

Four Yearly Review of Modern Awards – Penalty Rates (the Review)

AM2014/305

02 December 2015

Private and confidential

Mr Nick Tindley
Executive Manager
FCB Group
Level 18, 607 Bourke Street
Melbourne Victoria 3000

02 December 2015

Dear Mr Tindley

Four Yearly Review of Modern Awards – Penalty Rates – AM2014/305 (the Review)

Thank you for appointing me as an expert witness for the above matter.

You have asked me to provide further expert opinion in relation to the report titled "*AM2014/305 Four yearly review of Modern Awards – Penalty Rates (the Review)*" and dated 5 November 2015, being a reply report of Ms Serena Yu of the University of Technology Sydney (Yu Reply Report).

Please find attached my report outlining my response in relation to the Yu Reply Report.

Yours sincerely



Lynne Pezzullo
Partner
Deloitte Access Economics Pty Ltd

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Appendices

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Glossary

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ARA	Australian Retailers Association
DID	difference in difference
GFC	Global Financial Crisis
LHS	left hand side
MGA	Master Grocers Association
NRA	National Retail Association
NSW	New South Wales
OLS	Ordinary Least Squares
RHS	right hand side
VIC	Victoria
WHS	workplace health and safety

1 Introduction

Qualifications and experience

- 1.1 I, Lynne Pezzullo, am the Lead Partner of the Health Economics and Social Policy team in Deloitte Access Economics Pty Ltd (Deloitte) in 1/9 Sydney Avenue, Barton in the Australian Capital Territory, Australia. I am an experienced Economist with over twenty five years of research and consulting experience. Specific and relevant experience includes the following.
- (a) I lead the ACT economics practice for Deloitte Access Economics. The Health Economics and Social Policy team is only part of this practice, with other parts of the practice including macroeconomics, microeconomics and economic modelling.
 - (b) As Managing Partner of Deloitte's ACT office I am also the financial and business manager of the ACT Deloitte office which includes Deloitte's ACT based financial advisory, consulting, risk, assurance and accounting practices.
 - (c) In this role, I provide advice, service and support to most of the Canberra office's clients. Most of these clients are outside of the health sector and include the Hindmarsh Group, Canberra Airport Group and ACTEW AGL. Many of these clients operate in the retail sector.
 - (d) I have undertaken a number of research projects that relate to workforce and related issues faced by the retail sector. Examples include analysis of the optometry workforce for Specsavers and Luxottica, analysis of the dental workforce for the Australian Dental Association, analysis of the GP workforce for the Australian Medical Association, analysis of the physiotherapy workforce for the Australian Physiotherapists Association, analysis of the accredited exercise physiologist workforce and analysis of the fitness industry and its workforce for Fitness Australia.
 - (e) Two examples of work that I have carried out on Award and labour market policy issues include: research for the Australian Nursing Federation (as it then was) in relation to the disparity of wages for nurses working in acute care and aged care in NSW, and the Regulation Impact Statement for the Fair Work Act 2010 (Cth).
 - (f) Two examples of studies I've led in relation to consumer and employee preferences include: Making Choices: Future dementia care: projections, problems and preferences for Alzheimers Australia, which utilised discrete choice modelling techniques to rank preferences; and a number of Regulation Impact Statements for SafeWork Australia in relation to workplace health and safety ('WHS'), including the RIS of the Harmonisation of WHS, which included substantial consultation with employees and their union representatives through mixed methods approaches to determine impacts of and views about proposed regulatory changes from the perspectives of industry, regulators and workers.
- 1.2 My curriculum vitae is attached at **Appendix 1**.

My instructions

- 1.3 I have been engaged by Mr Nick Tindley (FCB Group), the lawyers acting on behalf of the Australian Retailers Association (ARA), Master Grocers Association (MGA) and National Retail Association (NRA) in the Four Yearly Review of Modern Awards – Penalty Rates – AM2014/305 (the **Review**).
- 1.4 Ms Serena Yu of the University of Sydney Business School has authored a report “Evaluating the impact of Sunday Penalty Rates in the NSW Retail Industry” dated 1 September 2015 (**Yu Report**) which has been submitted to the Fair Work Commission.
- 1.5 I was previously instructed to provide a written report containing my opinion of the Yu Report which was provided on 2 November 2015, titled “*Four Yearly Review of Modern Awards – Penalty Rates (the Review): AM2014/305*” (**my First Report**).
- 1.6 Ms Serena Yu subsequently prepared a report dated 5 November 2015 titled “*AM2014/305 Four yearly review of Modern Awards – Penalty Rates (the Review)*” setting out her opinions in respect of my First Report (**Yu Reply Report**).
- 1.7 In response, I have been instructed to provide a short written report containing my technical response to the Yu Reply Report and including the provision of a correctly specified Chow test on the Australian Bureau of Statistics (ABS) data to contrast the findings with those of the Yu Report.
- 1.8 I provide my letter of instruction as **Exhibit A** to this report¹.
- 1.9 Any other assumptions that I have chosen to adopt and the reasons for my choice are set out in the body of my report.

Sources of information

- 1.10 I set out at **Appendix 2** a list of the documents on which I have relied in the preparation of this report. In addition, where I rely on publicly available material, I provide the source as an exhibit to this report or identify the website address.
- 1.11 The factual matters in my report are referenced to their source in the instructional documents or elsewhere, except that the summary of my conclusions (Section 2) is not so referenced.

Structure of this report

- 1.12 In Section 2, I set out a summary of my conclusions.
- 1.13 In Section 3, I outline my opinions on the Yu Reply Report.
- 1.14 In Section 4, I set out the relevant declarations and also the limitations of the use of this report.

¹ Letter of instruction dated 18 November 2015.

2 Summary of conclusions

2.1 I have reviewed the Yu Reply Report, together with the Yu Report and my First Report, and I summarised my responses as follows.

- (a) Trends and empirical strategy: I reject the claim by Yu in her Reply Report that I have misunderstood her model. I set out various examples in this report, including a revised model, to indicate that there was indeed a structural break in trends, which renders her use of difference in difference (DID) model invalid. Yu's description of empirical strategy in both the Yu Report and the Yu Reply Report was not what she has implemented and estimated. Importantly, given the null hypothesis is that the Award changes to penalty rates in New South Wales had no impact on levels of retail employment or hours worked, it is my opinion that it is not appropriate to test changes each year compared to the one before, as this dilutes the total impact and makes it less likely to be able to statistically show impact overall. Her analysis, while not optimally specified, nonetheless demonstrated there was a statistically significant reduction in employment as a result of the introduction of Award changes, occurring in the first year. The analysis I present in this report shows that, if the impact is correctly modelled, it also reveals a statistically significant and enduring reduction in both employment and hours worked resulting from the Award changes.
- (b) Statistical tests, endogeneity and multicollinearity: I also reject Yu's claim that my First Report had suggested a long list of irrelevant specification tests, one of which is the existence of serial correlation that can invalidate a conclusion due to incorrect standard errors being estimated. The tests I recommended in my First Report are standard, valid tests that should be conducted, as evidenced in that report from the econometric literature. Peer reviewers not providing Yu with such comments, as Yu states in her Reply Report, may reflect a number of factors, but does not negate the need for such tests to demonstrate robustness of analysis.

