FINANCIAL MODELLING OF FINANCIAL VIABILITY

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Sydney is where the Australian office of Balmoral Group resides. It is the traditional home of the Gadigal Aboriginal people of the Eora Nation. The authors acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

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1. Approach to the analysis

BGA provided independent analysis to estimate the impact of the proposed new wage assessment structure on the financial risk of Australian Disability Enterprises (ADEs).

While a range of factors (such as market share and concentration, remoteness, and company structure) influence viability, this analysis focuses on the wage/ turnover ratio as a measure of financial risk. The rationale for this is that:

- there is direct relationship between the new wage assessment structure and this measure of risk
- the ratio has a clear interpretation (i.e. the fraction of turnover that is used to pay wages)
- the ratio is stable over the short to medium term
- the data is readily available from ADEs in the sample.

2. Benchmarking method

The benchmarks against which to compare post-Trial wage/ turnover rations are based on FY19 and FY20 payroll/revenue data from financial surveys for ADEs that participated in the wage trial and did report a surplus[1]. The average for the 2 years was calculated to collect the mean payroll (both supported and non-supported employees) as a percentage of revenue. The ADEs were then grouped by industry to compute the industry average ratios. For industries not in the sample, the average wage/turnover ratio of 71% was applied.

To account for intra-industry variations, confidence intervals were computed to give an upper bound benchmark. The upper bound benchmark gives the extent to which an industry can stretch its payroll/turnover ratio. The upper bound is estimated as the sum of the mean plus half the standard deviation from the mean[2]. The highest upper bound industry benchmark for the ADEs in the sample that had a surplus was 86%.

An ADE is considered lower risk if its ratio falls below the upper bound benchmark.

1 A positive two-year average profit/revenue ratio considered as being a surplus.
2 Half of std dev falls below the mean (lower bound), half above the mean (upper bound).

Table 9 below shows the upper bound benchmark by industry group.

Table 1. Indicative benchmarks for sampled ADEs by primary industry

Industry	SE Wage/ Turnover	Total ADE Wage/ Turnover	Upper Bound Benchmark
Administrative and support services	22%	74%	80%
Agriculture, forestry and fishing	17%	54%	77%
Construction	34%	80%	76%
Electricity, gas, water and waste services	18%	55%	66%
Manufacturing	25%	71%	80%
Other services	13%	60%	86%
Average	22%	**71%**	**78%**

Source: BGA work product

An ADE is considered at high financial risk after the introduction of the new wage assessment structure if the wage/turnover ratio is above the average upper bound benchmark (78%). An ADE is considered at highest risk after the introduction of the new wage assessment structure if the wage/turnover ratio greater than the highest upper bound of the industries (86%).

However, ADEs that fall below this may also be at risk given other factors not accounted for.

An external source for setting benchmarks was explored but as ATO benchmarks are set for-profit organisations, it was agreed that these would not provide a suitable comparison.

3. Regression model

Regression analysis was employed to identify and estimate the determinants of the wage change (i.e., the difference between the wages prior to the policy change and the wages after the policy change). Data was cleaned and assembled for regression modelling. Descriptive statistics of the variables tested are included in the Appendix A. A correlation matrix of all variables was generated and no strong correlations were found that would interfere with intended modelling. In accordance with established literature, both Log and Ordinary Least Squares models (OLS) were tested for functional form. Multiple iterations were conducted to improve fit and identify critical variables of interest.

Dependent Variable

The dependent variable is wage change and is computed as:

$$Payroll\ change = \frac{(New\ weekly\ wages\ with\ super - current\ weekly\ wages\ with\ super)}{Hours\ worked\ per\ week}$$

Initial models tested dependent variables for the dollar change in hourly wages and weekly wages, with and without superannuation, in linear and log form. The log form

equation had very poor explanatory value; one hypothesis is that the floor on both minimum wage and super does not fit well with the log form.

