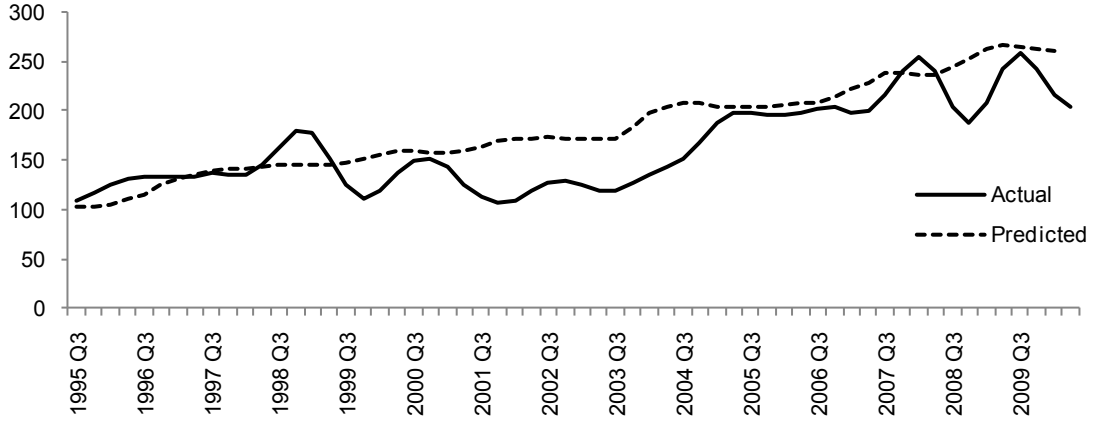
Western Australia

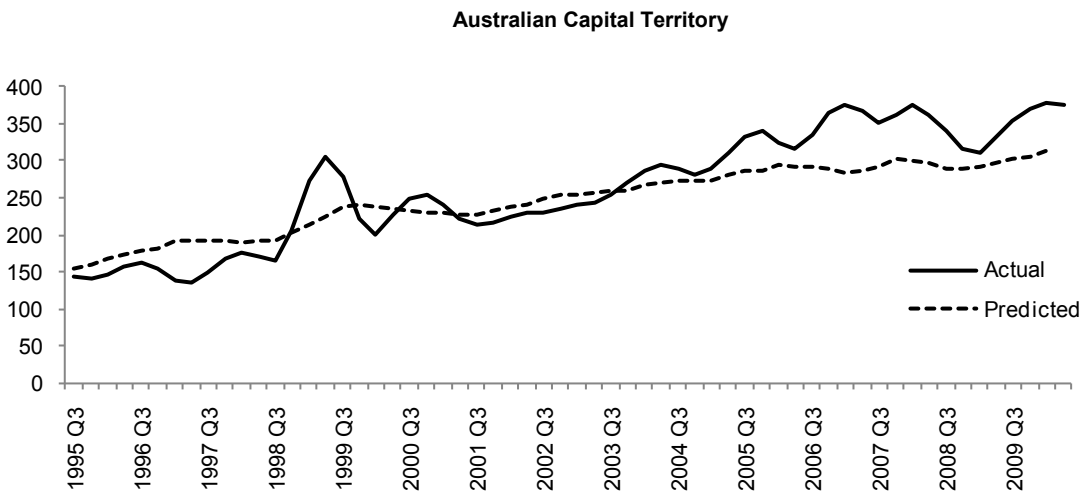


Tasmania



Northern Territory





Source: Generated from ABS (2003, 2010b) and NCVER Apprentice and Trainee Collection, June 2010.

We repeat the exercise, this time looking at traineeship commencements and employment in non-trade occupations. Modelling commencements in traineeships between 1995 and 2010 is more challenging than modelling apprenticeship commencements, because, as figure 5 demonstrates, the traineeship system experienced exponential growth between 1995 and 2003 as the range of traineeship occupations expanded and the incentives to employ trainees increased. From 2004 onward, the number of traineeship commencements fluctuated within a much smaller range.

We therefore restrict our analysis to the period 2004—10. Once again we pool the state-level data so that we have sufficient observations to restrict the analysis to the more recent period after traineeship commencements stabilised. As before, we weight the non-trade employment data to reflect the proportion of trainees in each occupational category, using the average proportion between the third quarter 2003 and the second quarter 2010. This means that changes in the employment level of managers and professionals, which have proportionately fewer trainees than the other categories, will be de-emphasised. We set the first quarter of 2004 as the base for this weighted series.

Table 6 shows the results for this model. The model suggests a training commencement rate of 5.6 trainee commencements per 1000 non-trade employees per quarter. As would be expected, this is well below the rate for apprentices.

Table 6 Regression of traineeship commencements on trade employment

Variable	Parameter estimate	Standard error	t value
Commencements traineeships (t-1)	0.957	0.018	53.58
Employment non-trade (t) ('000s)	0.239	0.101	2.37
R-Square	0.9987		
No. of observations	168		

Source: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

We then introduce difference terms into the model to capture more of the dynamics in the employment situation. We test the same range of lag and lead terms as for trade apprentices. All the models are summarised in appendix A.

The model that shows the greatest improvement over the basic $C_t = \rho C_{t-1} + \beta E_t + e$ model is the quadratic model using the t-4 lag. However, in none of the models are the coefficients for the quadratic terms significant, and an F-test shows that the quadratic model is not significantly better than the t-4 model with only the difference terms. Further, the t-4 model includes a coefficient with an unexpected sign: it shows a negative relationship between a positive change in non-trade employment and traineeship commencements. Therefore, we look to select the best non-quadratic model that has coefficients with expected signs. This is the model using the five-quarter lag, which we have shown in table 7.[5]

Table 7 Regression of traineeship commencements on lagged commencement, employment in non-trade occupations and change in non-trade employment at the state and territory level, 2005—10

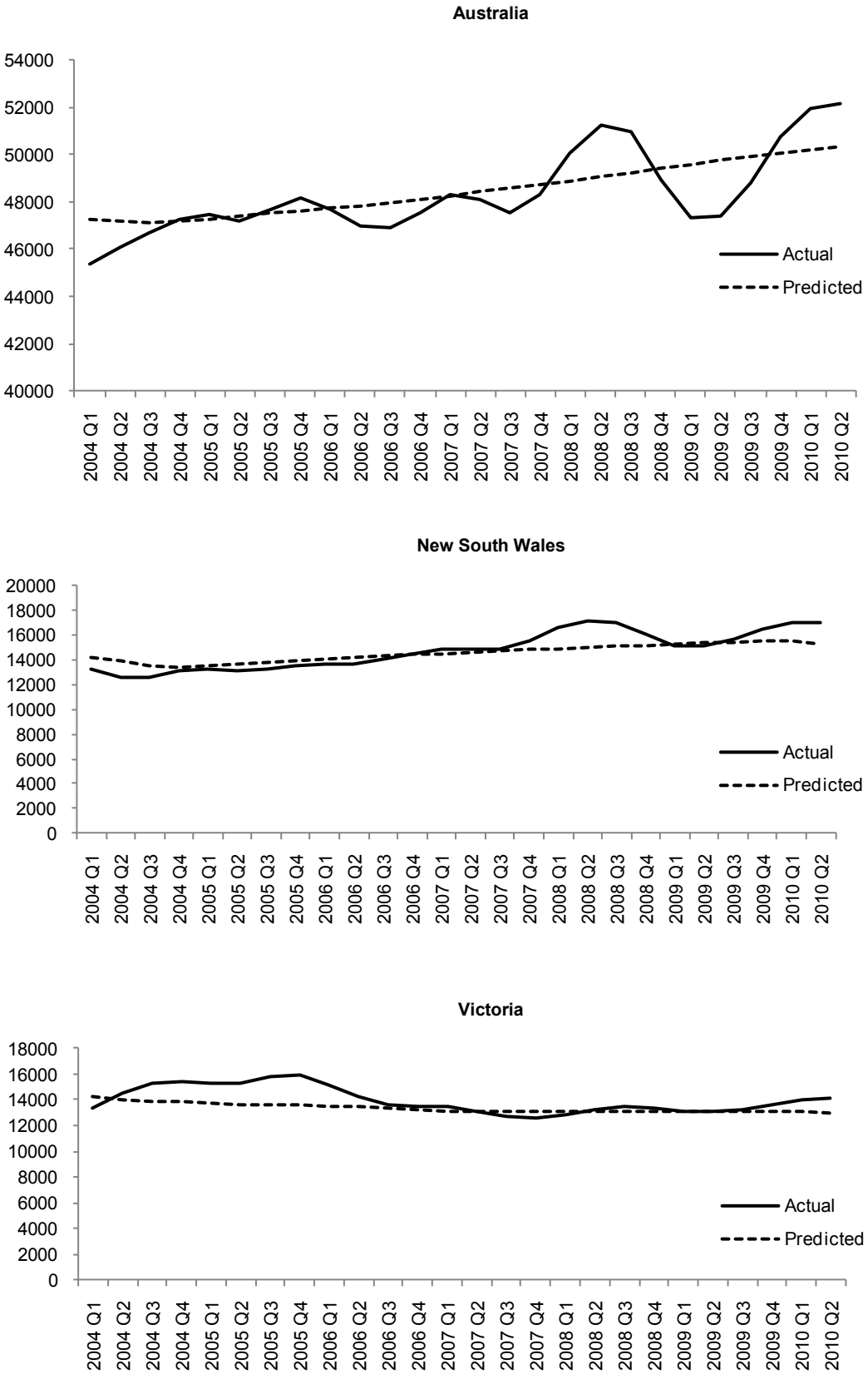
Variable	Parameter estimate	Standard error	t Value
Commencements non-trade (t-1)	0.950	0.018	0.000
Employment non-trade E_t ('000)	0.291	0.104	0.006
Positive change in non-trade employment (weighted) E_t-E_{t-5} ('000s)	0.075	0.934	0.936
Negative change in non-trade employment (weighted) E_t -E_{t-5} ('000s)	-6.044	2.42	0.013
R-Square	0.9988		
No of observations	168		

