

# Temporary-Permanent Wage Gap: Does Type of Work and Location in Distribution Matter?

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## Abstract

*Recent years have seen a push for greater labour market flexibility and an accompanying upsurge of interest in temporary employment and the negative outcomes often associated with such employment arrangements. This study focusses on the pay outcome with respect to the temporary workforce in New Zealand. This country is a useful case study for such analysis, because of the low levels of employment protection legislation afforded to temporary workers relative to the rest of the OECD. We utilise decomposition analysis to assess the size and significance of unexplained wage gaps for both the aggregate group of temporary workers and the subgroups of fixed-term, casual, temporary agency and seasonal workers. Our findings signal that the majority of the temporary-permanent wage differences can be explained by observable characteristics, with no wage gap evident for fixed-term workers. We also find varying effects across the wage distribution. Quantile analysis points to a widening wage gap (particularly for casual and temporary agency workers) towards the upper end of the wage distribution, with a growing proportion of the gap that is unexplained.*

Keywords: temporary work, compensating wage differential, quantile regression  
JEL: J7, J8, J31

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## Disclaimer

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## 1 Introduction

The incidence of temporary employment has risen in many developed countries in the last three decades (Eurofound, 2015). Policy makers view encouragement of a range of temporary contracts as one of the potential routes towards greater labour market flexibility; with policy discussion on this front often heightened at times of high unemployment. However, there is also a plethora of empirical research citing numerous negative impacts or associated outcomes for individuals in temporary work. For instance, Booth *et al.* (2002) and Kahn (2007) show that pay and job satisfaction are lower in temporary jobs. Adverse effects on occupational health and safety have also been identified (see Quinlan, 2003; and Francois and Lievin, 2000). Additionally, there is greater risk associated with temporary work due to poorer job security. Compensating wage theory could therefore be used to argue that temporary workers should earn a wage premium relative to comparable permanent workers, as compensation for the additional inherent risks. There is however no consistent empirical evidence of this being a feature of labour markets, with much past evidence pointing to temporary workers earning substantially less relative to permanent employees (Brown and Sessions, 2005).

A variety of reasons have been advanced to account for the rising numbers of temporary workers (see for example De Cuyper *et al.*, 2008). These reasons include free choice whereby workers choose temporary work because of the inherent and potentially preferable characteristics (Morris and Vekker, 2001, reported that one in four temporary workers wanted temporary work, as they needed flexibility, shorter hours, or needed to accommodate childcare arrangements or other family reasons); whereas others end up in temporary employment because of a lack of suitable permanent employment opportunities; and many workers enter temporary employment hoping that it will eventually turn into a permanent contract. Burgess (1997) attributes rising levels of non-standard employment (where standard employment equates to full-time ongoing wage employment) to three drivers. First, structural shifts in the economy in terms of composition of industries and occupational categories. Second, demographic forces via a significant increase in female labour force participation, requiring a strong motivation for new working arrangements that are compatible with family responsibility (Hall *et al.*, 1998). Third, cyclical reasons – particularly at times of high unemployment, when policy makers push for reduced labour market protection and rigidity. Times of recession can undermine the bargaining power of workers, resulting in a pool of unemployed and underemployed individuals, who are willing to accept employment under less favourable conditions, and in non-standard forms.

From a labour demand perspective, it is not only responsiveness of employers to business cycles that has come to the forefront, but also the need to respond to growing globalisation, and more volatile international market conditions – often forcing employers to be more flexible as they aim to remain competitive in the global economy (Brewster *et al.*, 1997). As a consequence, employment protection legislation (EPL) permitting, employers have sought to respond to these pressures by introducing new technologies and reducing their reliance on full-time labour in favour of non-standard forms of labour that can be implemented on a just-in-time basis.

There has clearly been a concerted effort to loosen the rigidities that surround EPL across Europe, and much of the recent debate amongst researchers reflects the need to assess whether this has led to the development of a strata of workers locked into precarious or temporary employment. Standing (2011, p.31), for instance, argues that 'The pursuit of flexible labour relations has been the major direct cause of the growth of the global precariat'. Standing also contends that the drive for flexibility is ongoing, with the push for more flexibility increasing at times of an economic downturn, resulting in an erosion of all forms of job security.<sup>2</sup> Given these sentiments, New Zealand (NZ) presents as a very useful case study to assess the potential outcomes associated with low levels of EPL. OECD indicators on EPL are based on a scale from 0 (least restrictions) to 6 (most restrictions). The OECD average for regulation on temporary employment is 2.07 (based on the most recent data – from 2013) and NZ's value on this scale is just 0.92, with only three countries having fewer restrictions, in terms of employment protection for individual dismissals for temporary contracts.<sup>3</sup> Additionally, a World Bank (2004) report which benchmarks business regulations across more than a hundred countries, ranked NZ 10<sup>th</sup> in terms of labour market flexibility and 5<sup>th</sup> in the OECD.