3 My response to the Yu Reply Report

3.1 In this section, I set out my comments in relation to the Yu Reply Report with reference to the Yu Report and my First Report. I have not retyped sections of text from those reports for expediency, so this report needs to be read in conjunction with the previous reports.

Trend testing and the empirical strategy, the flaws in Yu's model

3.2 Responding to the Yu Reply Report paragraph 7 part (a):

(a) The basic questions are whether the trends are the same in NSW and Victoria in the 'before' period and what happens to the trends in NSW and Victoria in the 'after' period. Figures 3.1 and 3.2 in my First Report suggest that the trends could be different.

(b) Consider now equation (1) in the Yu Report, repeated below for ease of reference,

$$y_{st} = \alpha_s + \gamma t + \sum_{k=1}^5 \beta_k D_{sk} + \delta X_{st} + \varepsilon_{st}$$

The D_{sk} dummies are equal to 1 only for NSW, so the model for Victoria is obtained by setting the D_{sk} dummies equal to zero. That gives,

$$y_{VIC,t} = \alpha_{VIC} + \gamma t + \delta X_{VIC,t} + \varepsilon_{VIC,t}$$

(c) None of the parameters in this equation are different in the 'before' and 'after' periods. In other words, **the model for Victoria in the Yu Report is assumed to be the same in the 'before' and 'after' periods**. Given that assumption, which is not tested, it is quite appropriate for my First Report to consider the trends in Victoria in both the 'before' and 'after' period.

(d) Moreover, in Yu's equation (1), the D_{sk} dummy variables are not interacted with any other variables, so the equation is only allowing for changes in the intercept for NSW. In particular, the D_{sk} are not interacted with the trend term, so **the equation does not allow a change in the slope of the trend for NSW**. In my opinion, that shows that the basic interpretations of the model in the Yu Report and Yu Reply Report, such as those around Figure 1 in the Yu Report, are incorrect.

3.3 Responding to the Yu Reply Report paragraph 7 part (b):

(a) Visual inspection of data is a valid and important part of any statistical analysis, and there are good reasons to consider a break in 2008, such as the announcements about the introduction of the modern awards and the onset of the Global Financial Crisis (GFC). In my opinion, these factors would not be considered 'arbitrary'.

(b) I consider the last sentence in the paragraph surprising – either one is testing a hypothesis or one is not, and a 'close enough' (my expression) analysis like this is not standard in the econometrics literature. The Yu Reply Report does not define 'close enough' ('not... precisely the same' in her terms), does not show that the trends satisfy her implicit definition of 'close enough' and does not show that assuming that they are 'close enough' does not invalidate the results. **Yu should have tested the hypothesis about equal**

trends. I undertake this testing below and demonstrate statistically that the trends are indeed not equal, as implicated by the slope analysis in my First Report.

- (c) The regression lines in the Yu Reply Report Figures 1 and 2 are different from those for the 'before' period in my First Report Figures 3.1 and 3.2. Rather than arising from "Pezzullo's errors", the differences arise from the use of different data. Yu uses ABS 6291.0.55.003 May 2015 and my First Report use ABS 6291.0.55.003 August 2015. Furthermore, the Yu Reply Report considers the period 2000-2010 whereas my First Report split the period in 2008 reflecting the announcement and actual implementation of the Modern Awards.
- (d) The critical question remains, is there a trend-break in the NSW data? Regressing the NSW employed person data (i.e. dependent variable denoted as NSW_EMP in Table 3.1) on a time trend using the August 2015 ABS data gives the results in Table 3.1. The time trend is denoted by TT, and TT = 1 in February quarter 2000, = 2 in May quarter 2000 and so on for subsequent quarters.²

Table 3.1 Results from regressing NSW employed person data on a time trend

Dependent Variable: NSW_EMP				
Method: Least Squares				
Sample: 2/01/2000 5/01/2010				
Included observations: 42				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	250.3042	17.22197	14.53401	0.0000
TT	1.320480	0.209014	6.317674	0.0000
R-squared	0.499456	Mean dependent var		357.9234
Adjusted R-squared	0.486942	S.D. dependent var		22.92195
S.E. of regression	16.41855	Akaike info criterion		8.481149
Sum squared resid	10782.75	Schwarz criterion		8.563895
Log likelihood	-176.1041	Hannan-Quinn criterion		8.511479
F-statistic	39.91300	Durbin-Watson statistic		0.991985
Prob(F-statistic)	0.000000			

- (e) Applying the Quandt-Andrews unknown breakpoint test³ to my model gives the results in Table 3.2, which in my opinion **strongly suggest that there is a break in the trend, at around the end of 2007**. The relevant p-value is in bold, as is the suggested breakpoint (i.e. November 2007 quarter).

² The intercept and particularly the slope are quite different from those in Yu and Pezzullo because of different definitions of the time trend. In those results, TT = 36,557 in 2/01/2000, = 36,647 in 5/01/2000 and so on, which follows from the treatment of dates in Excel. Quarters are depicted using the form 2/01/2000 for February 2000 and 5/01/2010 for May 2010, for example.

³ The Quandt-Andrews unknown breakpoint test performs a series of Chow breakpoint tests, each allowing a breakpoint at a different observation, and calculates the maximum of the Chow test statistics. In the table below, the breakpoints are allowed at every observation in the interval 11/01/2001 to 11/01/2008.

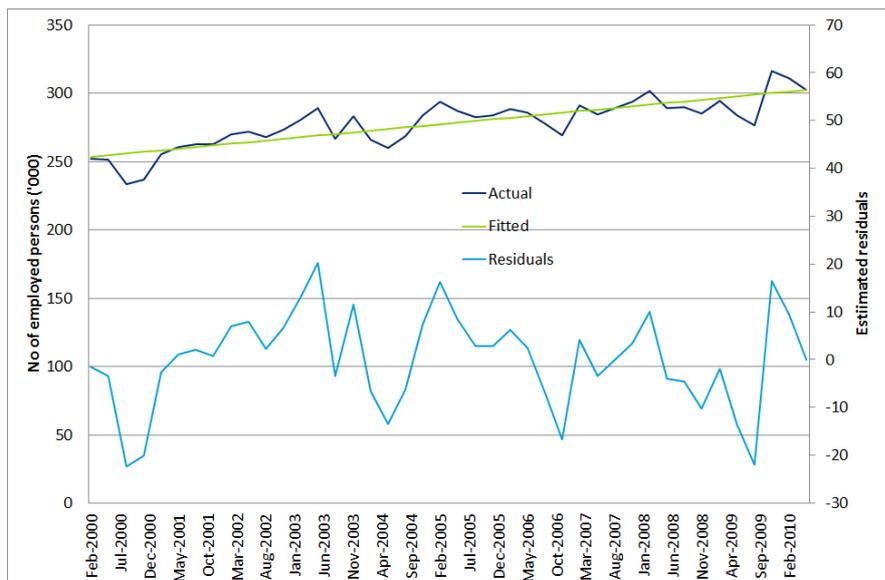
Table 3.2 Quandt-Andrews unknown breakpoint test

Quandt-Andrews unknown breakpoint test		
Null Hypothesis: No breakpoints within 15% trimmed data		
Varying regressors: All equation variables		
Equation Sample: 2/01/2000 5/01/2010		
Test Sample: 11/01/2001 11/01/2008		
Number of breaks compared: 29		
Statistic	Value	Prob.
Maximum LR F-statistic (11/01/2007)	20.18762	0.0000
Maximum Wald F-statistic (11/01/2007)	40.37524	0.0000
Exp LR F-statistic	7.529923	0.0000
Exp Wald F-statistic	17.13659	0.0000
Ave LR F-statistic	8.673456	0.0001
Ave Wald F-statistic	17.34691	0.0001

Note: probabilities calculated using Hansen's (1997) method.