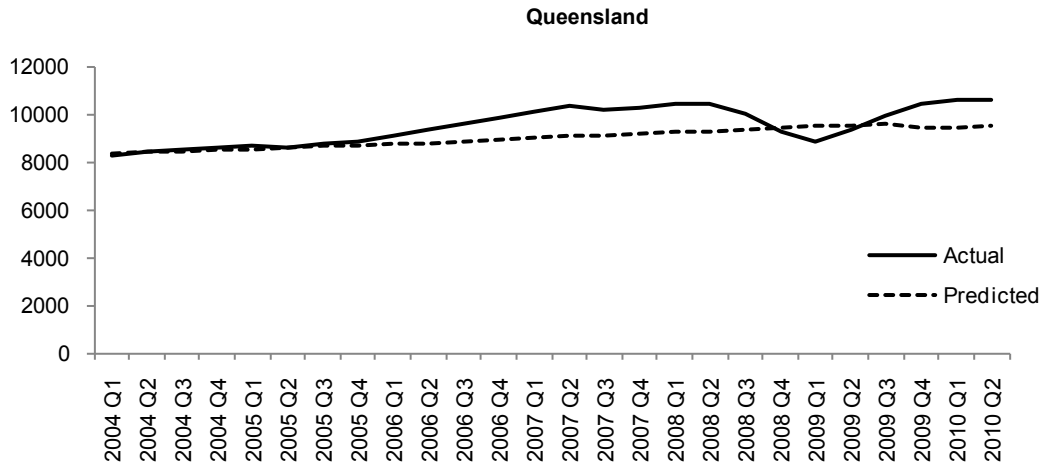
Source: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

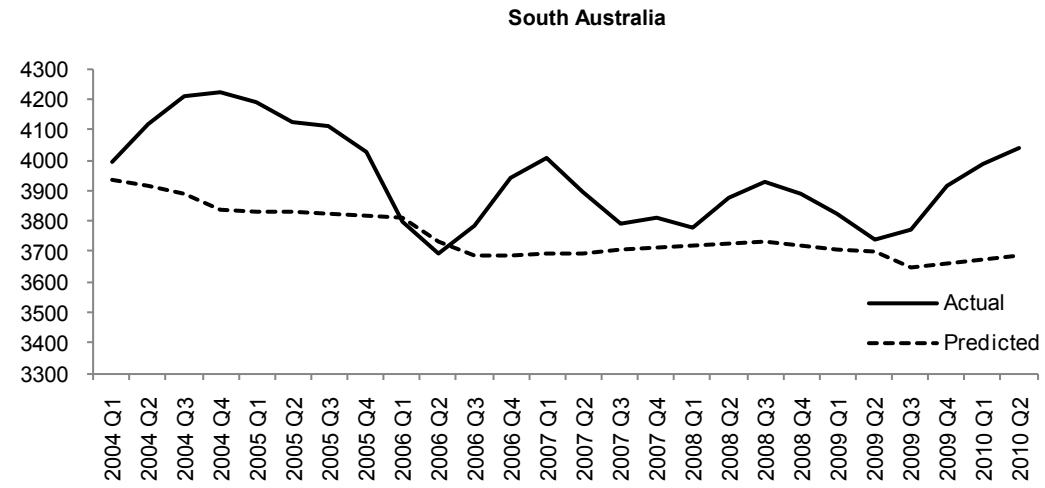
Figure 7 depicts how well this model does at predicting the change in commencements. Clearly, we are not able to predict non-trade commencements using employment in non-trade occupations as well as we were for apprentices. This is mostly attributable to the relatively constant growth in non-trade employment, even after weighting to take account of the distribution of traineeships. During the recent downturn there was not a single five-quarter period where non-trades employment declined Australia-wide, even though there were declines at the state level, since the state-level declines occurred at different times.

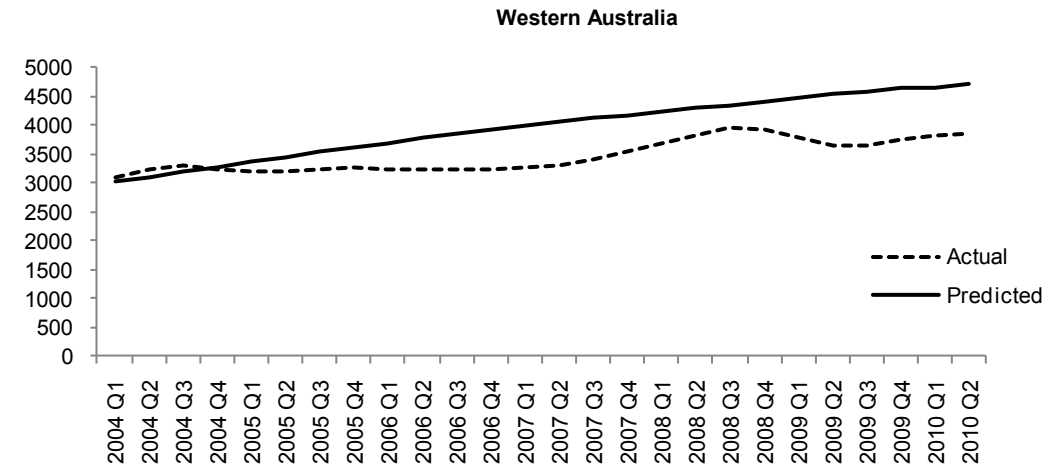
[5] A partial F test confirms that the quadratic model for the five-quarter lag is not significantly better than the model without the quadratic terms.

Figure 7 Actual and predicted commencements in traineeships, 2004—2010



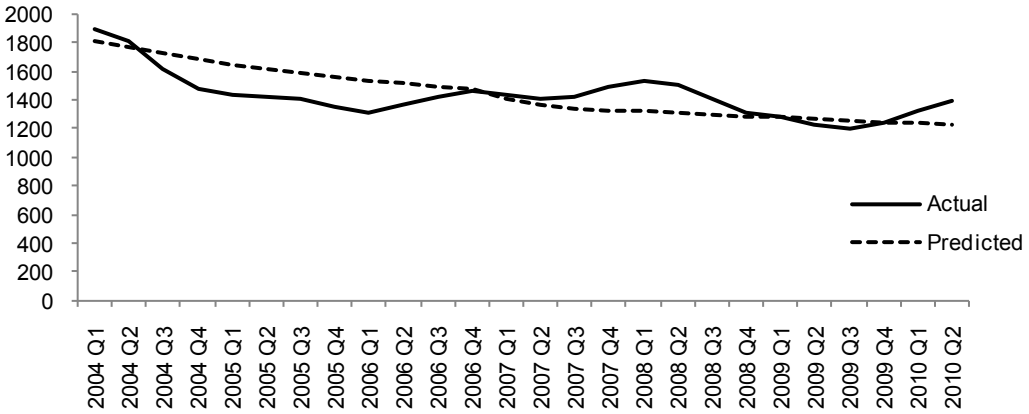




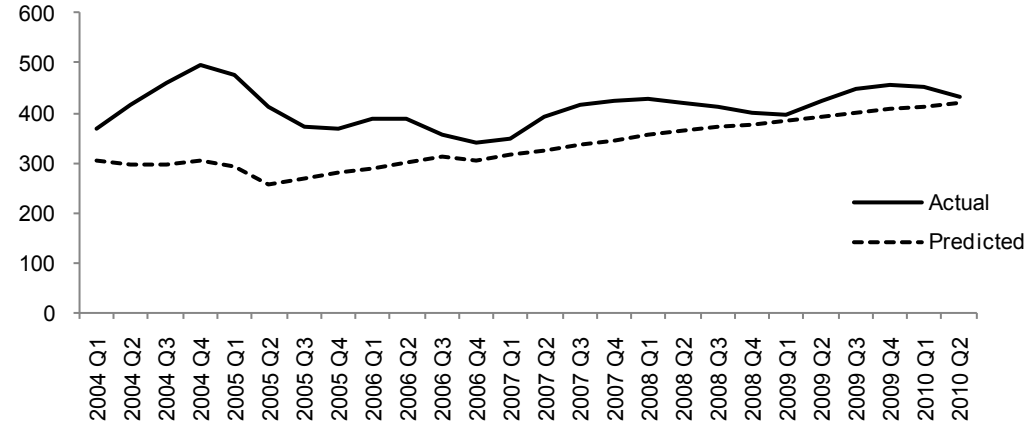


Source Generated from ABS (2003, 2010b) and NCVER Apprentice and Trainee Collection, June 2010.

