Wage costs

Review outcomes

- The following changes were made to the assessment.
 - The dependent variable in the regression model has changed from weekly to hourly wages. This appropriately reflects that workers who work longer hours receive higher weekly wages.
 - The model has been simplified, with the following changes:
 - 11 distinct 5-year age categories have replaced a derived measure of experience
 - o variables for usual working part-time, or more than full time, were simplified
 - Over 200 detailed industry variables were replaced by 19 industry divisions
 - o gender interaction variables, that reflect that women and men have different labour market experiences, were removed.
 - A weighted average of several years of data has been used to increase effective sample size and reduce volatility in the wage cost estimates.
 - The way state expenses are designated as wage-related or not wage-related has been revised so as not to overestimate wage-related costs.
- The Commission considered but did not change the following.
 - Differences in private sector wages are used as a policy neutral proxy for the market pressures faced by public sector employers.
 - The ABS Characteristics of Employment survey data is used for the assessment, because of its sample size, reliability and availability of control variables
 - The full sample of private sector employees survey data is used, as data are not sufficient to select a sub-set that more closely resembles the public sector.
 - A 12.5% discount is applied to reflect some uncertainty in the strength of the proxy and the underlying data.
- The Commission will validate the regression results from each annual Characteristics of Employment survey before including them in its measure of wage costs. The Commission will continue to investigate alternative data sources both for validation and as potential alternatives to the Characteristics of Employment surveys.

Introduction

- On 6 July 2024, the Commission published the <u>Draft Report</u> for the 2025 Methodology Review.
- The Draft Report included a detailed analysis and response to issues raised by states and territories (states) in their <u>submissions</u> on the Commission's <u>consultation paper</u>, and the <u>addendum</u>, following a <u>review</u> by an external consultant.
- 3 State submissions on the Draft Report can be viewed <u>here</u>.
- 4 This chapter includes:
 - an overview of the issues considered throughout the review
 - the Commission's response and decision on each issue
 - · GST impacts of method changes.
- A description of the assessment method, incorporating changes made in the 2025 Review, can be found in the wage costs chapter of the *Commission's Assessment Methodology*.

Issues considered

Use of the private sector proxy

The Commission aims to measure the underlying wage pressures faced by states to employ similar staff in a way that is not influenced by state policy. As public sector wages are influenced by state policy, direct measurement of public sector wage differentials is not appropriate. The Commission measures private sector wage differentials across states as a proxy for underlying wage pressures that are shared by the public sector.

State views

National markets

Some states said they compete primarily in a national market and do not refer to private sector wages when negotiating wage rises with employees. These states argued that private sector wage levels are not a good proxy for public sector wage levels, as there is no direct competition for labour between private and public employers locally.

Controlling for differences in private sector labour markets

- 8 Some states argued that incomplete controls mean that states can be recognised to have higher wages for similar individuals due to having a prevalence of high-income industries.
- 9 Some states argued that there are differences between state private sector labour markets that are not controlled for in the model. These include differences such as

the size of workplaces, health factors, regionality, non-wage benefits and different responsibilities for workers with the same occupations and qualifications.

Sector specific drivers

Some states said that there are fundamental differences between private and public sector labour markets. The private sector workforce is male dominated, while the public sector workforce is female dominated. Some industries are overrepresented in the public sector, while other industries are virtually non-existent in the public sector.

Commission response

National markets

- 11 States compete for labour in both the local private sector market and national and international markets. Where national labour markets exist, the validity of the proxy measure only requires that some factors beyond a state's control (such as cost of living) affect worker relocation decisions and wage negotiations in a similar manner in both the public and private sectors. When workers choose to move between jurisdictions, they consider these factors in addition to wages. There is no evidence that factors like cost of living or climate are weighted differently by workers in a particular sector or industry.
- Any drivers of differences in wages between states (beyond causes that are controlled for in the model) will be reflected in the state regression coefficients. The Commission considers that such drivers are likely to reflect general local labour market conditions.