- (f) Since serial correlation in the residuals in the regression model (see the Durbin-Watson statistics in Table 3.1) invalidates the p-value in the Quandt-Andrews test, the p-value is very small and, as I show later in Section 4, the serial correlation is not present in models that allow a breakpoint in 2008.⁴
- (g) The corresponding test for Victoria suggests a breakpoint in 2003 (p-value 0.03), indicating **a further problem with the Yu Reply Report modelling – the sample period commences with the year in which the GST was introduced**. The dips in actual employment and the residual in mid-2000 and the peaks in 2003 show visually in Figure 3.1 why the Quandt-Andrews test finds a break in 2003.

Figure 3.1 Regression of employment on a linear time trend, Victoria



Source: ABS (2015)

⁴ Adding a lagged dependent variable to the model eliminates the serial correlation in the residuals, and the conclusion in the Quandt-Andrews test is the same.

- (h) Commencing the analysis in 2001 removes the effects of the introduction of the GST on the data. Then the Quandt-Andrews unknown breakpoint test does not find a break in the Victorian employment model (the p-value of the maximum F-statistic equals 0.46), while for NSW, the conclusion is unchanged from that discussed above i.e. there remains a break in the NSW data.
- (i) Returning to the question of whether the trends are the same in NSW and Victoria in the 'before' period, the break in the NSW model implies that it is not appropriate to simply compare the trends in the 'before' period, as the Yu Report and Yu Reply Report do. That is, in my opinion **the trend in NSW is really made up of two distinct trends and the linear trend assumption is thus not valid.**
- (j) I define the dummy variable $D_{2008} = 1$ from August 2008 to May 2015, and $D_{2008} = 0$ otherwise, which allows for a break in the trend at August 2008. Then, testing the hypothesis that the pre-August 2008 trend is the same in NSW and Victoria rejects the null hypothesis with a p-value of 0.005. In other words, the trends are not 'close enough'.

3.4 Responding to the Yu Reply Report paragraph 8 part (a).

- (a) A structural change may be estimated using only data from NSW from before the break – it is not actually necessary to use the Victorian data. The Victorian data are potentially useful if there is a change in the NSW model due to another factor or factors, at exactly the time of the Sunday penalty rate change. If there is no change in the Victorian model from the same factor(s), then one may conclude that the change in the NSW model is due to the Sunday penalty rate change. The flaw in Yu's analysis, as I have discussed above, is that her model does not allow for the possibility of any change in Victoria, for example due to Australia-wide macroeconomic factors such as the GFC impact.
- (b) The quote from Imbens and Wooldridge (2009), about differencing of the states' outcomes "remov[ing]...biases from comparisons over time in the treatment group that could be a result of time trends unrelated to the treatment" is taken out of context. They are discussing a model on two cross-sections in different time periods, and are commenting on changes between the two periods. There is no time trend in their model.

3.5 Responding to the Yu Reply Report paragraph 8 part (b).

- (a) Yu misunderstands the point made in my First Report. I was suggesting that other states and territories be compared to Victoria, not just NSW, if there is no change in Victoria.
- (b) Attempting to measure the impact of a policy change (i.e. change in penalty rates) among many other factors is a challenging task. Yu herself in her reply indicated that there were variable changes in Sunday penalty rates (as well as other conditions) across the states. Therefore, one should not ignore other states' data. This was my point and it would be valuable to conduct such analysis.

3.6 Responding to the Yu Reply Report paragraph 8 part (c).

- (a) The basic DID model (e.g., Imbens and Wooldridge (2009)) is given by

$$Y_i = \alpha + \beta_1 T_i + \gamma_1 G_i + \tau_{DID} T_i G_i + \varepsilon_i$$

where T is the time indicator (=1 in the 'after' period and = 0 in the 'before' period) and G is the group indicator (=1 for NSW and = 0 for Victoria in the current context). This basic model allows a different parameter in the two groups in the two periods (effectively, there are no slopes in this simple model, only intercepts).

- (b) This basic model can be estimated by Ordinary Least Squares (OLS) on pooled data from the two groups, or the estimates can be obtained by running separate regressions on the two groups and transforming the estimates. The two separate regressions are of the form:

$$Y_{s,i} = \delta_{s,1} + \delta_{s,2} T_i + \varepsilon_{s,i}$$

- (c) In both cases, four parameters are estimated. The second approach is equivalent to having different models for the different states. I reject Yu's assertion that my First Report misunderstands DID. The pooled regression is used because it gives a direct estimate of the relevant DID parameter (τ_{DID}).
- (d) The situation changes when there are additional parameters on additional control variables. Efficiency is gained if those parameters are the same in the two groups (states) and the data are pooled. But Yu does not test that those parameters are the same in the two states, in either her Report or her Reply Report.
- (e) The coefficient on the interaction term is the relevant DID parameter (τ_{DID}). But that is only the case if the model contains both the time and group indicators. Yu's equation (1) does not include the equivalent of T_i , a dummy variable for the 'after' period, so her regression results do not give the DID estimate.

3.7 Responding to the Yu Reply Report paragraph 9.

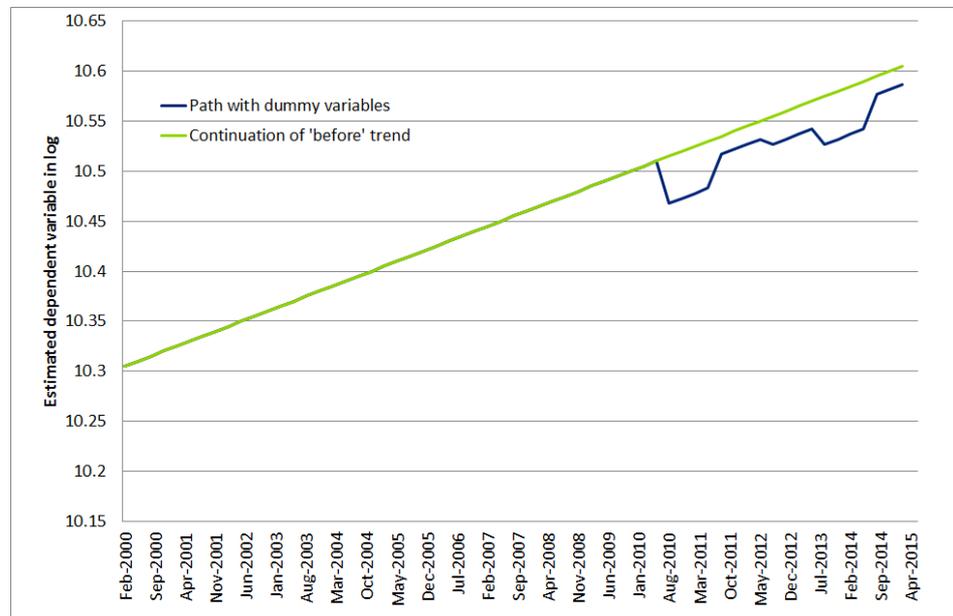
- (a) Yu's equation (2) and Table 4 in the Yu Report do not include period-specific effects. As noted in paragraph 3.6 above, without those effects, estimation of the model does not give the DID estimator. The context is that if Yu is not doing DID, OLS is not the same as fixed effects.
- (b) Paragraph 12 (h), the final paragraph, of the Yu Reply Report states that the model included wave dummy variables. It was not possible to know that the model contained wave dummies since there was no reference to them and they were omitted from the equations.
- (c) Paragraph 12 (h) also states that the wave dummies entered in the form of a time trend. With more than two waves, using a time trend is not the same as including wave dummies. For example, the time trend uses one parameter t with seven observations (t1, t2, t3, t4, t5, t6, t7), whereas seven wave dummies would use six parameters W2, W3, W4, W5, W6 and W7, each with binary values of only 0 or 1 and with coefficients that can be estimated relative to W1.
- (d) Even more important is the specification of the D_{sk} dummy variables.