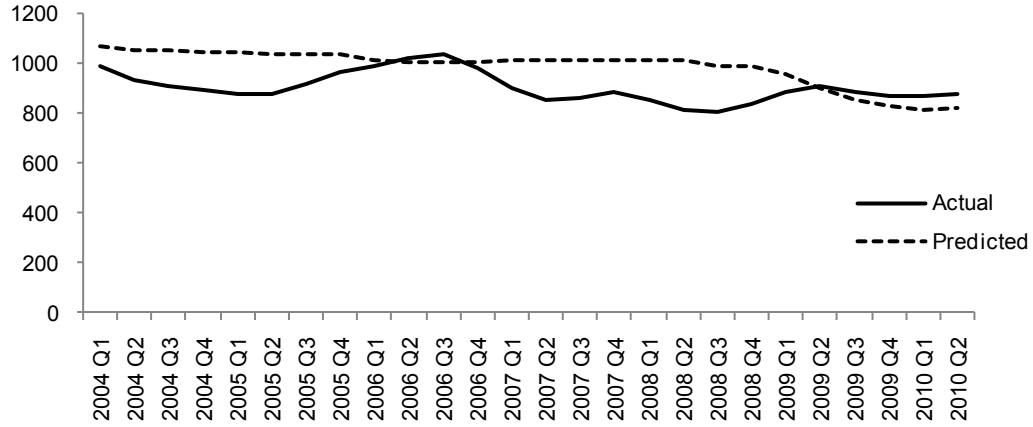
Tasmania



Northern Territory



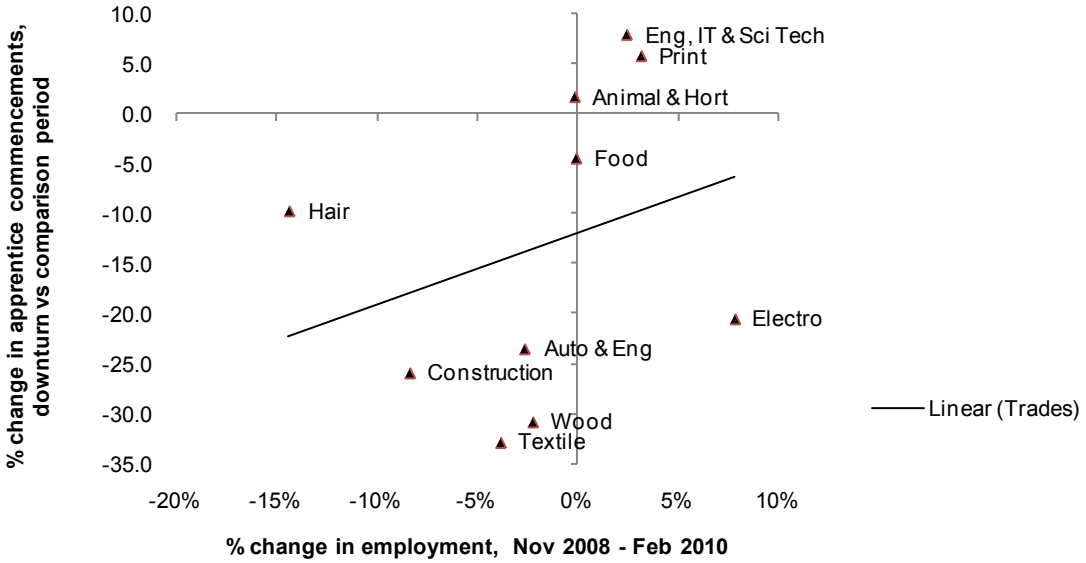
Australian Capital Territory



Now we move from the aggregate level to the occupational level for commencements and employment. Initially we examined the aggregate level because it is difficult to generate reliable seasonally adjusted data at the more detailed occupational level. However, we make use of the dynamics we observed at the aggregate level. Because the results of the previous section suggest there are different employment effects for the trades and the non-trades, we plot them separately. For the change in apprenticeships and traineeships, the downturn covers the period in which commencements declined, and finishes when they had returned to historical levels (that is, September quarter 2008 through to December quarter 2009). Our comparison is the period immediately before the downturn. Once again, to preserve seasonality the comparison period is September quarter 2007 through to June quarter 2008, with the first two quarters counted twice to preserve balance. (Seasonally adjusted data are not available at the occupational level.) For trade occupations, we use the percentage change in employment between February 2010 (approximately 12 months after the middle of the downturn in commencements) and November 2008, 12 months after the middle of the comparison period.

Figure 8 plots the percentage change in apprenticeship commencements against the change in trades employment between the respective periods. For the trades, there is a small, positive correlation (0.29) between the percentage change in employment and the percentage change in apprenticeship commencements. Most of the trade occupational categories occupy the lower left quadrant. That is, a decline in apprenticeships accompanied a decline in employment. Included in this group are the largest trade occupations in terms of apprentice numbers: automotive and engineering and construction, which together account for approximately half of all apprenticeship commencements. The other occupations in this quadrant are hairdressing, wood trades workers and textile, clothing and footwear trades workers. Employment in the food trades recorded a decrease in commencements between the comparison period and the downturn period and a very small decline in employment. In three occupations, increases in apprentice commencements during the downturn were followed by increases in employment. These were skilled animal and horticultural workers, printing trades workers and engineering, ICT and science technicians. Of these two occupations, skilled animal and horticultural workers and engineering, ICT and science technicians have quite different characteristics from the traditional trade occupations, and printing has been in long-term decline. The other outliers in the lower right quadrant are electrotechnology and telecommunications trades, which experienced declines in the number of apprenticeship commencements between the comparison period and the downturn period but which showed increases in employment between November 2008 and February 2010.

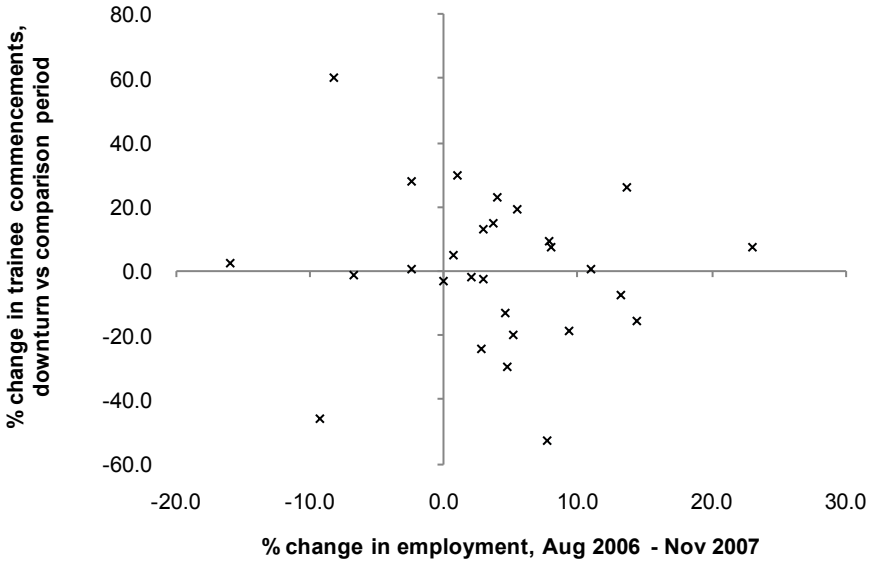
Figure 8 Change in apprenticeship commencements by change in employment, trade occupations



Sources: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

Turning now to the non-trade occupations, we plot the percentage change in traineeship commencements between the downturn period and the reference period against the percentage change in employment in non-trade occupations between November 2007, five quarters before the middle of the downturn, and August 2006, five quarters before the middle of the corresponding growth period. This is following on from the regression results, which indicated that traineeship commencements were associated with employment in non-trade occupations in the following quarter. Figure 9 shows there was no overall pattern for the non-trade occupations. Results for the non-trade occupations are distributed in all four quadrants, without any apparent grouping of occupations at the one-digit level. The correlation between the percentage change in non-trade employment and the percentage change in trainee commencements was less than half that for the trades occupations, and negative (-0.10). This reflects the different labour market dynamics for traineeships compared with those for apprenticeships (see Cully 2009). Demand for traineeships is not as strongly linked to demand for employment in non-trade occupations as it is for trade apprenticeships and is confounded by other factors. While there may be some sort of relationship between commencement numbers and employment numbers at the aggregate level, this apparent relationship does not hold for the non-trade occupations when we examine data at the two-digit ANZSCO level.

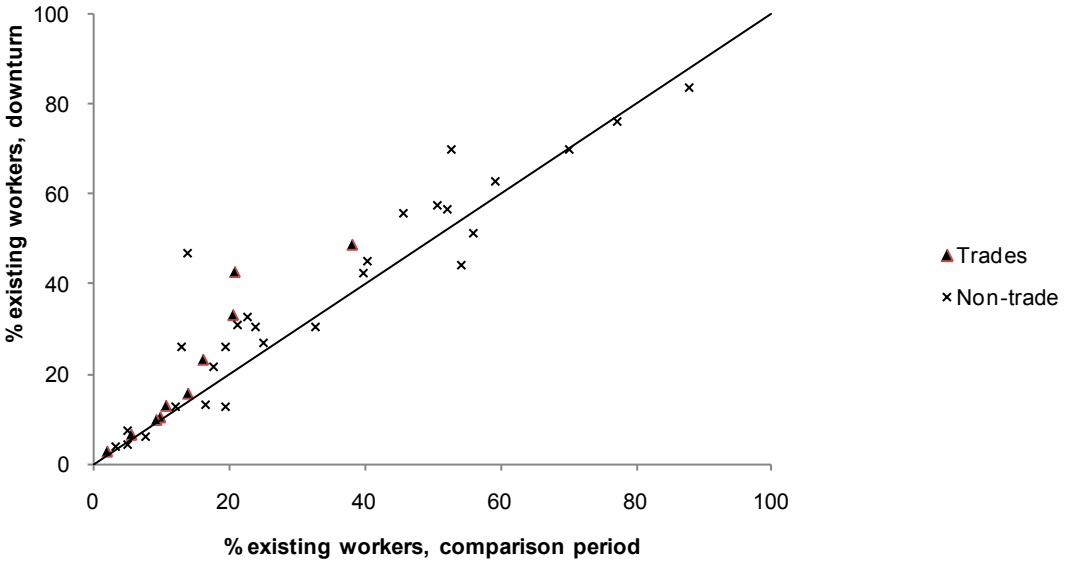
Figure 9 Change in traineeship commencements by change in employment, non-trade occupations



Sources: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

In the relationship between commencements and employment, we have observed considerable variation by occupation, especially in the non-trades. To explore this further, we consider whether the change in commencements is influenced by the proportion of existing workers taking up traineeships and, to a lesser extent, apprenticeships. During the downturn, it was suggested that the subsidies available in the apprenticeship system were used by employers to maintain workers already in employment. We also find support for this conclusion in the 2010 Apprentice and Trainee Destination Survey. Among those commencing training in a non-trade occupation, the main reason for their undertaking the training was that it was recommended by the company (not mandatory), at 31.9% for completers and 32.1% for non-completers, up from 13.7% and 14.3% respectively for 2008 (NCVER 2010, p.9). If this were the case, we would expect to see increases in the proportion of apprentice and trainee commencements who are existing workers. In figure 10 we see that there has been an increase in the proportion of existing workers, but those occupations with already high proportions of existing workers experienced smaller increases. Perhaps this is because of a boundary effect. For example, if 80% of trainees are existing workers, there is less scope to increase relative to an occupation in which, say, 40% of trainees are existing workers.

Figure 10 Percentage of commencements who are existing workers, downturn vs comparison period



Sources: NCVER Apprentice and Trainee Collection, June 2010.

To tease out whether the characteristics of the occupation can assist our analysis further, we ran a simple regression. Looking at the two-digit occupational level, we attempted to see whether the percentage change in commencements between the comparison period in 2007 and the 2008—09 downturn could be explained by the percentage change in employment as well as the characteristics of apprentices and trainees in the different occupations, including the proportion of existing workers, the proportion of full-time apprentices, the proportion of female apprentices, the age distribution and the distribution of the contract duration. However, the results, shown in appendix B, made little sense, producing a number of curious and unlikely outcomes. Employers' decisions not to take on new apprentice and trainee commencements were not consistent with their reactions to changes in previous downturns, nor is there convincing evidence that the downturn prompted employers of apprentices and trainees to act in a particular way, such as by prioritising subsidies for existing workers or favouring occupations with short contract durations.

Instead of examining the number of apprenticeship commencements, Karmel and Mlotkowski (2008) modelled the impact of labour market conditions on the number of trade apprentices in training, using annual data from 1967 to 2006. We can use their findings to generate expected values for the number of trade apprentices and trainees in training, given the changed labour market situations, and compare them with the actual numbers.