The majority of the deregulation in NZ's labour market occurred prior to 2000. However, there are a few recent examples available of legislation aimed at increasing flexibility. For instance, the 90-day trial period was introduced in April 2011, which meant that an employer can dismiss a new employee within 90 calendar days, 'without the employee being able to take a personal grievance for reasons of unjustified dismissal' (Department of Labour, 2015).<sup>4</sup> Another recent example involves political intervention by the central government in the Hobbit Film dispute, via the introduction of the Employment Relations (Film Production Work) Amendment Bill (see Walker and Tipples, 2011) in 2010. This bill was widely viewed as a deal required during negotiations between Warner Bros and the NZ government, to keep production of *The Hobbit* film in NZ. It essentially made film production workers independent contractors by default, rather than employees.

Given the very low levels of EPL in this country, if in general greater labour market flexibility is associated with greater levels of discrimination against the temporary workforce, we would expect that this would be more evident in the NZ case, relative to its OECD counterparts. On the other hand, given poor levels of protection are also experienced by permanent workers in NZ – this may result in an opposing effect and thus reduce the temporary-permanent wage gap. This study therefore seeks to empirically investigate the existence and extent of unexplained wage differences between temporary and permanent workers in NZ. While we acknowledge the numerous other potential negative outcomes associated with temporary work, such as poorer health status, lack of access to tenure related benefits and job insecurity,

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2 Standing (2011) identifies seven forms of job insecurity – labour market, employment, job, work, skill, income, and representation security.

3 See OECD (2015a). There are also similarly low levels of employment protection for permanent workers against both individual and collective forms of dismissal.

4 See <http://www.dol.govt.nz/workplace/knowledgebase/item/1517>. This trial period is voluntary and must be agreed to by both employer and employee when setting up the employment agreement.

this study is focussed only on the wage gap prevalent between an average permanent employee and a temporary worker.

Based on our research objective at hand, we make use of pooled cross-sectional data from two waves of the Survey of Working Life (SoWL). This data provides information on not only the aggregate group of temporary workers, but the subgroups that lie beneath this – fixed-term, casual, seasonal and temporary agency workers. Analysis of these disaggregate groups is essential as past research is explicit in its view that temporary employees cannot be treated as a homogenous group (see Silla *et al.*, 2005).

We use the Blinder-Oaxaca technique to gain an understanding of the underlying reasons behind the wage gap. This method is fairly commonplace when assessing compensating wage differentials (although mostly employed when comparing private and public sector pay rates, rather than permanent and temporary workers e.g. Lucifora and Meurs (2006)). To our knowledge, it has not been used to empirically assess the existence of a pay gap for both the aggregate group of temporary workers (compared to permanent employees) as well as for disaggregate groups such as fixed-term contractors, casual, seasonal, and temporary agency workers (all relative to their permanent counterparts).

After producing average effects using the decomposition method for each of the groups outlined above, we investigate whether these hold constant across the wage distribution, with the help of quantile regressions. This provides evidence of the dynamics of the raw gap across the distribution, as well as the proportion of the gap that can be explained by observable characteristics.

The remainder of this paper is set out as follows: Section 2 summarises the relevant theoretical and empirical literature on a temporary-permanent wage gap; Section 3 provides details of the data employed and a descriptive portrait of temporary versus permanent workers in NZ; while Section 4 presents the empirical analysis and results. Conclusions follow.

## 2 Literature review

### 2.1 Theoretically

As indicated in the introduction, one theoretical argument for the existence of a wage difference between temporary and permanent workers is that of compensating wage differentials. The contention being that a competitive labour market will reward poor job security, and the other risks associated with a temporary job. However, one could also argue (with the aid of human capital theory) that the firm has to invest in greater levels of firm-specific training for temporary workers, and the wage gap is a result of this additional cost.

Labour segmentation (or Dual Labour Market) theory has also been called upon to explain wage gaps between temporary and permanent workers. Reich *et al.* (1973) was one of the early studies to define this concept and segregate the market into primary and secondary segments. Primary jobs are characterised with mostly permanent workers, who are well paid, with stable work environments, and the existence of job ladders. Whereas the secondary market is characterised by poorer

working conditions and includes temporary workers who experience higher turnover, fewer job ladders, and insecure work environments.

Another theory advanced to explain the temporary–permanent wage gap is the efficiency wage argument. Guell (2003) claims that contract renewal of a temporary contract could be used as a carrot to incentivise greater productivity from workers. Of course this signal only works if credible and firms follow through with non-renewal of poor performing temporary workers. Additionally, this method cannot be used long-term if EPL does not support repeated renewal of fixed-term contracts. For instance, in NZ, the Employment Relations Act (2000) limits the use of fixed-term contracts to instances where there are genuine reasons - like seasonal work, project work, or where the employee is filling in for a permanent employee on leave. Repeatedly ‘rolling over’ of a fixed-term employment agreement may well lead to the employee being deemed to be a permanent employee (Ministry of Business, Innovation and Employment, 2012).