- (i) The five D_{sk} dummy variables allow for different effects in the five periods starting July 1, 2010 - July 1, 2014. Using the results from Table 3 of the Yu report, I have illustrated the impact of the dummies (i.e. without the X variables and error terms) in Figure 3.2, which could also be expressed mathematically as:

$$y_{NSW,t} = 10 + 0.005t - 0.047D_{NSW,1} + 0.029D_{NSW,2} - 0.010D_{NSW,3} - 0.020D_{NSW,4} + 0.030D_{NSW,5}$$

- (ii) The blue line on Figure 3.2 shows the path implied by the dummy variables. The green line continues the trend from the 'before' period. Yu's model shows that the trend in the blue line is only significantly different from the trend in the green line in the first year. However, the -0.047 in the first 'after' year dominates, i.e. the blue line is consistently below the green line. **Thus, even in terms of Yu's model, the introduction of Sunday penalty rates has an effect of lowering employment that persists, due to the statistically significant impact in the first year.**

Figure 3.2 Results based on the empirical strategy of Yu Report



Source: ABS (2015)

- (iii) Yu's Reply shows that my First Report's Figure 3.5 is correct. Just having the D_{sk} dummy variables in the model gives intercept shifts but not a trend shift; and, as stated in my First Report, the trend within each of the 'after' years is determined by the γ parameter. In order to allow for changes in the trend, it is necessary to interact the D_{sk} dummy variables with the time trend.
- (iv) The D_{sk} variables have an explicit state index (s). However, the written definition in the Yu Report equation (1) states that the D_{sk} variables only apply to $s = NSW$ (refer to my paragraph 3.2 above). Either:
- Yu's models did not contain the dummy variables for $s = Victoria$, in which case the comments above – that the model does not allow a change in Victoria between the 'before' and 'after' period, which is a crucial part of the DID procedure – apply; or,

- The model did contain those variables, but they are not reported in Yu's tables and comments, in which case the model is not equivalent to the basic DID model in paragraph 3.6 (a) above, and the parameters on the D_{sk} variables for NSW are not the relevant DID parameters.

Yu's secondary comments

3.8 Responding to the Yu Reply Report paragraph 11, part (a).

- True, the placebo tests presented in the Yu Report do not invalidate the model's findings. My First Report did not state that they did. I consider that the tests based on the placebo models are simply very weak tests.
- There was a 19 out of 20 chance that the tests in the placebo model would not find an effect, so it is not surprising that they did not find an effect. More generally, the analysis of a testing procedure should investigate the probabilities of both type I and type II errors – whether the procedure finds an effect when none is present (type I error, as in Yu's placebo model) and whether the procedure fails to find an effect when one is present (type II error, not investigated by Yu). It is the type II error that is of most relevance here, since Yu argues there is no effect on employment from the Award changes.

3.9 Responding to the Yu Reply Report paragraph 11, part (b).

- It would have been beneficial if the results of this verification work had been provided as an appendix, so that the reader could conclude for themselves whether the differences in their results are material or not.

3.10 Responding to the Yu Reply Report paragraph 11, part (c).

- It was stressed in my First Report that serial correlation in residuals may be an indicator of model misspecification, whereas Yu focuses on the case of correct specification and then uses further techniques (distributed models of lags) to correct for the serial correlation she found in the errors after conducting the suggested test. **Nonetheless, the finding of this expected serial correlation is further evidence of model mis-specification.**
- In Section 4, I also show the results from an alternative model where there is no serial correlation in the residuals. The crucial step in obtaining that result is allowing for a structural break in 2008. Yu does not allow such a break, as noted above.

3.11 Responding to the Yu Reply Report paragraph 11, part (d).

- Yu does not appear to understand my concern in relation to the existence of a structural break (see my comments in paragraph 3.3 above).

3.12 Responding to the Yu Reply Report paragraph 11, part (f).

- Studies using DID do not account for non-stationary processes when the data are made up of a series of cross-sections or a panel (e.g. Atalay and Barrett 2014). Studies on repeated cross sections or panel data may include wave dummy variables, which partial-

out the changing means of the explanatory variables; and the number of observations in the time dimension is too small to test for non-stationarity.

- (b) Yu needs to consider DID-type studies on time series data since, beginning with the seminal work of Granger and Newbold (1974), it has been known that running regressions on non-stationary data can lead to spurious results. Wooldridge also discusses this in his textbook (Wooldridge, 2013, p 645).

3.13 Responding to the Yu Reply Report paragraph 11, part (g).

- (a) The retail sales data are monthly (see paragraph 12 (f) in the Yu Reply Report). The ABS does not appear to publish real monthly data (only quarterly). But ABS 8501, Table 3, contains both original and seasonally adjusted data. Yu does not state which of those she used, however the presence of the seasonal dummy variables in Table 3 of the Yu Report suggests that she used original data. There is little seasonality in the quarterly labour force data (especially employment – since the December/January period smooths out in quarterly data), so the seasonal dummy variables may be in the model to allow for the seasonality in the retail sales data (especially the month of December). An alternative is simply to use the seasonally adjusted retail series and not use the seasonal dummy variables.
- (b) For NSW retail data, different results are obtained in the Augmented Dickey Fuller tests in the seasonally adjusted and unadjusted data. In particular, the standard Augmented Dickey Fuller tests assume no seasonality and may lose power in the presence of seasonality (because the tests must add extra variables to allow for the seasonality; eight variables are added in the test on the NSW data). This may explain the different results in the seasonally adjusted and unadjusted data.

3.14 Responding to the Yu Reply Report paragraph 11, parts (h), (i), (j) and (k) and paragraph 12 parts (a) and (b).

- (a) The testing for endogeneity confirms the strong statistically significant impact of the Award changes on the overall employment impact. The test for multicollinearity shows that multicollinearity does exist, as expected, with its associated weaknesses. The other matters in the final sections of paragraph 11 and the first sections of paragraph 12 (the now tested existence of autocorrelation, time trend problems and the specification of dummies) have been dealt with in the discussion above, and all three remain serious issues demonstrating mis-specification.