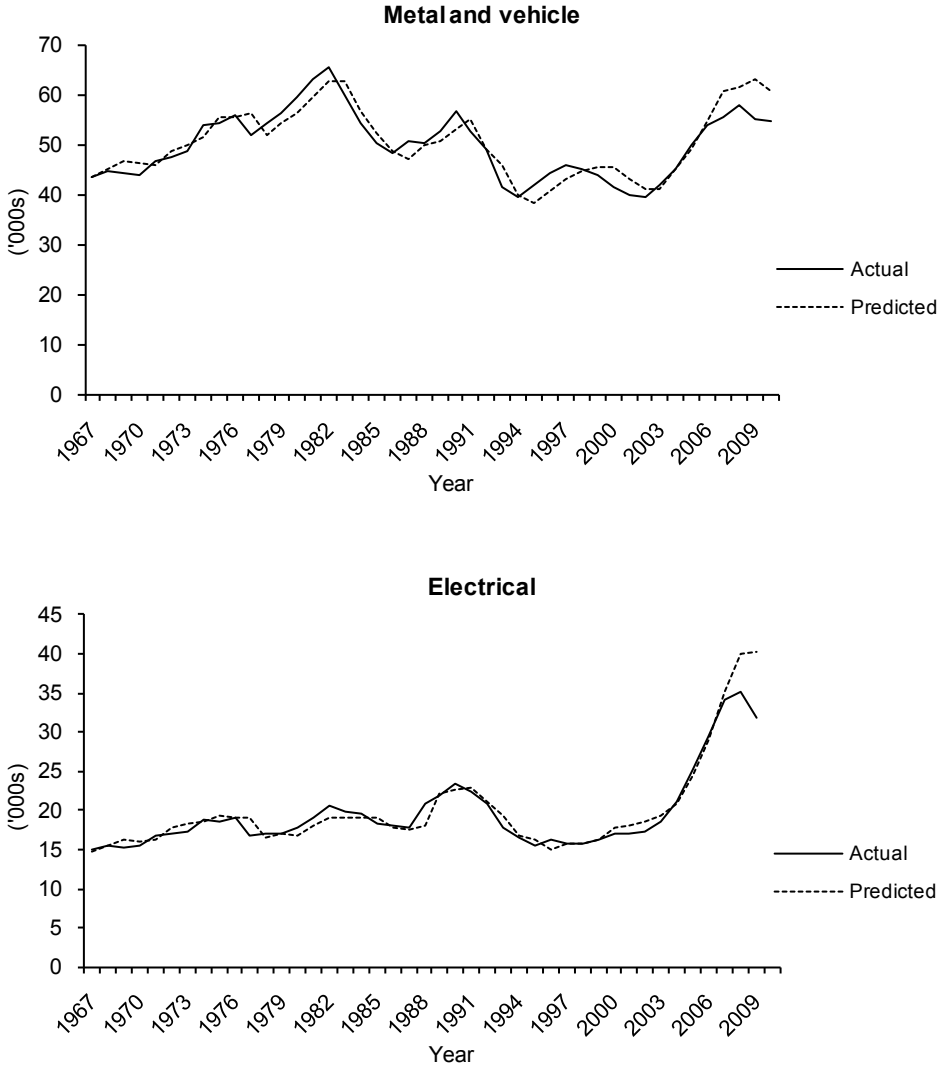
What we can see from the graphs in figure 11 and the summary results in table 8 is that the models generally over-predicted the number of apprentices and trainees in-training. The only trade which the model under-predicted was the anomalous printing trade. Its long-term decline means that it is negatively correlated with total employment. The gap between the actual and predicted numbers is particularly large for the electrical trades (-20.7%) and the metal and vehicle trades (-13.0%). These results provide additional evidence that the strong decline in commencements that occurred in 2008—09 was consistent with employers anticipating a decline in employment far worse than this in reality.

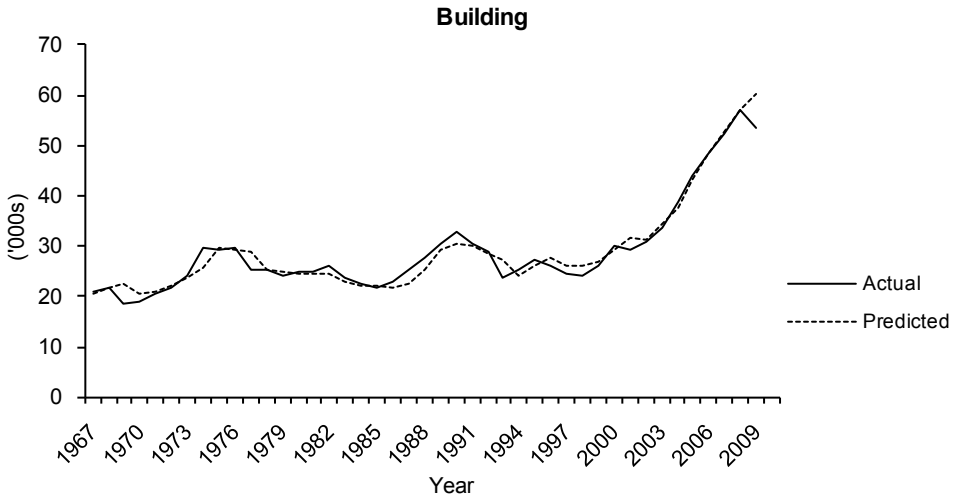
Table 8 Expected and actual numbers of apprentices in training for selected trade occupations, 2009

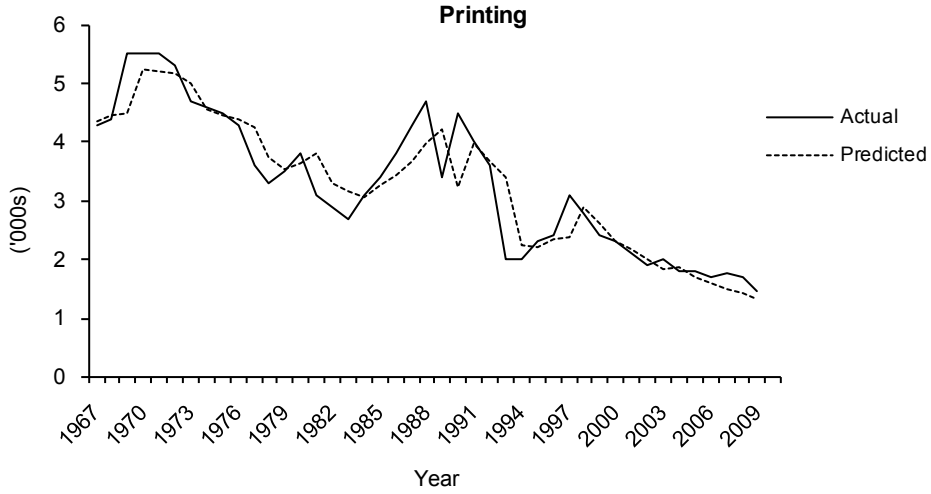
	Expected ('000s)	Actual ('000s)	Difference (%)
Metal & Vehicle	63.3	55.0	-13.0
Electrical	40.3	31.9	-20.7
Building	60.1	53.7	-10.8
Printing	1.3	1.5	12.1
Food	24.4	22.6	-7.5

Notes: Occupations are grouped using ASCO (Australian Standard Classification of Occupations) major headings, for consistency with Karmel and Mlotkowski (2008).
Actual values are taken from NCVER Apprentice and Trainee Collection, June 2010, unpublished data.
Expected values are calculated using equations presented in Karmel and Mlotkowski (2008), using data from NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

Figure 11 Actual and predicted apprentices in training by trade occupation, 1967—2009







Sources: NCVER Apprentice and Trainee Collection, June 2010; ABS (2003, 2010b).

Impact on completion

Completions during the downturn will depend on the flow of apprentices and trainees in the system, which will largely be determined by intakes in the preceding years and completion rates. The major impact on completions will be in the future, when the diminished cohort who began their training during the downturn completes their training.

Thus, completion numbers during 2008—09 are mostly a reflection of the economic conditions in the preceding years, which came at the end of a period of historic growth in the apprentice and trainee system. For this reason, what we observe is generally an increase in the number of apprentices and trainees completing their training. Once again comparing the six-quarter downturn period with the comparison growth period, the number of completions increased by 7.6% for all apprentices and trainees, with a 12.3% increase for trade occupations and a 5.8% increase for non-trade occupations. As table 9 shows, the increase was consistent across occupational categories, with the only exceptions being blue-collar traineeships for machinery operators and drivers and labourers.

Table 9 Number of apprentice and trainee completions

Occupation (ANZSCO — NTIS) group	Total completions		% change in completions, downturn to growth periods
	Downturn	Comparison period	
1 Managers	3 891	2 483	56.7
2 Professionals	5 135	2 891	77.6
3 Technicians and trades workers	67 380	59 997	12.3
31 Engineering, ICT and science technicians	2 982	2 345	27.2
32 Automotive and engineering trades workers	18 517	17 016	8.8
33 Construction trades workers	16 842	15 848	6.3
34 Electrotechnology and telecommunications trades workers	10 518	8 122	29.5
35 Food trades workers	5 978	5 522	8.2
36 Skilled animal and horticultural workers	3 033	2 641	14.9
39 Other technicians and trades workers	9 511	8 503	11.9
4 Community and personal service workers	37 820	37 089	2.0
5 Clerical and administrative workers	46 392	42 557	9.0
6 Sales workers	33 616	29 368	14.5
7 Machinery operators and drivers	24 364	27 054	-9.9
8 Labourers	20 760	21 080	-1.5
Non-trades	171 979	162 522	5.8
Total	**239 359**	**222 519**	**7.6**

Source: NCVER Apprentice and Trainee Collection, June 2010.

Where we might expect a more immediate effect of the downturn is on completion rates. The completion rate reflects the proportion of a cohort who commences an apprenticeship or traineeship in a given period and who goes on to complete their training at some point in the future. Here we have conflicting forces, with an increase in apprentices and trainees losing their jobs through redundancy offset by a reduction in apprentice and trainees leaving their jobs voluntarily as other employment opportunities dry up. Whether completion rates go up or down is an empirical question, although Karmel and Misko (2009) argued that they would be more likely to increase, on the basis that the proportion of apprentices and trainees losing their jobs is relatively small.