Model Specification

The model specification is as follows:

$$(1)\ DIFFHR_{ij} = \beta_0 + \beta_1 ADE\ Location_j + \beta_2 ADE\ Size_j + \beta_3\ ADE\ Tool_j + \beta_4\ Productivity_i + \beta_5 Wage\ Class_j + \beta_6 SUPERDIF_i + \varepsilon_{ij}$$

where i indexes a supported employee and j indexes an ADE. As such, $DIFFHR_{ij}$ is the difference with superannuation between new hourly wage and current hourly wage; $ADE\ Location_j$ represents a set of three dummy variables, each of which assume value one for ADEs in a Metropolitan, Regional, or Remote location; $ADE\ Size_j$ represents a set of three dummy variables, each of which assumes value one for ADEs of a Small, Medium, and Large size using the ABS definition; $ADE\ Tool_j$ represents a set of dummy variables each of which assumes value one if a given ADE is using the Greenacres, Skillsmaster, FWS, Wage Tool 1, SWS, or Wage Tool 2 wage tool; $Productivity_i$ denotes the productivity rating of a supported employee; $Wage\ Class_j$ denotes a set of dummy variables, each of which assume value one for a supported employee using Grade A, Grade B, or Grade 1-4 wage grade; $SUPERDIF_i$ represents the net new superannuation value applied; and ε_{ij} denotes the regression error (i.e., everything that determines the wage change not included in Equation 1).

The dollar change in wages was used as the dependent variable including the hourly effect of superannuation costs under the new structure; the mean was $3.84. The superannuation calculation used the 50/50 assessment with floor and the minimum $15.00 weekly super, which was divided by the employee's average working hours (which averaged 22.1, but ranged from 3.5 to 38). The net change in super was held constant through a super variable.

Model Iteration

While ADE State (NSW, VIC, etc.) was included in the original dataset, the variable was dropped due to perfect collinearity with location category (Metropolitan, Regional and Remote).

The base case in our regression included Metropolitan location, large ADE, Grade 1 wage class and current SWS tool usage. Five other tools were included in the sample set, with usage ranging from 2% to 52% of the sample; all were significant with p-values of 0.0000.

Modelling results were tested for sensitivity to variations; ultimately it was determined that industry category, although very significant for some industries, was not significant for all. Further, it would not be feasible to use the results in the extrapolation to the sector because of the insufficient quality of industry data.

The effect of superannuation was isolated and included in hourly form and was highly significant.

Model Results

All coefficients had expected signs and most had expected significance. Selected model coefficients and parameters are provided in **Table 10**; results showed explanatory value of 0.81 adjusted R^2 and the lowest Akaike Criterion of the models run, at 4.04.

Table 2. Selected model parameters

Variable of Interest	Coefficient	Interpretation of Results	Average value across sample
ADE Size – Small	-1.38***	Small ADEs see a $1.38 net smaller hourly wage effect than large ADEs.	9.8%
ADE Size – Medium	-0.48***	The net hourly wage effect has a $0.48 smaller effect for Medium ADEs when compared to large ADEs.	55%
Two other Assessment Tools	2.26 to 2.95***	For five non-SWS tools in effect, the hourly wage effect ranges from $1.15 to $3.87; considering the weighted average the net effect is $1.69.	2% to 52%
Greenacre	1.65***		
Skillsmaster	1.15***		
FWS	3.87***		
ADE location – Regional	-0.05***	Estimated hourly effect on Regional ADEs is $0.05 lower than Metro-located ADEs.	52%
Productivity	0.06***	A one percentage point increase in an individual's productivity rating is associated with an increase in their hourly wage of $0.06.	61%
Grade A	-3.08***	Wage Grade A is strongly significant and at the mean shows a reduction of about $1.08 in net hourly wages. Grade B shows a reduction of about $0.38 in net hourly wages and is 28% of the	2% to 35%
Grade B	-1.32***		
Grade 2	1.11***		
Grade 3	1.22***		

Grade 4	0.85***	sample. Grade 3 and Grade 4 are significant; however, due to a minor portion of SEs classified at Grade 3 and 4, the new wage system shows no impact on higher graded jobs.	
Super	4.61***	Net hourly effect of super is held constant to isolate influence of other variables on net wage. At the weighted average, the super effect on wage outcome is $2.66	2.66
*****, **, * Significant at 1%, 5%, 10% level.**			

Source: BGA work product

4. Estimating the impact

The number of supported employees, size and location data was available for all 161 ADEs, but not detailed financial data or data on supported employee working hours, so assumptions had to be made.

ADE-level data for the sample was clustered around the possible combinations of size and location. Ultimately, mean revenues were assigned to ADEs by size and location, excluding one outlier firm with revenues more than twice the next largest firm. **Table 12** summarizes the groups.