3.15 Responding to the Yu Reply Report paragraph 12 part (b), (c) and (d).

- (a) Refer to paragraph 3.7 above for my comment. There is no term in Yu's equation (1) to introduce a change in the slope of the trend depicted in Figure 3 of the Yu Reply Report. Hence my graphic representation is correct (and labelled correctly from Excel to Word).

3.16 Responding to the Yu Reply Report paragraph 12 part (e).

- (a) Yu refers to footnote 13 on p.20 in the Yu Report. There is no footnote 13 although there is a footnote 12 on that page which says "The model uses the logarithm of total employment

and total hours". It is still not clear whether the sales data are transformed (natural logarithm), although the size of the coefficients on sales in Table 3 suggests the retail sales data are also logged.

3.17 Responding to the Yu Reply Report paragraph 12 parts (f), (g) and (h).

- (a) Re (f), removing retail sales may introduce omitted variable bias, and does not accord with economic theory (see paragraphs 4.2 and 4.3 below).
- (b) Re (g), the linear probability model is a model, not an estimation technique. It may be estimated by OLS, but there are other estimation options in a panel (e.g. fixed effects, random effects, instrumental variables) and the best estimation technique depends on the situation.
- (c) Re (h), see paragraph 3.7 above.

3.18 Responding to the Yu Reply Report paragraph 17.

- (a) As explained in my First Report paragraph 3.31, there is a strong econometric reason for excluding the employment variables in the right hand side, being that the reverse causality (endogeneity) may lead to bias in the OLS estimators.

4 A revised modelling approach

- 4.1 In this section, I focus on employment impacts from the NSW Award and develop an alternative modelling approach to that in the Yu Report.

Economic basis of the revised modelling

- 4.2 The Yu Reply Report states (paragraph 12 (f)) that “Retail sales is included in the DID model as a control for industry demand.”
- 4.3 Indeed, many economic models of the demand for labour (employment) have industry demand as an explanatory variable, with the relationship between employment and industry demand depending on the price of labour. These models predict on the basis of economic theory that an increase in the price of labour leads to a decrease in employment (other things equal).
- 4.4 A change in the price of labour, such as the increase in Sunday penalty rates, may therefore change the relationship between industry demand and employment – a structural change. Rather than focussing on this relationship, Yu focusses on the intercept in the employment and hours equations.
- 4.5 In this context, the trends in employment and hours basically follow the trends in retail sales and the price of labour. Neither the Yu Report nor the Yu Report Reply explain why there is a time trend in the model. For example, in the absence of a variable for the price of labour, the time trend could be a proxy for the price of labour. Or it could represent the effects of unobserved variables, such as the prices of other inputs or changing consumer patterns.

Continuous variables used in the revised modelling

- 4.6 The revised modelling uses the natural logarithm of employment as the dependant variable.
- 4.7 Monthly seasonally adjusted nominal retail sales data are used and lagged one month (e.g. labour force data are August, sales data are July). Because the data are seasonally adjusted, seasonal dummy variables are not needed.
- 4.8 The retail sales data are nominal (since no real monthly data are published). The data may not be stationary around a trend, so we are treating the results as conditional on the RHS data. The natural logarithm of the data is used.
- 4.9 The data are from ABS 6291.0.55.003 August 2015.

Modelling strategy

- 4.10 Separate models are estimated for NSW and Victoria. As explained above, simply pooling the data gives the same results, and it may not be appropriate to allow common parameters on the trends and control variables in the two models.
- 4.11 The modelling approach allows for potential changes between the ‘before’ and ‘after’ periods, so under the null hypothesis that the NSW Sunday penalty rate changes had no effect, the changes in the models between the ‘before’ and ‘after’ periods should be the same in NSW and Victoria.

- 4.12 The modelling uses structural change tests and dummy variables to represent the impact of the policy change (e.g. Asteriou and Hall 2011, p 219) and to allow for structural breaks in the intercepts and slope coefficients at the start of the 'after' period, July 2010. Define the dummy variable,

$$D2010 = 1 \text{ in the 'after' period, } = 0 \text{ otherwise.}$$

This dummy variable is the same as Yu's $D_{s,1}$. But note that the models allow for changes in the trends, rather than a series of steps changes in the intercepts as in the Yu Report.

- 4.13 The modelling also includes the breaks associated with the exposure draft of the Retail Industry Award (2010). Define the dummy variable,

$$D2008 = 1 \text{ after July 2008, } = 0 \text{ otherwise.}$$

- 4.14 The basic model allows for potential changes in the intercepts and slopes in 2008 and 2010.

$$y_{s,t} = \alpha_s + \delta_s \log(\text{Sales})_{s,t} + \beta_{s,1} D2008_t + \beta_{s,2} D2008_t * \log(\text{Sales})_{s,t} + \beta_{s,3} D2010_t + \beta_{s,4} D2010_t * \log(\text{Sales})_{s,t} + \beta_{s,5} TT_t + \beta_{s,6} D2008_t * TT_t + \beta_{s,7} D2010_t * TT_t + \varepsilon_{s,t}$$

where y is $\log(\text{employment})$ and TT is the time trend, = 1 in 2/01/2000, = 2 in 5/01/2000 and so on. For example, if the coefficients on all the $D2008$ and $D2010$ terms are equal to zero, then there are no changes in the models post-2008 and 2010.

Results

- 4.15 The results in the basic model are shown in first two tables below.
- 4.16 There is no evidence of serial correlation in the NSW model; for example, the Durbin-Watson statistic is close to two. Indeed, removing the 2008 terms from that model gives a model with serial correlation in the residuals, suggesting that the serial correlation in Yu's models reflects misspecification of her model around that issue of the structural break in 2008.
- 4.17 Heteroskedasticity-consistent standard errors are generally smaller than those in the table, so I consider that the tests are conservative.

Table 4.1 Full model – NSW

Dependent Variable: LOG(EMPLOYMENT)				
Method: Least Squares				
Sample: 2/01/2001 5/01/2015				
Included observations: 58				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	8.772434	3.313135	2.647775	0.0109
LOG(SALES)	-0.439291	0.438246	-1.002385	0.3211
D2008	-4.478367	7.423637	-0.603258	0.5491
D2008*LOG(SALES)	0.827838	1.015579	0.815139	0.4189
D2010	3.984506	7.232318	0.550931	0.5842
D2010*LOG(SALES)	-0.732081	0.990804	-0.738876	0.4635

Dependent Variable: LOG(EMPLOYMENT)				
TT	0.010594	0.005173	2.047909	0.0459
TT*D2008	-0.028563	0.015533	-1.838844	0.0720
TT*D2010	0.023889	0.015296	1.561756	0.1248
R-squared	0.608817	Mean dependent var		5.898045
Adjusted R-squared	0.544950	S.D. dependent var		0.050412
S.E. of regression	0.034007	Akaike info criterion		-3.782801
Sum squared resid	0.056666	Schwarz criterion		-3.463077
Log likelihood	118.7012	Hannan-Quinn criterion		-3.658262
F-statistic	9.532618	Durbin-Watson statistic		1.898284
Prob(F-statistic)	0.000000			