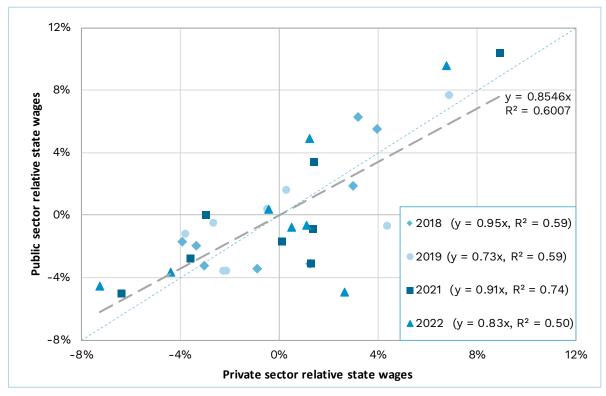
Controlling for differences in private sector labour markets

- 13 Measured wage differentials should not reflect differences in industry mix as this is controlled for in the model.
- Analysis of a similar model using Household Income and Labour Dynamics in Australia and Person Level Integrated Data Asset data showed that including additional variables not available in the ABS Characteristics of Employment Survey did not systematically and consistently change any state coefficients.
- Regional and remote effects are accounted for separately in the Commission's assessments, for that reason it is unnecessary to include the effects of remoteness on relative state wages. Remoteness variables have therefore not been included in the model.

Sector specific drivers

While there are significant differences between the public and private sector labour markets, these do not necessarily mean that they respond differently to local factors. There is a strong correlation between the measured relative wage levels in the public and private sectors, see Figure 1.

Figure 1 Relative state wage levels, public vs private



Notes: Four years of data from the Characteristics of Employment surveys are included.

Each point represents a single state in a single year.

The slope and strength of the relationship between public and private sector state wage levels are shown for each year within the legend, and across all 4 years with a line of best fit on the chart.

- The Commission recognises differences in the differential between wages in states' public and private sectors. This may be due to differences in the responsiveness of the public and private sectors, labour markets of different industries varying, and state wage setting policies. There is also imperfect measurement in both sectors. These issues do not preclude the proxy being an unbiased estimate of state-specific pressure on public sector wages.
- 18 While noting that public and private labour markets are distinct, Professor Preston (who was engaged by the Commission in 2023 as a consultant to review the wages assessment) recommended the continued use of relative private sector wages as a policy neutral proxy for public sector wage costs.¹

Commission decision

19 The Commission will continue to use relative private sector wage levels as a proxy for relative public sector wage costs.

¹ A. Preston, Wage Costs Consultant Report, report to the Australian Government, Commonwealth Grants Commission, 2023.

Choice of survey data source

- The Commission proposed to continue to use the ABS Characteristics of Employment survey for the wage costs assessment because of its superiority in terms of sample size (relative to the Household Income and Labour Dynamics in Australia survey), reliability, and availability of control variables.
- 21 Several states encouraged investigation of other data sources for the purposes of validating the results, or to support potential alternative assessment methods.

State views

- Several states expressed an interest in investigating other data sources as a potential alternative method or for validating results. Victoria suggested using the Household, Income and Labour Dynamics in Australia Survey. Victoria and Queensland suggested using the Person Level Integrated Data Asset.²
- Western Australia expressed concerns that a household survey, such as the Characteristics of Employment Survey, is significantly affected by measurement error. It said this may be alleviated by an employer survey such as Average Weekly Earnings. It said that the reduced range of variables included in this survey would be more than offset by the increased quality of labour cost data. The ACT suggested considering the Monthly Employee Earnings and Weekly Payroll Jobs or the Linked Employer-Employee Database.
- Tasmania expressed concern over the Tasmanian sample size in the Characteristics of Employment survey resulting in high standard errors. It also noted that variables on workplace size and employee health are not available in the Characteristics of Employment Survey and considered their absence may bias state coefficients.
- Most states supported the continued use of the Characteristics of Employment survey, given the shortcomings of the suggested alternatives.

Commission response

- 26 For use in the wages assessment, a dataset should:
 - have a large sample size in all states to estimate all state coefficients with a reasonable level of reliability
 - have sufficient information about factors that determine differences in wages between individuals
 - reliably measure the data it purports to capture.

² Formerly known as the Multi-Agency Data Integration Project.