It also seems key from the extant literature that employer costs are the motivation behind many of the reasons put forth for not only wage differentials between temporary and permanent workers, but also behind the growth of the temporary workforce. For instance, if firing costs are high, fixed-term contracts may be employed as a screening device to help employers find appropriate employees. High firing costs also means that it is more efficient for a firm to have a pool of both temporary and permanent workers (even if they are relatively homogenous and can be treated as perfect substitutes), because the former can be treated as a buffer stock towards dealing with fluctuations in demand.

Also of relevance to this study are the theories that have been advanced to motivate why the temporary–permanent wage gap would vary across the wage distribution. Comi and Grasseni (2012) use labour segmentation theory to explain why we might find a wider wage gap at the bottom of the wage distribution. Due to the dual nature of the labour market more temporary workers are found at the lower end of the wage distribution, and therefore there is greater potential for a wage disadvantage at this end. The same authors also use the insider/outsider argument and claim that when temporary jobs are used as a default buffer stock of workers, this implicitly results in greater protection and bargaining power for the insiders.

## **2.2 Empirically**

The majority of previous empirical studies have focused on mean wage differentials (see OECD (2004) and Bentolila *et al.* (1994)). Analysing explicitly the size and source of the wage gap can be found in just a handful of articles. For instance, Jimeno and Toharia (1993) compare fixed-term workers with their permanent counterparts in Spain and find the former earn approximately 9–11 per cent less than the latter group. In a German study also focussed on the wage effects of fixed-term contracts, Hagen (2002) finds a wage gap of between 6–10 per cent; which increases to 23 per cent once they control for selection on unobservables. The likely reason behind the larger gap when selection bias is corrected for is that unobservables (such as quality of worker, not captured by education, and experience observed) simultaneously increase the likelihood of an individual being a fixed-term worker and experiencing a wage disadvantage.

In general, much of the relevant literature has emanated from Europe, although there has been one NZ study<sup>5</sup> to deal with this research topic. Dixon (2011) uses the first wave of the data that is employed in this study (Survey of Working Life, 2008), Dixon provides some preliminary insights on the temporary workforce portrait in NZ. She also estimates the gap in average hourly earnings between temporary and permanent workers and initially finds a gap of 21 per cent, which can mostly be attributed to differences in demographic, occupation and industry characteristics. The only exception to this result was female casual workers, where even after adjusting for relevant covariates, this subgroup earned less than their counterparts in permanent jobs.

Another notable non-European study is that by Segal and Sullivan (1997), who focus on the temporary help services industry in the United States. The authors show the raw percentage difference between temporary and permanent wages to be approximately 22 per cent (although this varies substantially depending on which subgroup of workers the analysis focusses on – e.g. a raw difference of 13.4 per cent for white collar workers, and a 29.4 per cent difference for blue collar workers). After controlling for relevant observables, in terms of determinants of wages, the gap for the whole sample falls to just 3.1 per cent. The determinants controlled for in these specifications include factors such as age, gender, ethnicity and education, regional information and job and occupational characteristics.

It is also important to recognise that wage differences may not only be short term. Booth *et al.* (2002) find evidence of a substantial wage growth penalty associated with the experience of temporary employment. Based on data from the British Household Panel Survey from 1991 to 1997, the authors highlight that men who start their careers with a fixed-term contract suffer a long term earnings loss compared to men who enter the workforce in permanent positions. A more recent study by McGinnity *et al.* (2005) for Germany, also compare those who begin working life with a fixed-term contract versus permanent job, and find that the unemployment rates of these two groups converge after five years. The authors argue that starting your working life in a temporary contract may not be a ‘bad start’ after all.

Scherer (2004) argues that labour (im)mobility is key to assessing wage gaps for temporary workers (relative to their permanent counterparts) across countries. For example, she compared evidence between Germany, Great Britain, and Italy and found distinct differences in the magnitude of wage differences uncovered.<sup>6</sup> Great Britain exhibited the smallest wage gaps, potentially indicating less wage discrimination and/or also reflecting less labour market rigidity and immobility, and greater transferability of skills and qualifications across professions.

Jahn and Pozzoli (2013) add a further dimension to the empirical evidence by illustrating that the intensity of temporary work plays a role in determining the temporary-permanent wage gap. They define the treatment intensity as either the cumulative number or the duration of previous temporary jobs across the preceding five years. Within a panel framework they show that the wage disadvantage is high when treatment intensity is low, and decreases as the intensity level rises. They

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5 Other works such as Ongley *et al.* (2013) are largely descriptive.

6 Gebel (2010) compared Germany and Great Britain and also found similar results.

speculate that this may be due to an accumulation of human capital the longer they work in the temporary sector.

More recently, a small number of studies have examined the extent of a wage disadvantage for temporary workers at not just the aggregate level, but also across the entire wage distribution. This accounts for the relative importance of observed characteristics and skills at varying levels of the wage distribution. Comi and Grasseni (2012) use data from nine European countries – Austria, Greece, Hungary, Ireland, Italy, Poland, Portugal, Spain, and the UK – and find a permanent wage premium in almost all countries sampled. This result was also consistent across the wage distribution, and suggested widespread discrimination against temporary workers. Further weight was placed on this argument when it was also found that the wage gap appeared to increase, with greater levels of employment protection for permanent jobs.