Table 4.2 Full model – Victoria

Dependent Variable: LOG(EMPLOYMENT)				
Method: Least Squares				
Sample: 2/01/2001 5/01/2015				
Included observations: 58				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	5.626947	2.170006	2.593056	0.0125
LOG(SALES)	-0.041692	0.303467	-0.137386	0.8913
D2008	5.943799	7.055328	0.842455	0.4036
D2008*LOG(SALES)	-0.918581	0.970391	-0.946609	0.3485
D2010	-9.341001	7.550699	-1.237104	0.2219
D2010*LOG(SALES)	1.369791	1.023389	1.338486	0.1869
TT	0.004321	0.004249	1.017138	0.3141
TT*D2008	0.018722	0.013321	1.405445	0.1662
TT*D2010	-0.023155	0.013123	-1.764443	0.0839
R-squared	0.787743	Mean dependent var		5.674717
Adjusted R-squared	0.753088	S.D. dependent var		0.067737
S.E. of regression	0.033659	Akaike info criterion		-3.803370
Sum squared resid	0.055512	Schwarz criterion		-3.483646
Log likelihood	119.2977	Hannan-Quinn criterion		-3.678831
F-statistic	22.73148	Durbin-Watson statistic		1.664391
Prob(F-statistic)	0.000000			

- 4.18 The very high correlation between the sales variables and the time trend suggest issues in interpreting the individual coefficients, and hence I have not used the time trend variables. The results are shown in the following two tables.

Table 4.3 Model without time trend terms – NSW

Dependent Variable: LOG(EMPLOYMENT)				
Method: Least Squares				
Sample: 2/01/2001 5/01/2015				
Included observations: 58				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.070190	0.537738	3.849809	0.0003
LOG(SALES)	0.449526	0.063347	7.096254	0.0000
D2008	9.583063	3.024638	3.168333	0.0026
D2008*LOG(SALES)	-1.110372	0.347955	-3.191142	0.0024
D2010	-6.971502	3.152046	-2.211739	0.0314
D2010*LOG(SALES)	0.800511	0.361781	2.212694	0.0313
R-squared	0.548939	Mean dependent var		5.898045
Adjusted R-squared	0.505568	S.D. dependent var		0.050412
S.E. of regression	0.035448	Akaike info criterion		-3.743823
Sum squared resid	0.065340	Schwarz criterion		-3.530673
Log likelihood	114.5709	Hannan-Quinn criterion		-3.660797
F-statistic	12.65674	Durbin-Watson statistic		1.825145
Prob(F-statistic)	0.000000			

Table 4.4 Model without time trend terms – Victoria

Dependent Variable: LOG(EMPLOYMENT)				
Method: Least Squares				
Sample: 2/01/2001 5/01/2015				
Included observations: 58				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.461128	0.423657	8.169653	0.0000
LOG(SALES)	0.262635	0.051374	5.112232	0.0000
D2008	-2.642012	3.289290	-0.803216	0.4255
D2008*LOG(SALES)	0.310453	0.387527	0.801112	0.4267
D2010	1.508926	3.555230	0.424424	0.6730
D2010*LOG(SALES)	-0.176444	0.417763	-0.422353	0.6745
R-squared	0.768827	Mean dependent var		5.674717
Adjusted R-squared	0.746599	S.D. dependent var		0.067737
S.E. of regression	0.034098	Akaike info criterion		-3.821451
Sum squared resid	0.060460	Schwarz criterion		-3.608301
Log likelihood	116.8221	Hannan-Quinn criterion		-3.738425
F-statistic	34.58791	Durbin-Watson statistic		1.546839
Prob(F-statistic)	0.000000			

4.19 The point estimates of the slopes conform to the basic patterns shown in Figures 3.1 and 3.2 of my First Report. In the NSW model, employment rises pre-2008, falls between 2008 and 2010 and then rises again post-2010.

4.20 Tests for serial correlation indicate there is no serial correlation.⁵

Tests

4.21 Table 4.5 shows the results from a series of hypothesis tests that are interpreted in sections (a) through (g) below:

- (a) That there was a structural break in 2008: The tests reject the null hypothesis (at the 5% level) that there was no break in NSW, but do not reject the null hypothesis for Victoria. In other words, the model suggests **there was a structural change in 2008 in NSW, but not in Victoria.**
- (b) That there was a structural break in 2010: The tests reject the null hypothesis (at the 5% level) that there was no break in NSW, but do not reject the null hypothesis for Victoria. In other words, the model suggests **there was a structural change in 2010 in NSW, but not in Victoria.**
- (c) That the slope on retail sales is the same post-2010 as it was pre-2008 (in which case the change to Sunday penalty rates has had no lasting effect): The test rejects the null hypothesis (at the 5% level) that the slopes are the same in NSW – the slope appears to be smaller post-2010. In other words, the model suggests that **increases in retail sales are translating into smaller increases in employment in NSW after the Award changes.** The test does not reject the null hypothesis in Victoria.
- (d) That the models (intercepts and slopes) are the same in NSW and Victoria: The test rejects the null hypothesis (at the 5% level) that the two models are the same. In other words, the model suggests that **it is not appropriate to assume the same trends in NSW and Victoria, as Yu has done.**
- (e) That the slope coefficients are the same in NSW and Victoria: The test rejects the null hypothesis (at the 5% level) that the two models are the same. Again, the model suggests it is **not appropriate to constrain the coefficients (specifically) on the control variables to be the same in NSW and Victoria.**
- (f) That the slope coefficient pre-2008 is the same in NSW and Victoria: The test rejects the null hypothesis (at the 5% level) that the two models are the same. **This reinforces the conclusion that it is not appropriate to conclude that the slope coefficients are ‘close enough’.**
- (g) That the slope coefficient post-2010 is the same in NSW and Victoria. The test does not reject the null hypothesis (at the 5% level) that the relationship between employment and sales is the same across in both states. My conclusion is that **behaviour in NSW may have moved towards that in Victoria as Sunday penalty rates in NSW have moved to the level in Victoria.**

⁵ LM test with one lag, p-values = 0.52 in NSW and 0.11 in Victoria.

Table 4.5 Hypothesis test results

		F-stat	p-value
NSW			
(a) Break in 2008	$\beta_1 = 0, \beta_2 = 0$	11.45	0.00
(b) Break in 2010	$\beta_3 = 0, \beta_4 = 0$	2.45	0.09
(c) Slope pre-2008 = slope post-2010	$\beta_2 + \beta_4 = 0$	5.38	0.02
VICTORIA			
(a) Break in 2008	$\beta_1 = 0, \beta_2 = 0$	0.39	0.67
(b) Break in 2010	$\beta_3 = 0, \beta_4 = 0$	0.14	0.86
(c) Slope pre-2008 = slope post-2010	$\beta_2 + \beta_4 = 0$	0.60	0.43
Pooled			
(d) All parameters the same in NSW and Vic		39.86	0.00
(e) Slope parameters the same in NSW and Vic		4.20	0.01
(f) Same slopes pre-2008	$\delta_{NSW} = \delta_{VIC}$	2.29	0.02
(g) Same slopes post-2010	$\delta_{NSW} + \beta_{NSW,2} + \beta_{NSW,4}$ $= \delta_{VIC} + \beta_{VIC,2} + \beta_{VIC,4}$	1.59	0.20

(a) to (g) relate to the interpretations in the sections in paragraph 4.21 above.