- 27 Each of the proposed datasets has relative strengths and weaknesses in these domains. The Commission aimed to identify the data source with the best overall combination of the above attributes. Its analysis found the following.
 - The Household, Income and Labour Dynamics in Australia survey allows for the control of endogeneity through a range of employee information, however it has an extremely small sample size. For example, it follows largely the same sample of fewer than 50 private sector employees in the Northern Territory every year. By comparison, the Characteristics of Employment Survey creates independent samples of over 500 private sector employees in the Northern Territory each year.
 - The Person Level Integrated Data Asset (or other linked administrative datasets) has a much larger sample than survey-based data, however the comprehensiveness of the data is lower. It would be necessary to relate total income earned in a financial year (as reported to the Australian Taxation Office) to the occupation, hours and other attributes described for one week in August in the census. This weak link between the outcome of interest (annual income) and the predictors (employment status and occupation at a point in time) reduces the reliability of the model. This issue was accentuated with the 2021 Census which was undertaken while many workplaces were affected by COVID-19 emergency measures.
 - Employer-based collections (such as Average Weekly Earnings, Single Touch Payroll data, or the Linked Employer-Employee Dataset) may provide a more precise estimate of labour costs. However, they only allow limited controls such as industry and hours. This means they cannot be used to adjust for key differences in state labour markets, such as level of education and mix of occupations.
- The Commission built models using the Person Level Integrated Data Asset and the Household, Income and Labour Dynamics in Australia survey data. These models showed the same basic pattern of wage costs between states as found with the Characteristics of Employment survey.
- 29 The Commission considers that using an employer survey for the wages cost assessment would create omitted variable bias. Differences within industries between states due to workforce characteristics cannot be controlled for using employer survey data.
- Analysis of Tasmania's concerns with potential bias due to omission of workplace size and employee health controls was conducted using the Household, Income and Labour Dynamics in Australia survey data and the Person Level Integrated Data Asset. The inclusion of health controls does not affect state coefficients. The effects of including controls for workplace size are inconsistent between datasets and inconclusive, although this issue warrants further investigation.

Commission decision

31 The Commission will continue to use the ABS Characteristics of Employment survey as the data source to measure differences in wage costs between states.

The balance of evidence does not provide a compelling case that there is bias in the model due to the omission of workplace size as an explanatory variable. However, the possibility of such bias cannot be ruled out, and the Commission will continue to investigate this issue after the 2025 Review as further data become available.

Use of the full sample of private sector employees

33 Some states suggested restricting the sample of private sector employees used in the regression to improve comparability with the public sector on the basis of gender or industry.

State views

- 34 Most states supported the use of the full sample of private sector employees.

 South Australia said that female private sector workers are more representative of pressures on public sector salaries than male private sector workers. It suggested using a weighted average of female and male estimates, combined in proportion to their share of the public sector.
- Tasmania and South Australia also recommended the Commission consider removing industries where public sector employment was low, such as mining.

Commission response

- The Commission saw merit in the idea that the accuracy of the model might be improved by either selecting a sub-sample of private sector workers more closely resembling the public sector workforce, or by reweighting the sample to better reflect the public sector profile. However, the Characteristics of Employment survey does not have a sufficiently large sample to support these options. The Commission considered the reduction in sample size from a female only model would outweigh any potential gains in accuracy, particularly given the objective to mitigate volatility in the assessment.
- 37 The Commission tested models reweighted by gender, and by industry, to better reflect the gender or industry makeup of the public sector. Both of these models had similar reductions in explanatory power and precision of estimates, without improving correlation to public sector relative wage levels.
- The Commission does not consider that the added complexity of creating custom weights in the survey data is justified. Reducing the sample by omitting individuals based on their industry, occupation or gender is likewise hard to justify and greatly reduces the reliability of estimates.

Commission decision

39 The Commission will continue to use all the private sector employees survey data and will not exclude groups or apply custom weights in an effort to improve comparability with the public sector.

Choice of dependent variable

- The model uses a range of variables to predict the logarithm of wages. In the 2020 Review, the Commission determined the dependent variable in its regression model would be the logarithm of weekly wages.
- In the 2025 Review, the Commission proposed the use of hourly wages as the dependent variable to reflect that not all workers in the sample are paid fixed salaries. Weekly wages vary with hours of work, while hourly wages are more stable and comparable.
- In the 2020 survey data, the Commission removed individuals who earned exactly \$750 in the survey week, as these individuals were likely to have been receiving JobKeeper payments, leading to biased results. When using hourly wages as the dependent variable, those individuals who earned their full salary while working reduced hours in the survey period would also bias the model. The Commission therefore proposed to remove the 2020 survey data and not have it contribute to Commission estimates of relative state wages as it was an outlier which biased the results.