One problem with calculating completion rates is that we need to follow a cohort for a considerable period of time. In addition, the downturn will impact on a number of cohorts — some at the beginning of their training, some well into their training and some at the end. We overcome this by estimating completion rates by applying a life-table approach to cross-sectional data (see Karmel & Mlotkowski 2010). The estimates assume that, as a commencing cohort progresses, the patterns of completions and cancellations or withdrawals will be the same as those observed in the quarter the cohort commenced.

As the downturn quarter, we select the first quarter of 2009. This quarter represents the trough for apprentice and trainee commencements on a seasonally adjusted basis. We compare it with the first quarter (to maintain seasonality) from 2007. The results are shown in table 10. Apprentices and trainees commencing in the March 2007 quarter, before the onset of the downturn, had a 47.6% likelihood of completing their training within 19 quarters. Those commencing 24 months later, in the March 2009 quarter when the effects of the downturn had begun to be felt, had a 50.9% likelihood of completing. The percentage-point change in completion rates was higher for the non-trade occupations (from 50.8% to 52.7%) than for the trade occupations (43.8 % to 45.3%).

Table 10 Cross-sectional completion rates for apprentices and trainees, cohorts commencing quarter 1, 2007 and quarter 1, 2009

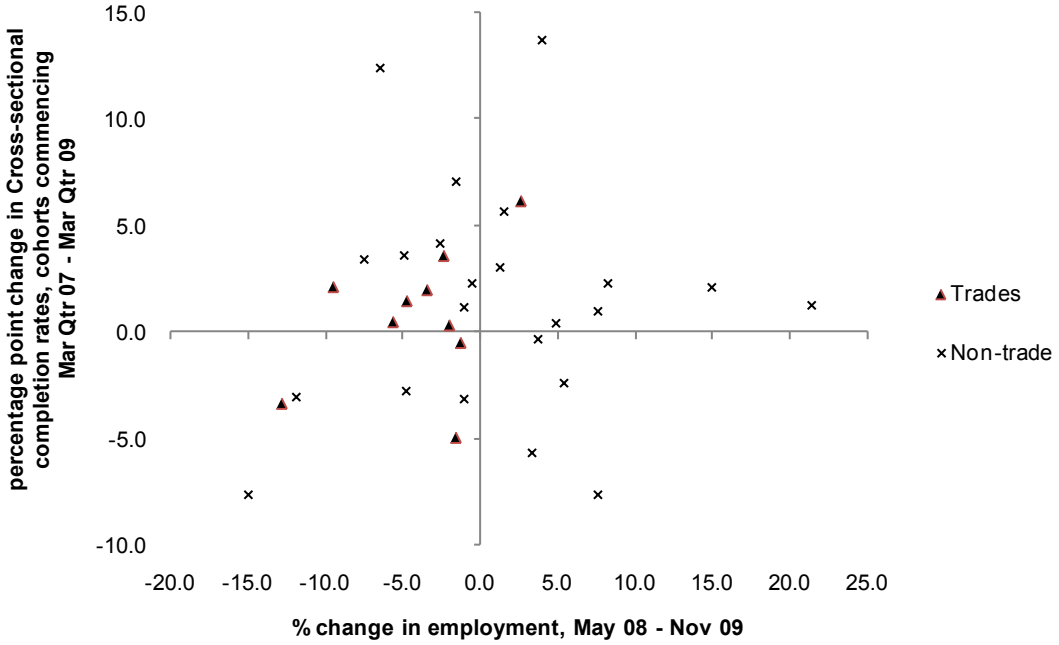
Occupation (ANZSCO – NTIS) group	Proportion completing within 19 quarters. Commencing cohort (%)	
	Q1 2007	Q1 2009
Technicians and trades workers	43.8	45.1
All other occupations	50.8	52.7
Total apprentices and trainees	**47.6**	**50.9**

Source: NCVER Apprentice and Trainee Collection 63.

Once again, we examine whether this is related to changes in total employment at the occupational level. For our employment data, we select for the downturn period the November 2009 quarterly data. This corresponds to the end of the downturn. For the comparison period, we use May 2008, which is the last quarter before the downturn in apprenticeships and traineeships began. The results are shown in figure 12. In the trade occupations, most observations are in the upper left quadrant, reflecting a decrease in the employment and an increase in completion rates. However, there is, as expected, a positive correlation (0.41) between percentage changes in employment and change in completion rates. It could be that in the trade occupations which experienced a particularly sharp decrease in employment, an increase in the number of apprentices being made redundant impacted adversely on the completion rate. Equally, apprentices in declining trade occupations could have made a decision not to continue their training in light of poor employment prospects on completion.

For the non-trade occupations, no such relationship is evident. We speculate that the increase in completions rates has more to do with overall employment conditions, since this has a greater influence on the likelihood of finding alternative employment before completing training. Occupational employment rates may be irrelevant, since not completing training may be a signal that the apprentice or trainee does not wish to continue working in that occupation. As we will see in a later section, even during the downturn the number of trainees choosing not to complete their training far eclipsed those whose training contract was cancelled because they were made redundant.

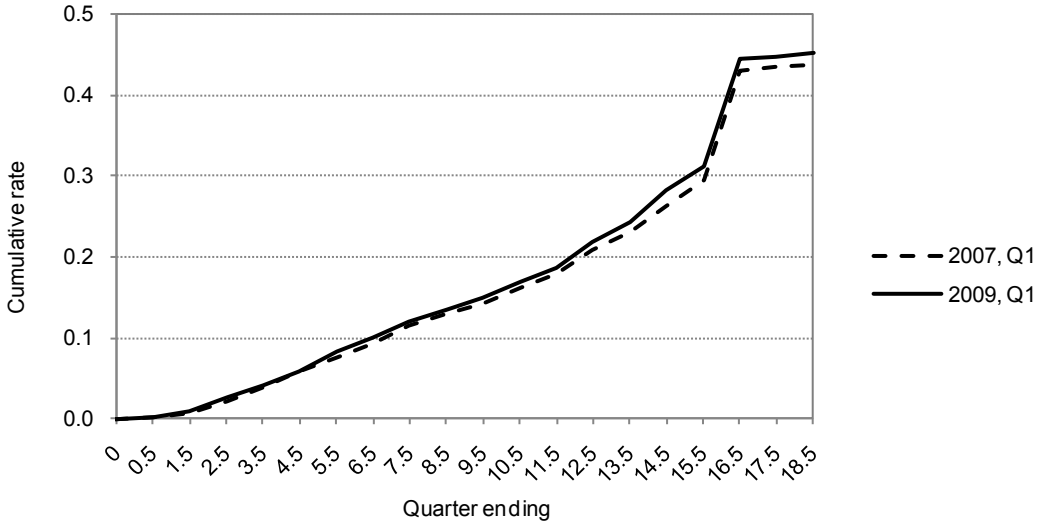
Figure 12 Change in cross-sectional completion rates (March quarter 2007—09) by change in employment (March 2008 – November 2009)



Sources: NCVER Apprentice and Trainee Collection 63; ABS (2003, 2010b).

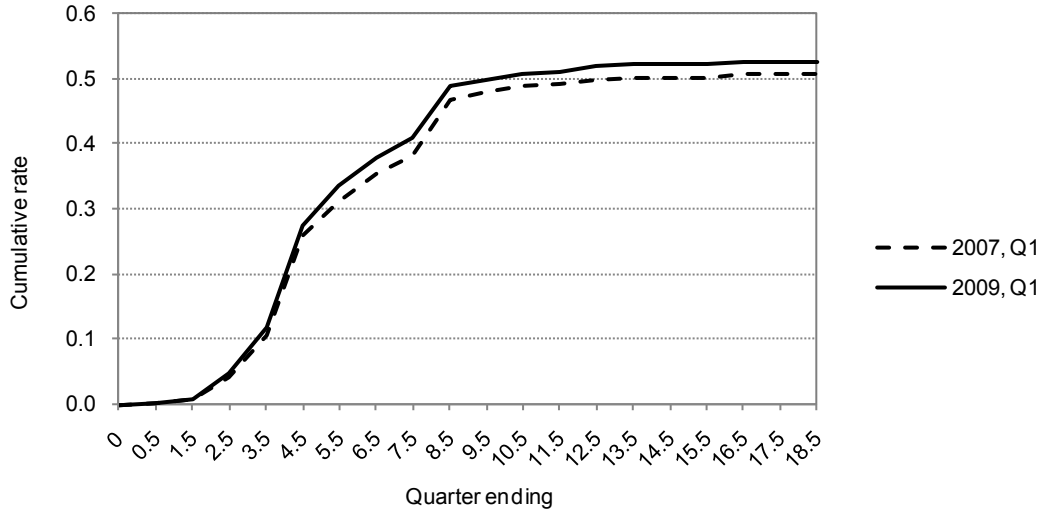
Anecdotal evidence suggested that in response to the economic downturn employers were making a conscious effort to sign off trade apprentices and trainees earlier than anticipated rather than having to terminate their contracts prior to completion. We can use the same completions data to examine the cumulative completion rate. Looking first of all at the cumulative completion rates for trade occupations (figure 13), we see a very slight increase of around 1.5 percentage points in the overall completion rate between 2007 and 2009. We also see a slight increase in the rate of completion, particularly around 14 quarters (or three-and-a-half years) after commencement. There is a similar pattern when looking at the cumulative completion rates for non-trade occupations (figure 14). Here, completion rates for the 2009 downturn cohort have increased by around two percentage points compared with the cohorts who commenced in the first quarter of 2007.

Figure 13 Cumulative completion rates for apprentices and trainees in trade occupations commencing March Quarter 2007 and March quarter 2009



Source: NCVER Apprentice and Trainee Collection 63.

Figure 14 Cumulative completion rates for apprentices and trainees in non-trade occupations commencing March Quarter 2007 and March quarter 2009



Source: NCVER Apprentice and Trainee Collection 63.

Impact on cancellations and withdrawals

It follows that, if we expect more apprentices and trainees to go on to complete their training, there will be fewer apprentices and trainees who choose not to complete. The lack of alternative employment opportunities provides a strong incentive to remain in training. However, in a downturn, this will be offset to an extent by apprentices and trainees who have been made redundant. In the National Centre for Vocational Education Research (NCVER) administrative collection, anyone who does not complete their training is recorded as a 'cancellation' or in some circumstances (depending on the state and the time elapsed since commencing the training contract) a 'withdrawal'. The reason why the apprentice or trainee did not complete is not recorded. The reasons for non-completion are collected in the NCVER Apprentice and Trainee Destination Survey, conducted in 2008 and again in 2010. We would therefore expect that the attrition rate would decrease during a downturn, with redundancies making up a much greater proportion of those remaining cancellations and withdrawals.