5 Declarations and limitations

Method

- 5.1 My conclusions are based on my training and experience as an Economist, the Yu Reply Report provided to me and my consideration of factors that I believe are relevant.

Assistance in the preparation of this report

- 5.2 In arriving at my conclusions in this matter, I have been assisted by Deloitte personnel (employed or subcontracted) who have carried out certain work under my direction. I have reviewed their work in order to form my conclusions. The opinions expressed in this report are my own.

Relationships

- 5.3 Neither Deloitte or I, nor any employees involved in the preparation of this report, are the auditors, tax agents, or accountants for the parties referred in paragraph 1.3 above, nor has Deloitte or any of the aforementioned provided any other professional services to the parties in the past which in our opinion are relevant to our decision to accept this engagement.

Fees

- 5.4 The fees received or receivable in relation to this assignment are based upon agreed hourly rates for time incurred. No part of the fees for this assignment is contingent on the outcome of the Review.

Limitations

- 5.5 This report should not be construed as expressing opinions on matters of law, which are outside my expertise and for the Fair Work Commission to determine. However, it necessarily reflects my understanding thereof.
- 5.6 In preparing my report, I recognise that I am an expert witness, not a witness of fact. My understanding of the relevant facts comes from my instructions and the documents with which I have been provided.
- 5.7 I understand that this report may be made available to the parties involved in this Review, to their advisers and to the Fair Work Commission. It has been prepared for use in this matter. In all other respects, this report is confidential. This report has been prepared for the sole purpose of assisting the Review in consideration of the issues that are the subject of my instruction (set out in paragraphs 1.3 to 1.9) above and should not be distributed to or relied on by any other party for any other purpose. Neither Deloitte, nor any of its employees or agents, accept any liability or responsibility for loss suffered by any party as a result of the circulation, publication, reproduction, or other use of this report.
- 5.8 I reserve the right to review and alter the conclusions reached in this report, should information that is relevant to my assumptions or conclusions come to my attention after the date of this report.
- 5.9 In preparing this report, I have considered the documents and materials set out in Appendix 2. I have not examined original documentation (unless otherwise stated). I have not been asked to, nor have I conducted an audit or otherwise verified the completeness and accuracy of the material

made available to me. Accordingly, I do not accept any responsibility for any errors that result from reliance thereon.

Expert declaration

- 5.10 In preparing this report, I have complied with the requirements of the following professional code of conduct or protocol, being APES 215 *Forensic Accounting Services* issued by the Institute of Chartered Accountants in Australia.
- 5.11 In accordance with APES 215 *Forensic Accounting Services* issued by the Accounting Professional and Ethical Standards Board, I have assessed the professional competence and objectivity of the third parties who have provided opinions and in my opinion, the work performed is appropriate and reasonable.
- 5.12 I have made all the inquiries that I believe are desirable and appropriate and confirm that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the Fair Work Commission.



Lynne Pezzullo

2 December 2015

Appendix 1 - CV of Lynne Pezzullo

Lynne Pezzullo



Lead Partner, Health Economics and Social Policy, Deloitte Access Economics
Managing Partner Canberra, Deloitte Touche Tohmatsu
Adviser to the CEO on Responsible Business

Direct: 02 6175 2000
Email: lpezzullo@deloitte.com.au
Location: Canberra

Lynne Pezzullo has extensive experience in analysis and advice relating to health, economics, social policy and reform

Background

Lynne Pezzullo is the Lead Partner of Health Economics and Social Policy, Deloitte Access Economics Pty Ltd and the Managing Partner of Deloitte Canberra.

Her specialties and capabilities include health, economic and social policy expertise and advice, cost benefit / cost effectiveness analysis, workforce issues, analytical research, intergenerational financing, pharmacoconomics, evaluations and dynamic modelling.

Skills & expertise

- Health reform, financing and insurance
- e-Health
- Workforce analysis
- Acute, primary care and allied health services,
- Social housing, families and Indigenous policy and services analysis
- Aged, disability and other care services
- Health and social policy program and service evaluation
- Cost benefit and cost effectiveness analysis
- Pharmaceuticals and devices – assessments, reimbursement and pricing

Professional and academic qualifications

BEC (First Class Honours), University of Adelaide (1986), PhD ANU (in progress, commenced 2012, Australian Centre for Economic Research in Health and Research School of Population Health)

Reviewer for the Medical Journal of Australia and British Medical

Journal.

Expert advisor to the World Health Organization 2006-2011, and to the ACT NDIS Panel 2012-2014.

ACT Telstra Business Woman of the Year Award, 2008.

Professional experience snapshot

- Mar 11 – current, Lead Partner, Health Economics and Social Policy, DAE
- Sep 11 – current, Managing Partner Canberra, Deloitte Touche Tohmatsu
- Jul 06 – Mar 11, Director, Access Economics Pty Limited, and chair of board
- 2005-06 Associate Director, Access Economics
- 2000-05, Senior Economist, Access Economics
- 1990-96 Director/Executive Office, Department of Foreign Affairs and Trade
- 1989-90 Executive Officer, International Policy Branch, AUSAID
- 1988-89 Senior Research Officer, International Economy Branch, Department of Treasury
- 1987-88 Research Officer, Department of Defence
- 1987-89, Tutor, Department of Economics, Australian National University

Project examples – workforce analyses

- Report for the Department of Health & Human Services, Victoria, *Strategic workforce action plan for real-time prescription monitoring in Victoria* (in progress)
- Report for Royal Australasian College of Physicians, *Physicians of the future – workforce discussion paper* (in progress)
- Report for AHPRA (Australian Health Practitioner Regulation Agency), *Decision Regulation Impact Statement (RIS) on cosmetic medical and surgical procedures and workforce* (in progress)
- Report for Specsavers, *Modelling the Australian optometry workforce* (in progress)
- Report for the Australian Medical Association, *Economic analysis of integrating non-dispensing pharmacists into general practice* (2015)
- Report for Exercise & Sports Science Australia, *Value of Accredited Exercise Physiologists in Australia* (2015)
- Report for the Australian Physiotherapy Association, *Economic analysis of the implications of physiotherapists' prescribing of medication* (2015)
- Report for Accident Compensation Corporation New Zealand, *Workforce health and safety literature search - benefits of evidenced based policy* (2015)
- Report for Meridian Lawyers, *The modern face of weekend work: survey results and analysis* (2014-15)
- Report for Victorian WorkCover Authority, *Reimbursement rates for medical workforce items* (2014)