State views

- 43 Most states supported the use of hourly wages rather than weekly wages. Following advice from a report it commissioned, Queensland preferred weekly wages, saying the following.³
 - The use of hourly wages is better suited to samples in which workers vary their hours of work, while weekly wages are more appropriate where workers' hours are comparable. The rationale of the assessment is to measure differences in the earnings of comparable private sector workers, which is better aligned with the 2020 Review approach (estimating weekly wages).
 - Hourly wages may lead to spurious correlation, especially if measures of hours or other variables correlated with hours of work are included as regressors.
 - A switch to hourly wage from weekly wage decreases the explanatory power of the model.
- Queensland argued that most public sector workers are employed on a salary basis, rather than an hourly rate. It considered that this means any competition for state employees is based on weekly pay rather than an hourly wage.
- No state disputed the necessity of removing the 2020 survey data, affected by JobKeeper payments, to avoid it biasing the Commission's estimates.

³ C. Rose, L. Yu and A. Rambaldi, 'Modelling Public Wages Expenses Across States and Time Using Survey data', University of Queensland, 2023.

Commission response

- The weekly hours worked in the Australian labour market vary considerably. In 2023, 29% of public and 31% of private sector workers usually worked less than 35 hours a week, while 12% of public and 16% of private sector workers usually worked more than 40 hours a week. Such differences mean an hourly wage-based model is preferred. Similar models in the academic literature generally use hourly wages unless no information on hours worked is available. In such cases, those models are usually restricted to full-time workers, to ensure workers are comparable along the lines of hours of work.
- 47 Queensland workers, on average, have a longer working week than the Australian average, increasing their weekly wage. In the 2020 Review approach, part of this weekly wage was attributed to working in Queensland. Changing to hourly wages appropriately reflects that workers who work longer hours receive higher weekly wages.
- The lower R² associated with an hourly wage model than a weekly wage model reflects that there is greater variation in weekly than hourly wages, and much of this variation in weekly wages is directly related to variation in hours worked. Hourly and weekly wage models can be functionally equivalent and have the same level of unexplained variation.

Commission decision

The Commission will use hourly wages rather than weekly wages as the dependent variable and will not use the COVID-19 biased estimates from 2020 when constructing relative state wage costs.

Simplification of the model

- Most states argued that the regression model was overly complex and included too many controls. The consultant engaged by the Commission, Professor Preston, agreed and made suggestions for control selection.
- In its investigation into the appropriate functional form for the model, the Commission applied the following criteria for inclusion of a control variable in the model.
 - There should be a strong conceptual case that it more appropriately affects an individual's wages.
 - It should materially affect state coefficients on average.
 - It should improve the overall fit of the model.
 - It should not increase the average standard error of state coefficients.

⁴ A. Preston, Wage Costs Consultant Report, Commonwealth Grants Commission, 2023.

- 52 Following these criteria, these groups of changes were made:
 - 11 distinct 5-year age categories replaced a derived measure of experience
 - variables for usual working part-time, or more than full time were simplified
 - over 200 detailed industry variables were replaced by 19 broad industry divisions
 - gender interaction variables that reflect that women and men have different labour market experiences were removed, halving the total number of controls in the model.

State views

- Most states agreed with the Commission's proposed approach. South Australia said that the criteria for inclusion of a control variable should be weighed against each other as a trade-off, rather than a list of requirements that must all be satisfied. New South Wales said that a variable must change state coefficients and have a strong conceptual basis. It disagreed that it must improve overall fit and decrease standard errors of state coefficients.
- While agreeing with the criteria for inclusion of a variable, some states queried the treatment of specific variables. Queensland was concerned with the inclusion of usual hours indicators, while New South Wales and Victoria queried the changes to the level of detail in the industry and occupation variables.

Commission response

The Commission's criteria for control variables are applied as guiding criteria, rather than requirements. The Commission does not formally weight the relative importance of these criteria. However, the criteria to change state coefficients and have a strong conceptual basis are more important in model selection than improving overall fit and decreasing standard errors.