As we observed in the introduction, seasonally adjusted cancellations and withdrawals have been on the decrease since the economic downturn. Cancellations and withdrawals during the downturn period were 4.1% lower than during the comparison period. Table 11 shows that among non-trade occupations the decline was 7.3%, while the number of cancellations and withdrawals among trade occupations actually increased slightly (0.7%), most likely reflecting the growth in trade apprentices being made redundant.

Table 11 Change in apprentice cancellations and withdrawals by occupation

Occupation (ANZSCO — NTIS) group	Total cancellations & withdrawals		% change in cancellations & withdrawals, downturn to growth periods
	Downturn period	Comparison period	
1 Managers	3 075	2 303	33.5
2 Professionals	2 084	2 321	-10.2
3 Technicians and trades workers	77 538	76 972	0.7
31 Engineering, ICT and science technicians	1 782	1 529	16.5
32 Automotive and engineering trades workers	17 389	18 236	-4.6
33 Construction trades workers	21 372	20 543	4.0
34 Electrotechnology and telecommunications trades workers	8 063	7 874	2.4
35 Food trades workers	13 642	14 480	-5.8
36 Skilled animal and horticultural workers	3 118	2 888	8.0
39 Other technicians and trades workers	12 171	11 422	6.6
4 Community and personal service workers	24 917	24 971	-0.2
5 Clerical and administrative workers	26 620	28 514	-6.6
6 Sales workers	26 901	29 326	-8.3
7 Machinery operators and drivers	12 571	15 663	-19.7
8 Labourers	16 144	17 993	-10.3
Non-trades	112 311	121 091	-7.3
Total	**189 849**	**198 063**	**-4.1**

Source: NCVER Apprentice and Trainee Collection 63.

More meaningful is the decrease in the attrition rate since the downturn began. The cross-sectional attrition rate is calculated using the same approach as the cross-sectional completion rates. It represents the proportion of a cohort who commenced an apprenticeship or traineeship in a given period, who do not complete their training and whose contract is cancelled or withdrawn. The relevant figures are shown in table 12. The estimated attrition rate for apprentices and trainees commencing in the March quarter 2007 is 46.3%. For apprentices and trainees who commenced in the March quarter 2009, it is 43.5%. For the non-trades, the attrition rate declined from 43.3% to 38.6%. For the trades, there was much less movement, declining from 51.8% to 51.1%.

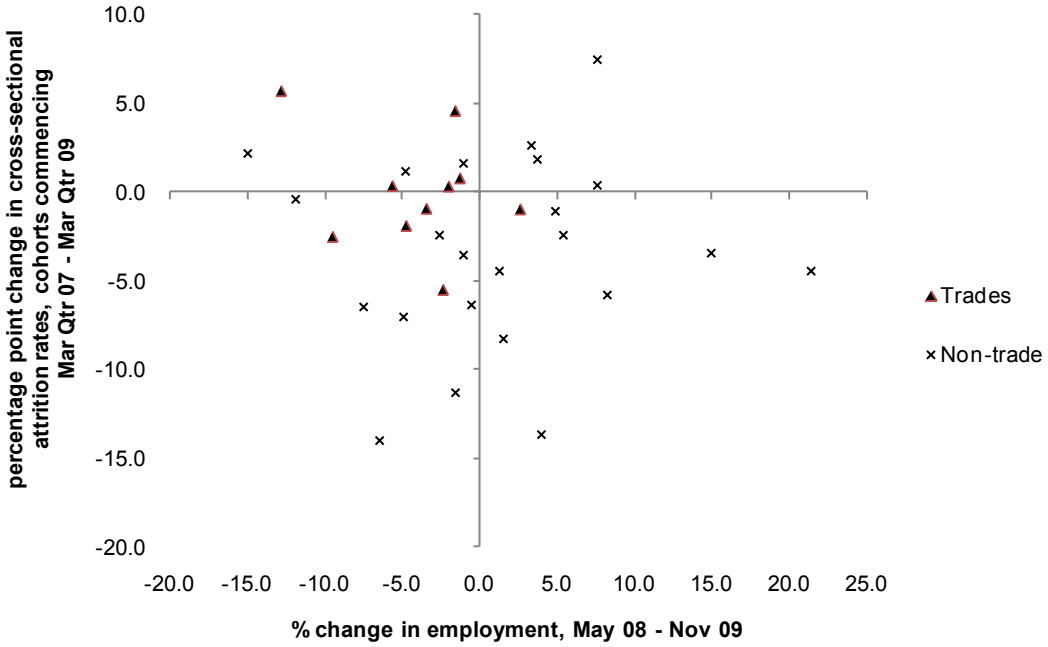
Table 12 Cross-sectional attrition rates for apprentices and trainees, cohorts commencing quarter 1, 2007 and quarter 1, 2009

Occupation (ANZSCO – NTIS) group	Proportion cancelling or withdrawing within 19 quarters Commencing cohort (%)	
	Q1 2007	Q1 2009
Technicians and trades workers	51.8	51.0
All other occupations	43.3	38.6
Total apprentices and trainees	**46.3**	**43.5**

Source: NCVER Apprentice and Trainee Collection 63.

We would expect any relationship between the change in total employment and the change in the attrition rate to be the same as for the completion rate, except reversed. Figure 15 shows this to be the case. For the trade occupations, the percentage change in employment is negatively related to the change in the attrition rate. It is logical for an increase in out-of-trade apprentices to be accompanied by redundancies among qualified trades workers. For the non-trade occupations, there is no evident relationship between employment and the attrition rate. However, there is little doubt that attrition decreased in the majority of cases. It is overall economic conditions that seem to exert quite a substantial impact on cancellations and withdrawals rather than industry- or occupation-specific factors. This is consistent with the idea that cancellations and withdrawals, especially in the non-trades, are driven primarily by the extent of opportunities elsewhere.

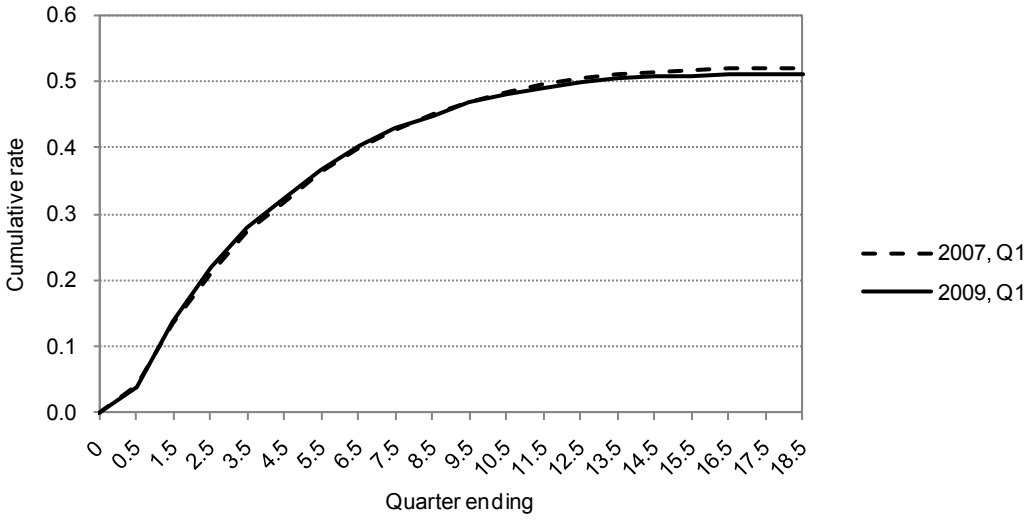
Figure 15 Change in cancellations and withdrawals by change in employment, 2008—09



Sources: NCVER Apprentice and Trainee Collection 63; ABS (2003, 2010b).

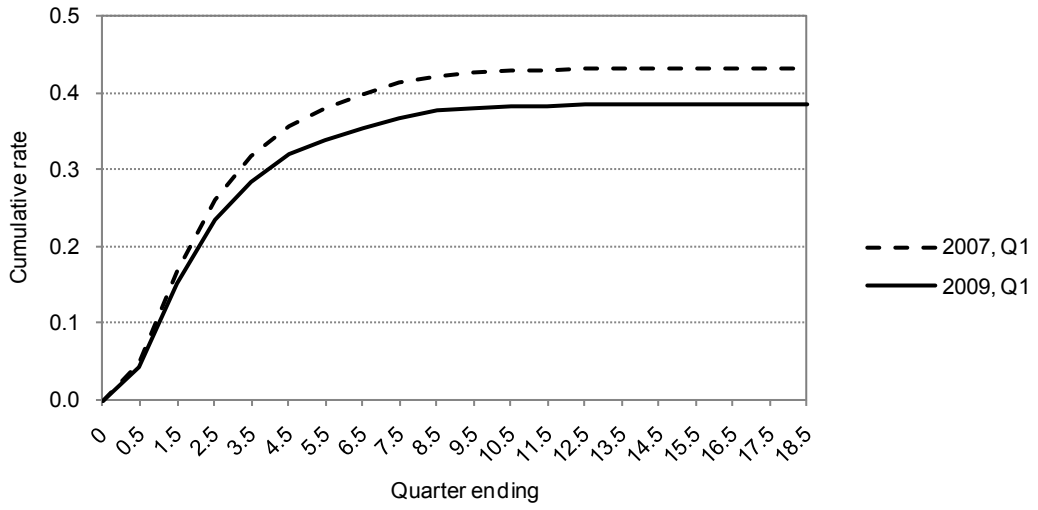
Once again, we can use the same data to plot the cumulative attrition rates, for the three cohorts commencing in the March quarter in 2007, 2008 and 2009. These are shown in figures 16 and 17 for the trades and non-trades respectively. In the trades, we see that there has been no noticeable change in the cumulative attrition rate. In the non-trades the decrease in attrition rates between 2007 and 2009 is greater than in the trades, with the shift apparent from the fourth quarter.

Figure 16 Cumulative attrition rates for apprentices and trainees in trade occupations commencing March quarter 2007 and March quarter 2009



Source: NCVER Apprentice and Trainee Collection 63.

Figure 17 Cumulative attrition rates for apprentices and trainees in non-trade occupations commencing March Quarter 2007 and March quarter 2009



Source: NCVER Apprentice and Trainee Collection 63.