Bosio (2009) uses Italian data from 2006 and also examines how the wage gap differs across the wage distribution, by employing quantile regressions. He finds a wider wage gap at the bottom of the distribution (of approximately 30 per cent), which slowly decreases as movement is made toward the top of the wage distribution. A similar methodology was utilised in Mertens *et al.* (2007) with both Spanish and German data. The results show the lack of generalizability of findings from one country to another. At odds with the result from the Italian study, Mertens *et al.* (2007) show evidence of a relatively even wage penalty (for Spain) across the wage distribution.

With respect to the Australian context, Lass and Wooden (2017) use panel data to show that the wage difference between temporary and permanent workers not only varies across the distribution, but also depending on the type of temporary worker. They find evidence of a wage penalty for casual workers at the low end of the distribution, as well as a wage premium at the top end of the distribution. In comparison, they find little difference in pay between fixed-term contractors and permanent workers.

What inferences can be drawn from the empirical evidence thus far? It is important to control for observable characteristics, including the usual host of covariates that often explain wage levels. Labour market institutions are also important – and may play a mediating role in determining the existence and magnitude of a wage disadvantage for temporary workers. And finally, disaggregate analysis across the wage distribution is also necessary to better understand whether any unexplained wage gap varies across this distribution.

The following analysis will contribute to the growing empirical evidence on temporary-permanent wage gaps on two fronts. First, all the analysis in this paper is done for both the aggregate group of temporary workers, as well as for each of the subgroups. These disaggregate insights are an important contribution to the extant literature, as there is a lack of evidence with regard to some of these subgroups – such as casual workers, seasonal and temporary agency. Second, as almost all previous studies have shown – context is important. Therefore, investigating the potential incidence of unexplained wage differences between the temporary and permanent workforce in a country where EPL is extremely minimal, presents as a useful case study, with potential policy implications for those involved in debating the furtherance of loosening EPL across other OECD countries.

### 3 Data and Descriptive Statistics

This study makes use of pooled data from the two waves of Survey of Working Life (SoWL - 2008, 2012). These data are the first attempt in NZ to gather official statistics about the size of the temporary sector and a range of associated characteristics. In the one NZ study that examines the temporary-permanent wage gap, Dixon (2011) makes use of the first of these waves and presents important insights into the portrait of the temporary workforce in NZ. Prior to Dixon's paper, there was very little, if any concrete information on how many of NZ's workforce were employed in a temporary job. Campbell and Brosnan (2005) in a comparison of the casual workforce between Australia and NZ, lament the lack of data on size and nature of casuals in NZ, indicating there is limited case study research to fill the knowledge gaps. They rely on two phone surveys (in 1993 and 1997 by the Department of Labour) and their own workplace survey conducted in 1995 to arrive at a figure of around 11 per cent of the workforce as 'occasional', 'temporary' and 'fixed-term'. Dixon (2011) finds a similar proportion for 2008 of approximately 10 per cent.

The SoWL was carried out by Statistics NZ and was run as a supplement to the Household Labour Force Survey in 2008 and 2012. It collected information on a wide array of people's employment conditions, arrangements and quality of working life (in terms of flexibility, training and health and safety). Each employee was asked if they were employed on a permanent or temporary basis, and if it were the latter, they were then asked if their employment relationship could be classified as fixed-term, casual or temporary agency.

In this context fixed-term workers are those employees who are hired until a fixed date is reached or a project completed. Casual workers are those workers who only work when their employer asks them to, on an as-needed basis and do not have any guarantee of regular ongoing work. Temporary agency workers are employed through an employment agency and perform work at the premises of a third party. Lastly, seasonal workers are those whose job is only available at certain times of the year. The employment protection and minima applicable to temporary workers in NZ are generally low. While permanent employees also face minimal protection, temporary workers have reduced entitlements for sick and maternity leave, and the use of 90-day trial periods may be more likely to impact workers who move through a number of short term spells of employment with different employers. Unlike the Australian case casual workers do not attract a loading on their hourly pay except in some circumstances where casuals receive a loading of 8 per cent in lieu of holiday pay.

As Table 1 illustrates 1,614 of our sample are classified as temporary (which equates to approximately 9.5 per cent of the total sample). Just under half of the temporary workers were casuals, 28 per cent were fixed-term, around 13 per cent were seasonal and finally 8 per cent were classed as temporary agency workers. The asterisks in the 2<sup>nd</sup> column of the table (the temporary subgroup) reflects whether the differences in the means in that column, relative to the column to the left (the permanent subgroup) are statistically significant.