Usual hours worked variables

- There are conceptual reasons for including a usual hours worked control. For example, an individual who usually works fewer hours is likely to accrue lower job-specific human capital with the same level of tenure, and therefore may have lower hourly earnings. Conversely, an individual who regularly works overtime is likely to experience more rapid human capital accumulation.
- Part-time and long-hours effects have been identified in the literature.⁵ These effects display a similar pattern to coefficient estimates from the model, where part-time workers earn a lower hourly wage and long-hours workers earn a higher wage. The coefficients for these variables differ significantly, indicating that these workers have significantly different wage levels, after controlling for all other differences.

⁵ A. Bick, A. Blandin and R Rogerson, 'Hours and Wages', *The Quarterly Journal of Economics*, 2022, 137(3):1901-1962.

Industry and occupation specification

- The Commission found that the inclusion of controls for detailed categories of industry as opposed to broad categories was not warranted. It increased standard errors for all states, and led to worse fit as measured by statistics which penalise overfitting. Changes to state coefficients were significant but inconsistent across years.
- 59 While there is a conceptual case for including detailed industry categories as controls, it does not consistently affect state coefficients and increases the uncertainty of the model.
- Detailed occupation has a strong conceptual case for inclusion. It affects state coefficients, reduces average standard errors for all states and improves model fit based on all the statistics considered. As such, it was kept in its full detail. Detailed industry did not meet these criteria, and since industry and occupation are separate variables, they do not need to be included at the same level of detail.

Commission decision

As part of simplifying the regression model to measure relative state wage levels, the Commission applied guiding criteria for determining the inclusion of control variables in the model.

Reducing volatility in the assessment

- The assessment has displayed significant volatility, yet wages are not characteristically volatile. The volatility of the assessment is instead related in large part to sampling variation between years of data.
- To reduce this volatility, the Commission considered 2 methods of smoothing the estimates.
 - A pooled approach where 3 years of the sample are combined in the regression and the sample would be centred on the assessment year.
 - A weighted average approach that uses all the available historic data. Annual survey estimates would be indexed to current wage levels using the ABS Wage Price Index. These estimates would be averaged using weights according to their reliability for estimating wages in the assessment year of interest.
- The Commission proposed to use the weighted average approach, on the basis that it allows for more data to be included in the assessment and it is robust to breaks in series.

State views

All states agreed with the proposal to implement some method to reduce volatility and improve the reliability of annual estimates, however, states were divided on which approach was superior. Most states supported the weighted average approach

- due to the greater reduction in volatility of the estimates compared with the pooled approach.
- New South Wales, Queensland and Western Australia opposed the weighted average approach on the grounds that it is overly complex. New South Wales and Tasmania were concerned that the weighted average approach was less contemporaneous. Queensland said that when using the same number of years of data, pooling generates more stable estimates than the weighted average approach.

Commission response

Table 3 shows that the weighted average approach reduces volatility more than using a 3-year pooled sample. It does this by using a sample that covers a longer time period than in the 3-year pooled sample, including all the historic estimates from 2016–17.

Table 1 State GST effects from annual updates to wage costs assessment

	Averag	ge absolute	change	Largest change				
	U2021 to U2022	U2022 to U2023	U2023 to U2024	U2021 to U2022	U2022 to U2023	U2023 to U2024		
	\$pc	\$pc	\$pc	\$pc	\$pc	\$pc		
R2020 methods	46	37	57	112	109	184		
Pooled model	34	30	39	129	70	68		
Weighted averages	21	9	13	105	24	23		

Note: All measures included in the table use the R2020 regression model

- Regarding the view that the proposed method compromises contemporaneity, the Commission recognises that estimates become less influenced by newer years of data. However, insofar as wage movements are reflected in the ABS's Wage Price Index, all indexed estimates for a single year are reflective of the relative wage levels for that year.
- Using additional years increases the statistical power and indexation ensures the data are contemporaneous. The Commission considers that pooling more than 3 years of data is not a viable option, as it is not possible to include more than 3 years in a pooled approach and remain centred on the assessment year. While Queensland pointed out that 3-year pooling may be more reliable than 3-year averaging, the averaging approach allows for a longer time series.

Commission decision

70 The Commission will smooth data over time using a weighted average approach, incorporating data from 2016–17 onwards.

Discounting assessed relative wage costs

71 The Commission has applied a 12.5% discount in the wage costs assessment reflecting uncertainty around the reliability of the survey-based coefficient estimates, the precision of the model and the strength of the correlation between private and public sector wages.