Table 3. ADE Average Turnover by Size and location

	Remote	Regional	Metropolitan
Small	Not reported*	$730,542	$4,356,296
Medium	Not reported*	$4,988,289	$5,890,624
Large	NA	NA	$17,393,469

Source: BGA work product, from survey data.

* Not reported as there are too small a number of remote ADEs

Model components

- The model to estimate the impact of the new wage assessment structure uses the sum of the constant and the coefficients from the regression model (size, location, current wage tool[3], wage grade and productivity, and net super) to estimate the hourly change in wage at ADE level. This results in the wage

[3] For out of sample ADEs using wage tools that are used only by one organisation, a weighted average is used. Where the population data does not specify what tool an ADE is using, they are assumed to be using an ''other" wage tool (i.e other than SWS, FWS, Greenacres and Skillsmaster).

increase for a particular ADE either being increased or decreased for the ADE based on relevant factors.[4]
    - For ADEs in the Trial, the actual average productivity rating across supported employees is used. For those outside of the sample, the average productivity rating for employees in ADEs of that size and location is used.
    - For all ADEs (those in the sample and the population), the distribution of supported employees by wage grade is used.
- The average hourly wage increase is multiplied by the average supported employee working hours reported in ADEs of the same size and location, and then multiplied by the number of weeks in the year to calculate an average annual wage increase.
- The average annual wage increase is multiplied the number of supported employees in the ADE to estimate an annual wage increase for the ADE.
- To estimate the resulting wage turnover ratio:
    - For ADEs in the Trial, their estimated wage increase/ turnover is added to their actual wage/ turnover.[5]
    - For ADEs outside of the sample, their estimated wage increase/ estimated[6] turnover is added to the average wage/ turnover for ADEs in the sample (71%).

Limitations

The financial modelling is limited by the following factors:

- **The sample of ADEs** may differ from the general population of ADEs and supported employees. Although steps were taken to ensure that the sample was broadly representative of the general population of ADEs, recruitment for the study may have resulted in a non-representative sample – as not all sample ADEs agreed to participate and there were five fewer ADEs in the sample than planned. Moreover, there are 41 organisations in the ADE population that either use their own wage tool or it is unclear which wage tool they use and it is difficult to predict what wage differences for these organisations will be.
- **The quality of the Trial assessment data** there were some issues with consistency of implementation of the new wage assessment structure (explained in chapter 5).

[4] Where the combination of factors estimated a reduction, the value was set to $0 because no supported employees' wages will reduce under the new structure.
[5] Where turnover is held constant.
[6] Where, among ADEs outside of the sample, turnover is assumed to be equal to the average turnover for ADEs of the same size and location in the sample. Note that we exclude one outlier from these calculations.

- **The limitations of the financial data provided by ADEs**:
  - While unexpected data was followed up and corrected there remain some concerns about the quality of data provided.
  - The model uses 2018-19 and 2019-20 financial data as 2020-21 financial data would not have been available at the time of collection. As such, although the impact of COVID19 is factored into the 2019-20 financial data, but COVID19 would have had further impact in 2021-22.
  - Recent changes to NDIS pricing for supported employment will also be impacting ADE financials (anecdotally this may be positively or negatively). Examination of these changes is outside the scope of this project.

- **Limitations to regression modelling.** Data constraints prevented BGA from including all factors that may be relevant to predicting changes to an individual's wage in their regression model. As such, the estimates produced by the regression model and used in the financial modelling should be interpreted with caution.
- **Limited information about ADEs outside of the sample**
  - Financial data is only available for ADEs in the Trial. The financial position of ADEs outside the Trial had to be assumed based on data for ADEs of a similar size and location to those in the Trial.
  - Industry was going to be used to estimate wage turnover ratios because these are expected to differ by industry but industry data on the ADE population was too limited to do this. The majority of ADEs operate across multiple industries and it was unclear which was their primary industry.
  - There is not data on employee characteristics for ADEs, which might influence wage outcomes.
  - Additionally, distribution of employees by wage grade at each ADE had to be assumed using Trial data (and there were concerns about accuracy of this), while the distribution of employees by wage grade would likely differ by ADE.
  - The population of ADEs operating under the Award had to be assumed as a list of organisations using the Award is not maintained – so the analysis may be over-estimating the number of ADEs and supported employees impacted.