In general, it appears that workers on a temporary contract were more likely to be female (62 per cent), younger, and of Māori ethnicity (15 per cent). The picture in terms of educational attainment is not clear cut, with temporary workers less likely to have post-school qualifications (relative to their permanent counterparts), but also more likely to have a degree qualification. As shown in the third and fourth columns, where the temporary group is split up into fixed term contractors and all other forms of temporary workers, the mixed educational attainment picture for temporary workers is driven by the heterogenous nature of this group. In particular, it is clear that fixed term contractors have a significantly different educational profile to other forms of temporary workers. They are three times more likely to hold post graduate qualifications, and more than two and a half times more likely to have a university degree.

In terms of occupational characteristics, temporary workers were more likely to be labourers, and less likely to be managers (with these differences significant at the 1 per cent level). They were concentrated more in agriculture, forestry, fishing; accommodation and food services; or education and training, and were also more likely to be working part-time (49 per cent versus 19 per cent of permanent workers) and lack union representation.

Table 1: Definitions and descriptive statistics: Pooled 2008 &amp; 2012 SoWL

Variable	Definition	Means			
		Permanent	Temporary	Fixed-term	Other temporary
Ln real hourly wage	Natural logarithm of average hourly earnings from main job (deflated by CPI)	3.010	2.813***	3.020	2.732***
Temporary	Dummy variable: 1 = temporary worker; 0 = permanent worker	-	1.000	1.000	1.000
Fixed-term	Dummy variable: 1 = fixed-term contractor; 0 = otherwise	-	0.283	1.000	-
Casual	Dummy variable: 1 = casual worker; 0 = otherwise	-	0.496	-	0.698
Temporary agency	Dummy variable: 1 = temporary agency worker; 0 = otherwise	-	0.081	-	0.114
Seasonal	Dummy variable: 1 = seasonal worker; 0 = otherwise	-	0.134	-	0.188
<i>Personal characteristics</i>					
Male	Dummy variable: 1 = Male; 0 otherwise	0.476	0.378***	0.316	0.402***
Age	Age in years	41.041	36.820***	37.781	36.448*
NZ European	Dummy variable: 1 = NZ European; 0 otherwise	0.791	0.752***	0.811	0.733***
Māori	Dummy variable: 1 = Māori ; 0 otherwise	0.112	0.143***	0.114	0.152*
Pacific	Dummy variable: 1 = Pacific peoples; 0 otherwise	0.057	0.061	0.035	0.072***
Asian	Dummy variable: 1 = Asian; 0 otherwise	0.083	0.087	0.088	0.086
Melaa	Dummy variable: 1 = Middle Eastern, Latin American or African; 0 otherwise	0.006	0.011**	0.004	0.013
Other ethnicity	Dummy variable: 1 = ethnicity not listed above; 0 otherwise	0.017	0.022	0.013	0.024
No school qual	Dummy variable: 1 = highest education is below high school; 0 otherwise	0.257	0.260	0.132	0.310***
School qual	Dummy variable: 1 = highest education is school qualifications; 0 otherwise	0.147	0.206	0.147	0.230***
Post school qual	Dummy variable: 1 = highest education is post school qualifications; 0 otherwise	0.394	0.317***	0.318	0.316
University	Dummy variable: 1 = highest education is a university degree; 0 otherwise	0.137	0.148***	0.265	0.103***
Post grad	Dummy variable: 1 = highest education is a post graduate qualification; 0 otherwise	0.065	0.069	0.138	0.041***
Non-immigrant	Dummy variable: 1 = born in NZ; 0 otherwise	0.764	0.769	0.724	0.787***
Immigrant ≤ 5 years	Dummy variable: 1 = Not born in NZ & lived in NZ ≤ 5 years; 0 otherwise	0.075	0.077	0.105	0.066***

Immigrant > 5, ≤ 10 years	Dummy variable: 1 = Not born in NZ & lived in NZ > 5 years & ≤ 10 years; 0 otherwise	0.040	0.045	0.039	0.048
Immigrant > 10 years	Dummy variable: 1 = Not born in NZ & lived in NZ > 10 years; 0 otherwise	0.121	0.108	0.132	0.098**
<i>Occupational characteristics (ANZSCO level 1)</i>					
Dummy variables (8):	1 = Managers; 0 otherwise	0.133	0.050***	0.068	0.044*
	1 = Professionals; 0 otherwise	0.140	0.138	0.281	0.080***
	1 = Technicians and Trades Workers; 0 otherwise	0.153	0.110***	0.182	0.081***
	1 = Community and Personal Service Workers; 0 otherwise	0.143	0.155	0.167	0.150
	1 = Clerical and Administrative Workers; 0 otherwise	0.128	0.142	0.114	0.154**
	1 = Sales Workers; 0 otherwise	0.109	0.116	0.064	0.138***
	1 = Machinery Operators and Drivers; 0 otherwise	0.082	0.051***	0.033	0.058**
	1 = Labourers; 0 otherwise	0.112	0.239***	0.092	0.295***
<i>Industry classifications (ANZSIC level 1)</i>					
Dummy variables (19):	1 = Agriculture, forestry, fishing and hunting; 0 otherwise	0.040	0.104***	0.042	0.129***
	1 = Mining; 0 otherwise	0.004	0.001*	0.002	0.001
	1 = Manufacturing; 0 otherwise	0.140	0.138	0.118	0.145
	1 = Electricity, gas and water supply; 0 otherwise	0.008	0.002**	0.007	0.001**
	1 = Construction; 0 otherwise	0.069	0.037***	0.031	0.040
	1 = Wholesale trade; 0 otherwise	0.052	0.030***	0.029	0.031
	1 = Retail trade; 0 otherwise	0.132	0.090***	0.070	0.098*
	1 = Accommodation and Food Services; 0 otherwise	0.050	0.081***	0.026	0.102***
	1 = Transport and storage; 0 otherwise	0.043	0.028***	0.088	0.034**
	1 = Information Media and Telecommunications; 0 otherwise	0.016	0.012	0.011	0.012
	1 = Finance and Insurance; 0 otherwise	0.032	0.012***	0.015	0.010
	1 = Rental, Hiring and Real Estate Services; 0 otherwise	0.053	0.042*	0.026	0.049**
	1 = Professional, Scientific and Technical Services; 0 otherwise	0.050	0.037**	0.059	0.028***
	1 = Administrative and Support Services; 0 otherwise	0.036	0.095***	0.099	0.094