State views

- State views on the appropriate level of discounting were mixed. Victoria said that a 12.5% discount remains appropriate. Some states said no discount is required. Others said a 25% discount is appropriate.
- 73 Some states argued to remove the discount on the grounds that:
 - the Characteristics of Employment Survey and the Commission's model are reliable
 - the relationship between public and private sector wage levels is conceptually and statistically strong
 - the approach is supported by independent consultants
 - the Commission has improved its methods
 - the approach already under-estimates wage differences.
- 74 Other states argued to increase the discount on the grounds that:
 - the Characteristics of Employment Survey and the Commission's model are unreliable
 - the relationship between public and private sector wage levels is not conceptually or statistically strong
 - independent consultants have differing views on aspects of the Commission's approach
 - COVID-19 has highlighted weaknesses in the Commission model.

Commission response

The changes to the method for assessing wage costs in the 2025 Review are expected to improve the reliability and reduce the volatility of the wages assessment. However, uncertainty from the use of private sector proxy data, as identified in the Commission's consultant's report, remains. There are also some differences between state private sector labour markets that are not fully controlled for in the Commission's model. This continues to justify some discounting. On balance, the Commission considers the existing 12.5% discount remains appropriate.

Commission decision

76 The Commission will maintain a 12.5% discount on the wage costs assessment, reflecting continuing uncertainty about measurement issues and the strength of the private sector wages proxy.

Wage to non-wage costs

- 77 The wage costs assessment is only applied to wage-related expenditure. The Commission classifies spending as 'wage related', 'non-wage related' or 'other'. The wage related proportion of the 'other' (unattributed) spending is estimated using the proportion of 'wage related' to 'non-wage related' costs.
- In the 2020 Review, the Commission considered that these classifications were unreliable for housing, roads and transport due to relatively low 'wage related' costs and relatively high 'other' costs. For these categories, the wage related proportion of all costs was estimated as the average wage related proportion of all other categories.
- 79 Victoria raised concerns with this approach, stating that it greatly overestimated the wage related proportion of expenses in those categories. Housing, roads and transport are more capital intensive than other assessments and have a lower wage related proportion of expenses than the average.
- 80 In response to concerns, the Commission proposed to impute 'other' costs in all categories based on the ratio of total 'wage related' and 'non-wage related' spending.

State views

81 No state raised objections to changing the way housing, roads and transport wage shares of expenses are imputed.

Commission decision

The Commission will treat all categories in the same manner and estimate wage costs by applying the ratio of overall total wage to non-wage expenses to the 'other' (unattributed) expenses in every category.

GST impacts of method changes

83 The impact on the GST distribution from the method changes is shown in Table 2.

Table 2 Impact on GST distribution of method changes, wage costs, 2024–25 to 2025–26

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Total effect
	\$m								
Changes to model	-79	211	-237	-104	118	77	60	-46	465
Smoothing	-83	85	139	-243	47	53	0	2	326
Changes to wage proportions	-33	-1	40	-24	23	7	-9	-3	69
Total	-194	295	-58	-370	187	136	51	-47	669
	\$pc								
Changes to model	-9	29	-41	-34	62	133	124	-180	17
Smoothing	-10	12	24	-79	24	91	0	8	12
Changes to wage proportions	-4	0	7	-8	12	12	-19	-11	2
Changes to wage proportions	-4	U	/	-0	12	12	-13	-11	2

- Wage costs are assessed in all expense categories and represent a very large proportion of total state expenditure. As such, even relatively small changes to the wage costs assessment method can have large effects on the GST distribution.
- The largest effects of changing the model were due to the shift from usual hours to paid hours resulting in a closer relationship between wages and hours worked. The new model more appropriately captures the effects of hours worked on wages, preventing the higher weekly wages of individuals working longer hours being inappropriately attributed to other factors, such as their state of residence.
- New South Wales and Western Australia had average estimated relative wages in 2020–21, 2021–22 and 2022–23 above their trend levels, and so smoothing has reduced their assessed GST needs.
- The assessed wage shares of costs in housing, transport and roads have been reduced (changes in wage proportions in Table 2). The effect of these changes varies for each state depending on their relative needs for spending in these areas and their relative wage levels.