- **Lack of a relevant external benchmark.** There is not a suitable external reference for wage/ turnover ratios that reflects the not-for-profit model of ADEs, against which to assess financial risk.
- **Factors not considered in the model.**

- Wage turnover/ ratio is only one indicator of risk. Exploring other indicators was outside the scope of the Trial.
- It is not possible to make accurate assumptions about the actions or combination of actions ADEs may take, including closing, cross-subsidising, reducing employee numbers.
- Actions supported employees might take due to their wages reaching a level at which their DSP would be affected was not factored into model because it is not possible to make accurate assumptions about supported employee actions.

Estimation for ADEs in the Trial

The analysis estimated that the new wage structure would result in an average wage increase of $1.2 million annually per ADE in the sample. This effect varied substantially from $6,288 to $11.4 million; two ADEs with large numbers of supported employees were outliers. The total size of the wage increases across the 28 ADEs employing 6335 supported employees (approximately one third of the supported employee population) was estimated to be about $35.7 million per year. This should be interpreted with caution given the assumptions that had to be made in the modelling and the potential influence of other factors on wage outcomes.

When compared to the benchmarks, the modelling suggests 10 ADEs would be classed as highest risk (i.e., have a wage/ turnover ratio exceeding 86%) and three ADEs would be classed as high risk (i.e., have a wage/ turnover ratio exceeding 78%).

Estimation for the population

The analysis estimated wage increases for the sector of $76.1 million annually. As, 41 ADEs are using other tools not in the sample or an unspecified tool, a sensitivity test was carried out on the impact of the difference on the value of "other" tools – using two standard deviations plus/ minus the value for other wage tools to identify a lower and upper estimate.

TABLE 1. SENSITIVITY ANALYSIS- WAGE CHANGE AND RISK ASSESSMENT AT VARYING OTHER WAGE TOOLS

Options	Lower estimate $1.10	Central $ 1.69	Upper estimate $2.27
Total estimated wage increase	$ 74,587,062	$ 76,063,676	$ 77,540,291
Number of ADEs at high risk	20	25	24
Number of ADEs at highest risk	10	10	11
Number of supported employees in high risk ADEs	3,775	4,203	3,761
Number of supported employees in highest risk ADEs	2,839	2,839	3,281

These results should be interpreted with caution because of the range of assumptions that had to be made. Financial data had to be estimated for ADEs not in the Trial, but other ADE's financials may differ. Wage differences may differ for those using wage tools that were not included in the sample. The Trial results for wage grades and productivity rates, but there are some concerns about the accuracy of wage grading in the Trial, and the pattern of employees by wage grade may differ between organisations. Where ADEs outside of the sample differ from those in the sample on key factors in the model, this would influence the results. Other factors not in the model could also influence the results. It should also be noted that ADEs have already begun to absorb the additional costs of superannuation that are included in this model as the changes to superannuation have already come into effect.

Appendix A

Our empirical model is as follows:

(1) $$DIFFHR = \beta_0 + \beta_1(REGION)_i + \beta_2(SMALL)_i + \beta_3(MEDIUM)_i + \beta_4(GREEN)_i + \beta_5(SKILLS)_i + \beta_6(FWS)_i + \beta_7(Tool\ 1)_i + \beta_8(Tool\ 2)_i + \beta_9(PRODUCTIVITY)_i + \beta_{10}(CLASSA)_i + \beta_{11}(CLASSB)_i + \beta_{12}(CLASSC)_i + \beta_{13}(CLASSD)_i + \beta_{14}(CLASSE)_i + \beta_{15}(SUPERDIF)_i + \varepsilon_i$$

where i indexes the supported employees and where, DIFFHR = difference with superannuation between new hourly wage and current hourly wage.