	1 = Public Administration and Safety; 0 otherwise	0.080	0.067*	0.094	0.057***
	1 = Education and Training; 0 otherwise	0.066	0.126***	0.024	0.082***
	1 = Healthcare and Social Assistance; 0 otherwise	0.101	0.069***	0.092	0.060**
	1 = Arts and Recreation Services; 0 otherwise	0.008	0.015***	0.011	0.017
	1 = Other Services; 0 otherwise	0.021	0.014*	0.022	0.010**
<i>Other job related characteristics</i>					
Union member	Dummy variable: 1 = union member; 0 otherwise	0.170	0.134***	0.193	0.112***
Tenure	Tenure in current job (weeks)	320.11	124.80***	97.669	135.754***
Part time	Dummy variable: 1 = working part time (less than 30 hours in main job); 0 otherwise	0.193	0.489***	0.336	0.548***
<i>Household characteristics</i>					
Sole parent	Dummy variable: 1 if sole parent; 0 otherwise	0.050	0.069***	0.054	0.074
Children under 6	Number of children in household under the age of 6	0.266	0.250	0.254	0.248
Children 6 to 16	Number of children in household aged more than 5 and less than 16	0.749	0.729	0.695	0.740
Sample size		15,342	1,614	456	1,149

Notes: \*\*\*, \*\* and \* reflect significance of the differences between the temporary and permanent subgroups (in column 2) and significance of the differences between fixed term contractors and other forms of temporary workers (in column 4), at the 1%, 5% and 10% level respectively. The sample sizes have been randomly rounded to base 3 due to confidentiality requirements by Statistics NZ.

## 5 Empirical analysis

### 5.1 Decomposing the temporary–permanent wage gap

As indicated in Table 1, temporary employees receive a lower average hourly wage than their permanent counterparts. Converting the real hourly wage (in natural log terms) back into dollars shows that the figure for an average temporary employee is \$16.66, and for a permanent employee is \$20.29.

The hourly wage here is taken from the response to the SoWL question ‘what was your basic, ordinary time hourly rate last week?’ i.e. it is the base wage of the employee before tax and excluding overtime.

Decomposing the raw wage gap can be done via the Blinder-Oaxaca procedure (Blinder, 1973; Oaxaca, 1973), which splits the wage differential into two components. These are the ‘explained part’ (i.e. the proportion of the raw wage gap that can be explained by observable covariates included in the model) and the ‘unexplained part’ (which is routinely used as a proxy for discrimination). We begin our analysis with trialling five separate models (labelled A – E in Table 2), each of which subsequently adds further covariates. Model A includes just personal characteristics, such as age, ethnicity, educational attainment, and immigrant status; Model B includes the covariates from Model A, and adds occupational characteristics; Model C controls for industry sector in an additive manner; and Model D includes all aforementioned variables, and other job related characteristics, such as union status, tenure, and a dummy for being a part timer. Occupational and industry controls capture measures of both vertical and horizontal labour market segmentation respectively, by controlling for the particular distribution of temporary jobs across different occupations and sectors of the economy. Finally, Model E includes all controls listed for Model D and adds in household characteristics related to family structure and age and number of children.

The two-fold decomposition can be expressed by the following equation:

$$\bar{w}_P - \bar{w}_T = (\bar{x}_P - \bar{x}_T)\hat{\beta}_P + \bar{x}_T(\hat{\beta}_P - \hat{\beta}_T) \quad (1)$$

Where  $\bar{w}_P$  and  $\bar{w}_T$  are the predicted means of log hourly wages for permanent and temporary workers respectively; the first part of the right hand side of equation (1) is the explained proportion of the wage differential ( $\bar{x}_P$  and  $\bar{x}_T$  are the average values of covariates for each category of worker and  $\hat{\beta}_P$  and  $\hat{\beta}_T$  are the estimated parameters); and the second part of the right hand side of equation (1) captures the unexplained proportion of the wage gap. A positive value for this second part will represent a temporary wage disadvantage. Of course, we must also acknowledge that while this may represent wage discrimination against temporary workers, it may also reflect differences in unobserved or omitted characteristics for both categories of workers.