Between 2008 and 2010, there was a clear change in the reasons for contract cancellations and withdrawals. Table 13 presents the Apprentice and Trainee Destination Survey results from both years and shows the main reason for non-completion of an apprenticeship or traineeship. As expected, as opportunities in the labour market became more restricted, apprentices and trainees stayed with their contracts of training. In the 2010 survey, fewer were citing reasons such as low pay, poor work conditions/did not like boss or were unhappy with their training as their reason for leaving.

However, while fewer apprentices and trainees were choosing to leave their training, there was a rise in the number of cancellations forced upon apprentices and trainees due to the economic downturn, through redundancy or job loss. Data from the 2010 Apprentice and Trainee Destination Survey, shown in table 13, shows that 26.8% of non-completers in a trade occupation cited their main reason for non-completion as job loss or redundancy, up significantly from 9.5% in the 2008 survey. In the electrotechnology and telecommunication, construction and automotive/engineering trade occupations, these figures were again higher at 35.5%, 29.1% and 30.2%, respectively. Apprentices and trainees in non-trade occupations were also affected by job loss and redundancy; cited at 15.2% in the 2010 survey, up from 7.5% in the 2008 survey.

Table 13 Main reason for not completing an apprenticeship or traineeship by occupation, 2008 and 2010 (%)

ANZSCO	2008		2010	
	Job loss or redundancy	Any other reason	Job loss or redundancy	Any other reason
3 Trades and technical workers	9.5	90.5	26.8	73.2
32 Automotive and engineering trades workers	11.3	88.7	30.2	69.8
33 Construction trades workers	6.1	93.9	29.1	70.9
34 Electrotechnology and telecommunications trades workers	15.1	84.9	35.5	64.5
35 Food trades workers	11.5	88.5	12.2	87.8
391 Hairdressers	7.5	92.5	16.1	83.9
Other trades and tech	8.9	91.1	30.4	69.6
Non-trades	7.5	92.5	15.2	84.8
Total apprentices and trainees	**8.2**	**91.8**	**18.8**	**81.2**

Source: NCVER Apprentice and Trainee Destination Survey, 2008 and 2010.

On the basis of the survey results, we estimate the number of out-of-trade apprentices, using data from the apprentice and trainee collection (see table 14). Approximately 3366 apprentices and trainees in trade occupations and 2625 apprentices and trainees in non-trade occupations discontinued their training because they lost their job or were made redundant between April and June 2009. To compare, there were 3727 fewer commencements in trade occupations in that quarter when compared with the June Quarter in 2008 and 7089 fewer commencements in non-trade occupations. When viewed in isolation, a doubling of the number of out-of-trade apprentices looks dramatic; however, in context it can be seen as less significant to long-term supply than the decrease in commencements. What is also clear is that even in the downturn, apprentices and trainees in trade occupations who decided to leave their training continued to outnumber those who were made redundant by nearly three to one and the increase in out-of-trade apprentices was more than offset by the reduction in voluntary cancellations.

Table 14 Number of apprentice and trainee cancellations because of redundancy and other reasons, 2007 and 2009

Reporting period	Oct. – Dec. 2007			Apr. – Jun. 2009		
Occupation (ANZSCO — NTIS) group	Redundant	Other reasons	Total	Redundant	Other reasons	Total
3 Trades and technical workers	1 230	11 748	12 978	3 366	9 190	12 556
32 Automotive and engineering trades workers	349	2 729	3 078	852	1 966	2 818
33 Construction trades workers	210	3 218	3 428	1 001	2 442	3 442
34 Electrotechnology and telecommunications trades workers	196	1 099	1 295	481	876	1 357
35 Food trades workers	294	2 265	2 559	259	1 858	2 117
391 Hairdressers	95	1 169	1 264	179	933	1 112
Other trades and tech	120	1 234	1 354	521	1 190	1 711
Non-trades	1 541	19 058	**20 599**	2 625	14 677	17 301
Total	**2 771**	**30 806**	**33 577**	**5 991**	**23 867**	**29 857**

Source: NCVER Apprentice and Trainee Destination Survey, 2008, 2010; NCVER Apprentice and Trainee Collection, June 2010.

Out-of-trade apprentices

Out-of-trade apprentices, those who did not complete their training because of redundancy or job loss, clearly comprise a more significant group during an economic downturn. The outcomes for trade apprentices and trainees who did not complete due to job loss or redundancy are shown in table 15. Compared with trades apprentices who did not complete for other reasons, trade apprentices and trainees who lost their job or who were made redundant were, approximately nine months after leaving their training, less likely to be employed, more likely to be unemployed and less likely to be enrolled in further study (including another apprenticeship or traineeship). However, none of these differences is statistically significant.

Table 15 Employment and further study outcomes for out of trade apprentices and trainees in trade occupations, (%)

Approximately 9 months after apprenticeship/traineeship	Main reason was job loss or redundancy					All other reasons
	32 Automotive & engineering trades	33 Construction trades	34 Electro-technology trades	All other trades workers	3 All trade workers	All trade workers
Employed	68.2	68.7	82.8	64.4	69.6	73.7
Full-time	55.8	57.1	69.1	36.6	52.4	54.4
Part-time	12.4	11.6	13.7	27.8	17.2	19.4
Not employed	31.8	31.3	17.2	35.6	30.4	26.3
Unemployed	24.8	24.8	**	25.4	23.4	18.8
Not in labour force	7.0	6.5	**	10.3	7.0	7.5
Employed in same occupation as apprenticeship/traineeship	19.7	20.6	24.4	20.7	21.0	20.3
Enrolled in further study or training	30.1	31.6	46.8	28.6	32.8	36.6
Commenced another apprenticeship or traineeship	16.6	21.0	36.8	14.7	20.4	20.9

Note: **cannot be shown because of insufficient numbers.
Source: Apprentice and Trainee Destination Survey 2010.

It would be expected that if training authorities concentrated their efforts on finding new placements for out-of-trade apprentices, then out-of-trade apprentices would be more likely than other non-completers in trade occupations to have commenced another apprenticeship. In fact, what we find in table 16 is considerable wastage. Only one in five apprentices in trade occupations who lost their jobs or who were made redundant had started another apprenticeship or traineeship. This proportion is lower than in 2008, but of course, as table 17 demonstrates, the numbers involved are much greater.

The true proportion of out-of-trade apprentices who take up another apprenticeship is somewhat higher. The sample scope for the Apprentice and Trainee Destination Survey excludes individuals who stopped their training in the relevant quarter but who commenced another apprenticeship in the same occupation before the sample was drawn. In the case of the 2010 sample, 4949 clients were excluded from the pool of 60 973 on this basis. However, these numbers include all apprentices and trainees who stopped their training, not just those who were made redundant.

As we have seen, the decline in apprentice commencements represents a greater loss to the training system than the increase in out-of-trade apprentices. Particularly when the number of apprentice commencements also declines sharply, finding new training places for out-of-trade apprentices is destined to be a challenge. It may be that allowing out-of-trade apprentices to continue their training in an institutional setting is the only way to substantially reduce the wastage.

Table 16 Proportion of non-completing apprentices who commence another apprenticeship or traineeship, by reason for non-completion, 2008 and 2010 (%)

	2008		2010	
	Job loss or redundancy	Any other reason	Job loss or redundancy	Any other reason
Undertaking another apprenticeship or traineeship	24.4	19.9	20.4	20.9
Related to the type of training in the initial apprenticeship of traineeship	13.7	9.6	12.0	7.9
Not related to the type of training in the initial apprenticeship of traineeship	10.7	10.3	8.4	13.0
Not undertaking another apprenticeship or traineeship	75.6	80.1	79.6	79.1

Source: NCVER Apprentice and Trainee Destination Survey, 2008, 2010; NCVER Apprentice and Trainee Collection, June 2010.

Table 17 Number of out-of-trade apprentices who return to training, 2008 and 2010

Occupation (ANZSCO — NTIS) group	2008		2010	
	Number made redundant	Number who return	Number made redundant	Number who return
3 Trades and technical workers	1230	301	3366	688
32 Automotive and engineering trades workers	349	**	852	142
33 Construction trades workers	210	**	1001	210
34 Electrotechnology and telecommunications trades workers	196	**	481	177
All other trades and technical workers	475	**	1032	151

Note: ** There are too few responses to report detail at the two-digit occupational level in 2008.

Source: NCVER Apprentice and Trainee Destination Survey, 2008, 2010; NCVER Apprentice and Trainee Collection, June 2010.

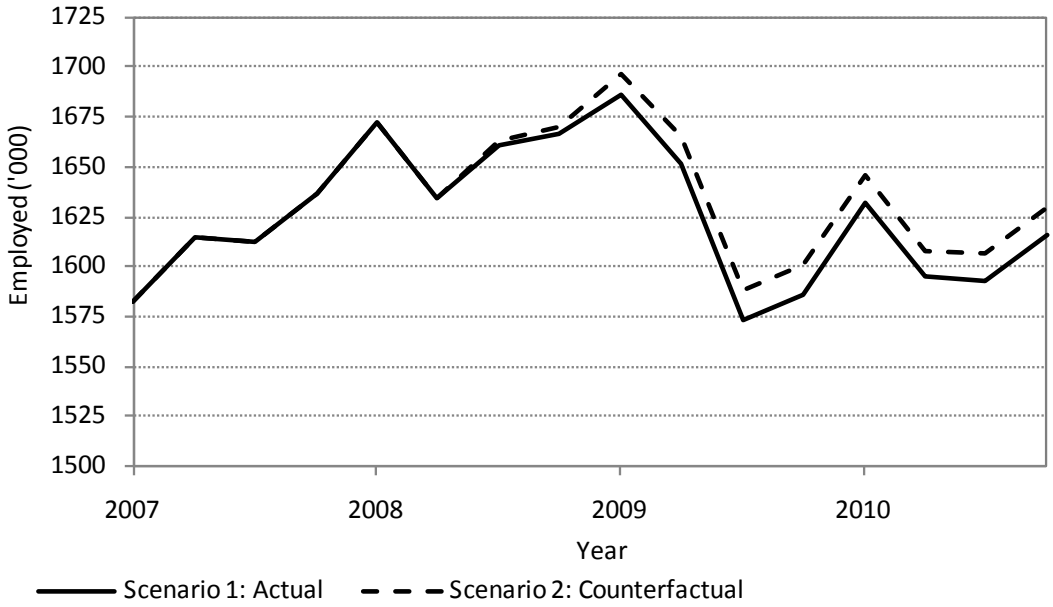
Final comments

The apprenticeship and traineeship system experienced a considerable shock as a result of the recent economic downturn, with a sharp decline in commencements during the second half of 2008 and the first half of 2009. By comparison, the effect of the downturn on employment was not as severe.