1. Descriptive Statistics

Table 4. Descriptive Statistics, Final Dataset

Variable	Mean	Standard Deviation	Minimum	Maximum	Cases
AGE 55-64	0.14	0.35	0.00	1.00	379
AGE 35-44	0.20	0.40	0.00	1.00	379
AGE 45-54	0.23	0.42	0.00	1.00	379
AGE 25-34	0.28	0.45	0.00	1.00	379
AGE 18-24	0.10	0.30	0.00	1.00	379
AGE 65-74	0.05	0.21	0.00	1.00	379
FEMALE	0.34	0.47	0.00	1.00	379
MALE	0.66	0.47	0.00	1.00	379
METRO	0.46	0.50	0.00	1.00	379
REGIO	0.52	0.50	0.00	1.00	379
REMOTE	0.01	0.11	0.00	1.00	379
SMALL	0.10	0.30	0.00	1.00	379
MEDIUM	0.55	0.50	0.00	1.00	379
LARGE	0.35	0.48	0.00	1.00	379
Greenacres	0.52	0.50	0.00	1.00	379
Skillsmaster	0.14	0.35	0.00	1.00	379
FWS	0.12	0.32	0.00	1.00	379
Wage Tool 1	0.07	0.25	0.00	1.00	379
SWS	0.13	0.34	0.00	1.00	379
Wage Tool 2	0.02	0.14	0.00	1.00	379
Other Services	0.31	0.46	0.00	1.00	379
Manufacturing	0.52	0.50	0.00	1.00	379
Transport, Postal and Warehousing	0.06	0.24	0.00	1.00	379
Agriculture, Forestry and Fishing	0.03	0.17	0.00	1.00	379
Administrative and Support Services	0.04	0.21	0.00	1.00	379
Retail Trade	0.02	0.12	0.00	1.00	379
Electricity, Gas, Water and Waste Services	0.01	0.09	0.00	1.00	379

Accommodation and Food Services	0.02	0.12	0.00	1.00	379
WAGE_CHA	0.63	0.80	0.00	8.30	379
CURRENT_	6.51	3.58	0.00	19.83	379
WAGE_OUTCOME	9.77	5.26	1.60	22.06	379
ACTCHNG	3.26	3.83	3.59	18.67	379
PRODUCTIVITY	60.87	22.38	0.00	100.00	379
CLASSA	0.35	0.48	0.08	1.00	379
CLASSB	0.28	0.45	0.00	1.00	379
CLASSC	0.27	0.45	0.00	1.00	379
CLASSD	0.05	0.21	0.00	1.00	379
CLASSE	0.02	0.14	0.00	1.00	379
CLASSF	0.02	0.15	0.00	1.00	379
VIC	0.23	0.42	0.00	1.00	379
WA	0.07	0.25	0.00	1.00	379
SA	0.18	0.39	0.00	1.00	379
NSW	0.28	0.45	0.00	1.00	379
QLD	0.22	0.41	0.00	1.00	379
TAS	0.03	0.16	0.00	1.00	379
PRCHNG	0.70	0.80	0.00	8.34	379
PRDIFF	88.81	111.97	9.35	479.12	379
DIFFHR	3.87	4.10	12.57	20.55	379
SUPERDIF	0.58	0.42	0.02	2.57	379

2. Regression Results

Ordinary least squares regression Weighting variable = none

REGRESS;Lhs=DIFFHR; Rhs=ONE,REGIO,SMALL,MEDIUM,GREEN,SKILLS,FWS,Wage tool 1, Wage tool 2,PRODUCTI,CLASSA,CLASSB,CLASSC,CLASSD,CLASSE,SUPERDIF$

Dep. var. = DIFFHR Mean= 3.841782446, S.D.= 4.097967597

Model size: Observations = 379, Parameters = 16, Deg.Fr.= 363

Residuals: Sum of squares= 1156.115072, Std.Dev.= 1.78463

Fit: R-squared= .817874, Adjusted R-squared = .81035

Model test: F[15, 363] = 108.67, Prob value = .00000

Diagnostic: Log-L = -749.1241, Restricted(b=0) Log-L = -1071.8532

LogAmemiyaPrCrt.= 1.200, Akaike Info. Crt.= 4.038

Autocorrel: Durbin-Watson Statistic = 1.61797, Rho = .19101

Variable	Coefficient	Standard Error of the estimate	P(|T|>t)

Constant	(3.08)	0.70	-
REGIO	(0.05)	0.25	0.85
SMALL	(1.38)	0.40	0.00
MEDIUM	(0.48)	0.25	0.06
TOOL1	1.65	0.39	-
TOOL2	1.15	0.45	-
TOOL3	3.87	0.43	-
TOOL4	2.26	0.54	-
TOOL5	2.95	0.88	0.00
PRODUCTI	0.067	0.46	-
CLASSA	(3.08)	0.68	-
CLASSB	(1.32)	0.69	0.06
CLASSC	1.11	0.65	0.09
CLASSD	1.22	0.78	0.12
CLASSE	0.85	0.96	0.38
SUPERDIF	4.61	0.26	-

* Class A, B, C, D, E, F variables are Grade A, B, 2, 3, 4, and 1 respectively.