As Table 2 illustrates, the wage gap (regardless of the model employed – from model A to E) equates to approximately an 18–20 per cent temporary wage gap. It is evident from Table 2 that moving from Model A through to E, results in an increasing proportion of the wage gap being explained. At first, when only personal characteristics are controlled for (in model A), just 41.81 per cent of the wage gap

is explained (7.81 per cent points out of a 18.68 per cent pay gap); and by time we arrive at Model E, where personal, occupation, industry, other job characteristics and household information are accounted for, the explained proportion rises to just under 91 per cent (17.85 per cent points out of a 19.65 per cent pay gap). It is important to note that industry, occupation and other job-related characteristics account for a sizeable proportion of the gap – at just under 50 per cent. This corresponds with the argument that it is segmentation across the labour market (both horizontal and vertical) that is driving wage differences between temporary and permanent workers, more so than individual and household characteristics.

Table 2: Blinder-Oaxaca decomposition, dependent variable = ln real hourly wage

	<i>Explained (%)</i>	<i>Unexplained (%)</i>
Model (A): With only personal characteristics Overall pay gap = 18.68% ***	7.81***	10.88***
Model (B): Model (A) + occupation controls Overall pay gap = 18.68% ***	11.31***	7.37***
Model (C): Model (B) + industry sector controls Overall pay gap = 18.68% ***	12.70***	5.98***
Model (D): Model (C) + other job related characteristics Overall pay gap = 19.65% ***	17.66***	1.99**
Model (E) – Model (D) + household characteristics Overall pay gap = 19.65%***	17.85***	1.80**

Note: \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.  $N = 16,953$

At this point it is important to note that temporary employment in NZ encompasses a diverse range of jobs, with fixed-term workers being very similar to permanent employees, and distinctly different to casual/temporary agency, or seasonal workers. We therefore repeat the decomposition (via the full specification in Model E) for the various categories of temporary worker versus permanent employment, and these results are portrayed in Table 3.

Table 3: Blinder-Oaxaca decomposition for different types of temporary employment  
Dependent variable = ln real hourly wage

	<i>Overall pay gap (%)</i>	<i>Explained (%)</i>	<i>Unexplained (%)</i>
All temporary	19.65***	17.85***	1.80***
Fixed-term	-1.01	2.08	-3.09*
Casual	30.35***	26.07***	4.27***
Temporary agency	27.03***	20.64***	6.39**
Seasonal	18.41***	18.65***	-0.24

Note: \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

There are several noteworthy findings in Table 3. To begin with fixed-term workers appear to be paid more than permanent workers (after controlling for all relevant covariates) – although this difference is small and statistically insignificant. For seasonal workers, the wage gap is similar to that of the aggregate group of temporary workers and is completely explained by observable characteristics. The unexplained component for the seasonal subgroup equates to just -0.24 per cent and is statistically insignificant.

The largest wage gaps (with respect to permanent workers) are for casual and temporary agency workers, with gaps of 30.35 per cent and 27.03 per cent respectively. Although, in a similar fashion to the aggregate group of temporary workers, a sizeable proportion of the gap can be explained. The relevant proportions are 85.90 per cent for casuals and 76.34 per cent for temporary agency workers.

The findings from Table 2 and 3 illustrate that aside from fixed-term workers (where there is no gap), for all other types of temporary employment (where the wage gap ranges from 18 to 30 per cent), the majority of the temporary-permanent wage gap can be explained by observable characteristics. These characteristics cover a wide array of individual, household, industry, occupation, and other job characteristics.

There are of course a couple of caveats that must accompany these results to hint at the potential limitations of the specifications utilised in both Table 2 and 3. The first limitation is the classical problem of sample selection bias (Heckman, 1979). The wage is observed only for those who participate in the labour market, and as a consequence the sample observed may not represent the true underlying population. The decision to enter the labour market may be correlated with an individual's potential wages, meaning that any analysis that is limited to just the employed may be potentially biased. Problematically though, to correct for this potential selection bias, we need to observe those who would be temporary and permanent workers outside the labour market. In the traditional applications of Heckman's correction, the two groups often compared are men and women, and as such it is easy to see which group they belong to, regardless of whether they are in or out of the labour market. Unfortunately, the same cannot be said for temporary

versus permanent workers.<sup>7</sup>

The second limitation with these decomposition results are endogeneity related. The choice of working in temporary or permanent employment is not exogenous. However, to deal with accounting for endogenous selection we need an adequate set of instruments to identify the selection effects. One example of a potential instrument (as used by Picchio (2006); and Bosio (2009)) is a job search variable. An indicator of searching for another job may be positively correlated to the type of employment contract, as temporary employees could have a higher likelihood of searching for a role to replace their temporary contract. Unfortunately, we do not have a similar variable in the SoWL, and find no valid instrument in our data.