- Report for Department of Health & Human Services, Victoria, *The Victorian generalist workforce* (2014)
 - Report for Australian Diabetes Educators Association, *Benefits of credentialed diabetes educators (CDEs) to people with diabetes and Australia* (2014)
 - Report for WentWest Limited, *Providing advice on GP practice consolidation trends and workforce remuneration* (2013)
 - Report for Fitness Australia, *Fitness Industry Workforce report:2010-2020* (2013)
 - Report for the Australian Dental Association, *The cost of operating a dental practice in Australia* (2013)
 - Report for Primary Health Care, *Toowoomba special needs: Preliminary Assessment of a District of Workforce Shortage* (2012)
 - Report for Safe Work Australia, *Decision RIS for model Work Health and Safety Regulations and Codes of Practice on Mines* (2012)
 - Report for SafeWork SA, *RIS: Model Work Health and Safety Regulations in South Australia* (2012)
 - Report for Health Workforce Australia, *Evaluation strategy for the Health Workforce Australia Simulated Learning Environments Program* (2012)
 - Report for Fitness Australia, *State of the Industry* (2012)
 - Report for Safe Work Australia, *Decision RIS for National Harmonisation of Work Health and Safety Regulations and Codes of Practice* (2011)
 - Report for Safe Work Australia, *Consultation Regulation Impact Statement for model Work Health and Safety Regulations and Codes of Practice on Mines* (2011)
 - Report for Department of Health (Federal), *Review of the International Recruitment Strategy for medical workforce* (2011)
 - Report for Department of Health (Federal), *Review of Additional Assistance Scheme for GP workforce* (2011).
 - Report for the (then) Department of Employment, Education and Workplace Relations, *RIS for the Fair Work Act 2010 (Cth)* (2010)
 - Report for Safe Work Australia, *Decision RIS for a model Occupational Health and Safety Act* (2009)
 - Report for Australian Nursing Federation, *Nurses in residential care* (2009)
 - Report for Luxottica, *Modelling the optometry workforce* (2006)
- Project examples – substantial modelling components and critiques**
- Report for Department of Social Services, *Evaluation of place-based income management* (2015)
 - Report for Healing Foundation, *CBA of healing programs* (2014)
 - Report for Civil Chaplaincies Advisory Committee (CCAC), *The Economic and Social Benefits of Civil chaplaincies* (2014)
 - Report for The Butterfly Foundation, *Cost effective care models to address eating disorders in Australia* (2014)
 - Report for Baxter Healthcare, *Economic contribution of Baxter Healthcare* (2014)
 - Report for Alzheimer's Australia NSW, *Dementia prevalence estimates and projections* (2014)
 - Report for SmartWard, *Economics Benefits of SmartWard* (2014)

- Report for Australian Society of Anaesthetists, *Review & Critique of Economic Evaluation of Ultrasound Guidance for Major Vascular Access & Percutaneous Neural Blockade in Assessment Report for MSAC application no 1183* (2014)
- Report for Therapeutic Goods Administration, *Regulatory Impact Statement (RIS) for the registration of HIV Home Self-Test (HST) devices in Australia* (2014)
- Report for Healing Foundation, *Prospective cost benefit analysis of healing centres* (2014)
- Report for The Garvan Institute for Medical Research, *Potential Benefits of the Garvan Institute Genomic Medicine Program* (2014)
- Report for National Stroke Foundation, *Understanding stroke impact across Australia* (2014)
- Report for Janssen Pharmaceutical KK Japan, *Economic impact of Hepatitis C and its pharmacotherapies in Japan* (2013-14)
- Report for National Prescribing Service, *Financial & Health Benefits realised from the National Prescribing Service* (2013)
- Report for Novartis Pharma AG, Basel Switzerland, *Burden of eye diseases and preventable blindness in various countries* (2013)
- Report for Department of Health (Federal), *Productivity Benefits of Health Expenditure* (2013)
- Report for Ministry of Social Development NZ, *Peer Review - Estimating costs of family violence in New Zealand* (2013)
- Expert comment for WorkSafe Victoria, *Review and critique of WorkHealth research outputs* (2013)
- Report for Bio Innovation SA, *Economic verification for BioSA* (2013)
- Report for Medicines Australia, *Modelling the impact of variations on PBS pricing policy options* (2013)
- Report for ORYGEN Research Centre, *Review funding modelling for a proposed National System of Youth Mental Health* (2013)
- Report for Specsavers, *Critique of 'The Australian optometric workforce 2009' manuscript (Kiely et al, 2010)* (2011)
- Report for Distilled Spirits Industry Council of Australia, *Review of 'The range and magnitude of alcohol's harm to others'* (2010)
- Report for Accident Compensation Corporation New Zealand, *Peer review of 'Total economic and social cost of injury' study* (2010)
- Report for Medicines Australia, *Critique of the CSES report 'The impact of PBS reforms on PBS expenditure and savings'* (2009)
- Report for Alzheimer's Australia, *Making choices: Future dementia care: projections, problems and preferences* (April 2009)
- Report for National Alcohol Beverage Industry Council, *Collins and Lapsley report review: avoidable costs* (2008)
- Report for Distilled Spirits Industry Council of Australia, *Injury risk and drinking: technical critique* (2008)
- Report for Department of Health (Federal), *Critique of the Evaluation of the Second Round Coordinated Care Trials* (2007)

The examples provided are a short selection of the complete CV, tailored for this purpose.

Appendix 2 - Information relied upon

- ABS 2015, '6291.0.55.003 - Labour force, Australia, detailed, quarterly, Aug 2015', <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202015?OpenDocument>, last accessed 29 October 2015.
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- ABS 2015, '8501.0 - Retail trade, Australia, Aug 2015', <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8501.0Aug%202015?OpenDocument>, last accessed 29 October 2015.
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- Atalay K. and Barrett G. F. 2014, The impact of age pension eligibility on retirement and program dependence: evidence from an Australian experiment. *Review of Economics and Statistics*, 97: 71-87.
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<http://www.degruyter.com/view/j/snnde.1997.2.1/snnde.1997.2.1.1024/snnde.1997.2.1.1024.xml>
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- Wooldridge, J. M. 2013, *Introductory Econometrics A Modern Approach*, South-Western, Cengage Learning, Mason USA.
- Yu S 2015, 'Evaluating the impact of Sunday penalty rates in the NSW retail industry', A report prepared for the Shop, Distributive and Allied employees Association (SDA),
<https://www.fwc.gov.au/documents/sites/awardsmodernfouryr/AM2014305-expert6-SDA-040915.pdf>, last accessed 29 October 2015.
- Yu S 2015, 'AM2014/305 Four yearly review of Modern Awards – Penalty Rates (the Review)', 5 November 2015.

Exhibit A – Letter of instruction from FCB Group



LEVEL 18, 607 BOURKE ST, MELBOURNE VIC 3000
ACN 125 440 342

18 November 2013

Lynne Pezzullo
Deloitte Access Economics
1/9 Sydney Avenue
Barton, ACT 2600

Dear Ms Pezzullo,

Four Yearly Review of Modern Awards – Penalty Rates

We act on behalf of the Australian Retailers Association (ARA), Master Grocers Association (MGA) and National Retail Association (NRA) in relation to the above matter.

You are engaged by FCB to provide your expert opinion in relation to the report titled "AM2014/305 Four yearly review of Modern Awards – Penalty Rates (the Review)" and dated 5 November 2013, being a reply report of Ms Serene Yu of the University of Technology Sydney (Yu Reply Report).

A copy of the Yu Reply Report is attached to this correspondence and marked "Attachment A".

Given your previous reports filed in the above matter we understand it is unnecessary to set out for you the background to the Four Yearly Review.

We ask that you provide a written report containing your opinion of the Yu Reply Report.

If you require further information please do not hesitate to contact me.

Yours Faithfully

A handwritten signature in black ink, appearing to read "NT", written over a light blue horizontal line.

Nick Tindley

PO BOX 58, COLLINS ST WEST VIC 3007
T +61 3 9098 9400 F +61 3 9098 9499 W WWW.FCBGROUP.COM.AU