Ultimately, the downturn was short-lived and, given how quickly commencements returned to their pre-downturn level, completions should also exceed pre-downturn levels once most of the cohort who commenced in 2008—09 completes its training in 2012—13.

Because of the rapid rebound in apprenticeship commencements, the impact of the downturn on the skilled labour force will be minimal. Karmel and Rice (2010) forecast employment numbers in the trade occupations, taking into account the change in apprenticeship commencement numbers but assuming that occupational and apprentice attrition rates remain the same. On that basis, they conclude that the shock in commencements will reduce the supply of tradespeople by less than 1% compared with the counterfactual situation of no decline in commencements. As figure 18 shows, this represents a 'once and for all' change in the supply of tradespeople.

Figure 18 Long-term impact of the decline in commencements, all trades



Source: Karmel and Rice (2010, p.43).

Even at the more detailed occupational level, the interruption to supply is relatively minor. In the larger trades — automotive and engineering, construction, and electrotechnology and telecommunications trades workers — the impact ranges between 1.5% and 2.2 % (Karmel & Rice 2010, p.44).

On balance, we are left with the observation that employers initially anticipated a more severe downturn than actually occurred but the apprentice and trainee system recovered quickly, without incurring a significant loss of capacity. Ultimately, it is the economy's quick return to growth that will impose greater demands on the apprentice and trainee system.

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Appendix A

Table A1 Comparison of regression models testing apprentice commencements against lagged commencements, trade employment and change in trade employment

Definition of change in employment terms	Residual sum of squares	
	Model without quadratic terms	Model with quadratic terms
$E_t\ E_{t-8}$	6 146 922	6 121 702
$E_t\ E_{t-7}$	6 178 689	6 123 090
$E_t\ E_{t-6}$	6 171 805	6 156 509
$E_t\ E_{t-5}$	6 124 871	6 115 679
$E_t\ E_{t-4}$	6 155 653	6 132 822
$E_t\ E_{t-3}$	6 128 725	6 100 147
$E_t\ E_{t-2}$	6 107 650	6 015 986
$E_t\ E_{t-1}$	6 112 656	6 074 278
$E_{t+1}\ E_t$	6 185 274	6 150 138
$E_{t+2}\ E_t$	6 058 902	5 965 034
$E_{t+3}\ E_t$	5 578 347	5 558 285
$E_{t+4}\ E_t$	5 226 694	5 155 136
$E_{t+5}\ E_t$	5 290 865	5 282 900
$E_{t+6}\ E_t$	5 580 767	5 511 960
$E_{t+7}\ E_t$	5 805 040	5 673 293
$E_{t+8}\ E_t$	5 942 232	5 837 915

F-test on models, $E_{t+4}\ E_t$, apprentice commencements

Model	N	No. of par	Residual sum squares	F score	sig
Full model with all difference and sq difference terms	440	6	5 155 136		
Without square terms	440	4	5 226 694	3.012	0.050
Full model with all difference and sq difference terms	440	6	5 155 136		
Restricted model with only employment at t	440	2	6 194 335	21.872	0.000

Table A2 Comparison of regression models testing trainee commencements against lagged commencements, trade employment and change in non-trade employment

Definition of change in employment terms	Residual sum of squares	
	Model without quadratic terms	Model with quadratic terms
$E_t E_{t-8}$	13 826 018	13 811 237
$E_t E_{t-7}$	13 665 807	13 342 422
$E_t E_{t-6}$	13 867 977	13 760 608
$E_t E_{t-5}$	13 434 502	13 201 769
$E_t E_{t-4}$	12 233 505	12 190 651
$E_t E_{t-3}$	12 595 102	12 208 055
$E_t E_{t-2}$	13 142 358	13 015 063
$E_t E_{t-1}$	13 858 818	13 782 114
$E_{t+1} E_t$	12 964 353	12 719 153
$E_{t+2} E_t$	13 482 117	13 278 982
$E_{t+3} E_t$	13 564 098	13 329 592
$E_{t+4} E_t$	13 698 319	13 358 140
$E_{t+5} E_t$	13 327 970	13 154 058
$E_{t+6} E_t$	13 526 428	12 906 504
$E_{t+7} E_t$	13 813 655	13 417 067
$E_{t+8} E_t$	13 740 634	13 236 197

F-test on models, $E_t E_{t-5,}$ trainee commencements

Model	N	No of par	Residual sum squares	F score	sig
Full model with all difference and sq difference terms	168	6	13 201 769		
Restricted model without square terms	168	4	13 434 502	1.428	0.243
Full model with difference terms	168	4	13 434 502		
Restricted model with only employment at t	168	2	14 068 652	3.871	0.023

Appendix B

Table B1 Regression results for change in apprentice and trainee commencements by occupation

Regression results	Coefficient	Standard error	T-value	Sig
Intercept	-57.398	18.632	-3.08	0.061
Percentage change in employment between comparison period and downturn period*	-0.171	0.354	-0.48	0.638
% Existing workers, comparison period	0.256	0.336	0.76	0.466
% Female, comparison period	0.095	0.176	0.54	0.803
% Part-time, comparison period	0.163	0.245	0.67	0.927
Age, comparison period				
% 19 years and under		Reference category		
% 20 to 24 years	1.757	0.685	2.56	0.019
% 25 years and over	-0.252	0.308	-0.82	0.099
Duration, comparison period				
% Less than 1 year	0.303	0.393	0.77	0.810
% Over 1 and up to 3 years	0.452	0.346	1.3	0.193
% Over three years		Reference category		

Note: *The comparison and downturn periods for employment are based on a lead of 4 quarters for trade occupations and a lag of 5 quarters for non-trade occupations.

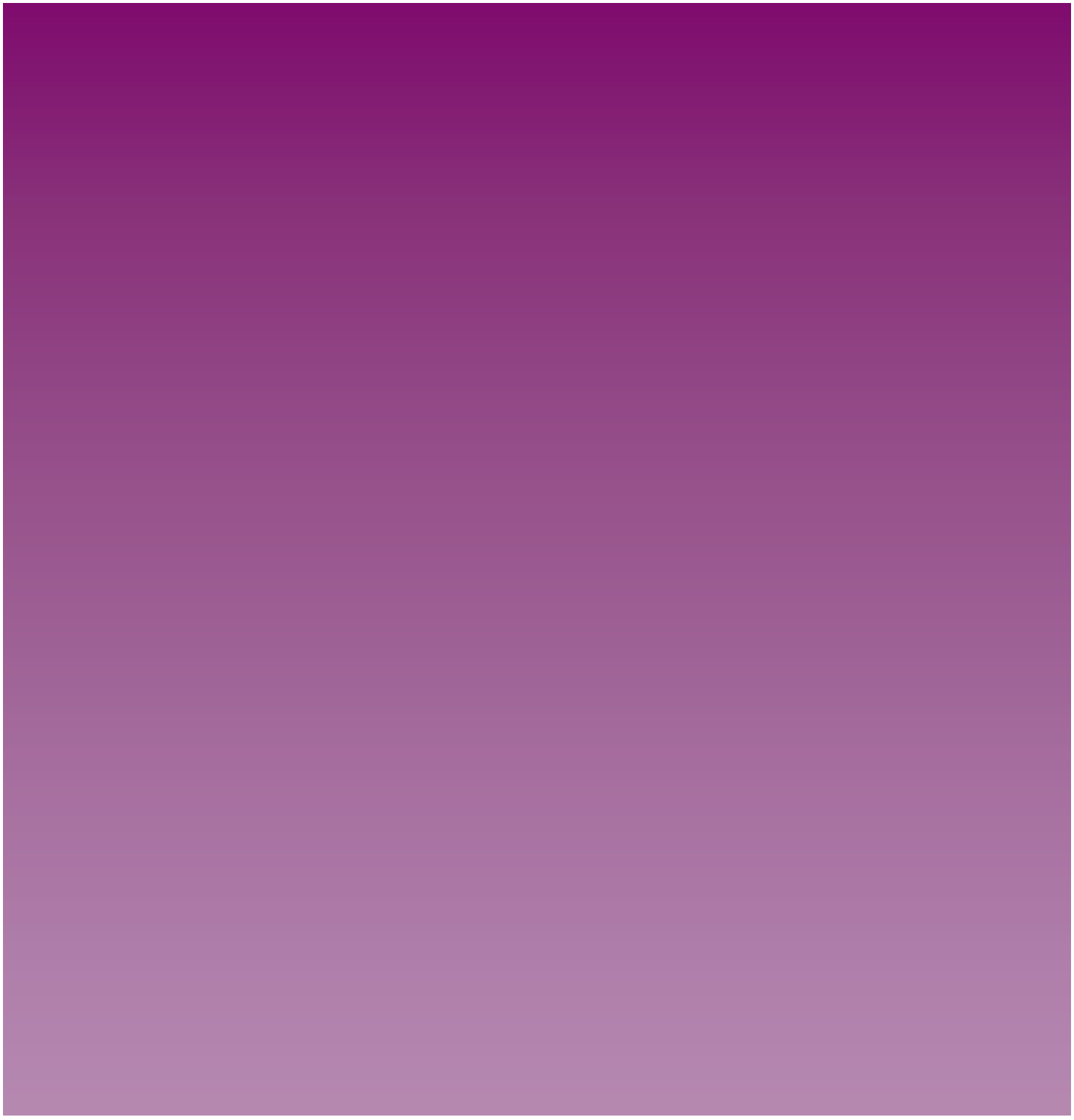
Source: NCVER Apprentices and Trainees Collection; ABS (2003, 2010b).

Table B2 Model summary for regression of change in apprentice and trainee commencements by occupation

Source	DF	Sum of squares	Mean square	F value	Pr > F
Model	8	5 717.021	714.628	1.610	0.165
Error	29	12 878.928	444.101		
Corrected Total	37	18 595.949			
R-Square:	Coeff Var:	Root MSE:	Mean of Per change commencements:		
0.307	-663.785	21.074	-3.175		

Table B3 F-test results for change in apprentice and trainee commencements by occupation

	N	No of par	Residual sum squares	F score	df1	df2	Sig value
A Expanded model with age and duration blocks	38	8	12 878.9				
B Restricted model with no age block	38	6	16 129.6	3.786	2	36	0.032
C Restricted model with no duration block	38	6	14 726.8	2.152	2	36	0.131



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