Lastly, in addition to the problem of endogeneity, coefficient estimates maybe biased through the omission of unobserved variables such as intelligence or motivation that are likely to play a role in the determination of an individual's wage. While techniques, such as panel models, exist that can account to some extent for this we are limited here by the pooled cross sectional nature of our data (Belbo *et al.*, 2003).

With these caveats in mind, we must be careful not to make any causal inferences from our decomposition analysis. Instead, we should focus on the contributions of these methods in providing further insights for subgroups of the temporary workforce, beyond the aggregate group of temporary workers, or only fixed-term contracts, which are common in the past literature.

## 5.2 Quantile Decomposition

In the previous section we relied on the Blinder-Oaxaca decomposition to explore the unexplained wage gap between temporary and permanent workers, without considering how the magnitude of this gap may vary at the lower or upper ends of the wage distribution. It would seem plausible to hypothesise that the size of the gap will vary across the wage distribution due to the possible existence of both 'sticky floors' and 'glass ceilings' (Albrecht *et al.*, 2003; Arulampalam *et al.*, 2007; and Carillo *et al.*, 2014). These terms reflect situations where the wage disadvantage for temporary workers is wider at the top and bottom of the wage distribution, respectively.

To investigate this further, we performed an unconditional quantile regression using an approach by Firpo, Fortin and Lemieux (2009). This is essentially a generalisation of the Blinder-Oaxaca decomposition for quantile regressions to assess the wage disadvantage at various points in the wage distribution (10 percentile cut-offs). Table 5 reports the results of this analysis, where the explained component is the part of the pay gap at the relevant quantile of the log wage distribution that can be explained by differences in the means of the explanatory variables (as described in the full specification of Model E) between temporary and permanent workers. The unexplained component is the part of the total gap that cannot be explained, and reflects differences in returns on attributes.

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7 It would also be difficult to hypothesise whether we expect this sample selection bias to be positive or negative with respect to our calculated wage gaps between temporary and permanent workers.

Table 5 : Quantile Regression Decomposition, Percentage Wage Gap.

Percentile	All Temporary		Fixed-term		Casual		Temporary agency		Seasonal	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
10	11.11***	-6.99***	2.66***	-1.42	16.74***	-7.93***	9.71***	-5.97***	8.75***	-5.25**
20	17.47***	-6.79***	4.47***	-3.26*	26.32***	-14.16***	15.73***	-6.25***	12.77***	-7.51***
30	21.40***	-5.38***	2.94	-2.23	32.13***	-12.48***	20.58***	-3.65	16.55***	-5.40**
40	21.93***	1.04	3.88***	-2.79	32.59***	-4.99***	23.71***	0.07	18.94***	-4.29
50	21.63***	2.82**	3.97	-3.95	32.16***	1.71	25.11***	3.89	20.88***	-3.20
60	21.06***	5.37***	2.77	-2.35	30.89***	8.47***	26.93***	7.76**	22.03***	-1.14
70	19.68***	9.91***	3.13	-0.77	28.63***	13.93***	27.08***	12.47***	23.15***	-0.31
80	19.04***	6.99***	1.41	5.04	27.38***	17.06***	27.02***	19.43***	25.01***	3.54
90	17.38***	6.52**	0.04	4.58	23.22***	24.34***	22.39***	23.08*	25.87***	8.02*

Note: \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% levels, respectively.

For temporary workers as a whole the predicted wage gap is significant across the whole wage distribution and increases until the 70<sup>th</sup> percentile before the gap begins to narrow slightly. With the gap generally rising as we move up the wage distribution, this would seem to offer some support to the ‘glass ceiling’ interpretation. Additionally, the unexplained proportion of the gap is higher towards the top end of the distribution, peaking at 33.5 per cent of the total gap at the 70<sup>th</sup> percentile, before falling a little to the 27 per cent mark at the 80<sup>th</sup> and 90<sup>th</sup> percentile.

For fixed-term employment the gap is significant at the bottom end of the wage distribution (10<sup>th</sup>, 20<sup>th</sup> and 40<sup>th</sup> percentile), and insignificant across the rest of the distribution. However, it is economically small, averaging at approximately 1 per cent, indicating a slight ‘sticky floor’. Although it is, of course, worth noting, that this gap is fully explained by observable characteristics.

In terms of comparing the first two sets of results from Table 5 (i.e. all temporary and fixed-term workers) with the international evidence, there are a handful of possible studies to draw on. Mertens *et al.* (2007) found mixed results, with very little variation in the wage gap across the wage distribution, when they compared fixed-term contracts with permanent workers in Spain; and larger pay gaps evident for the lowest earners in Germany. Bosio (2009) also found wider wage gaps at the bottom end of the distribution for fixed-term workers in Italy. While our results for the fixed-term subset of temporary workers indicate a larger gap at the bottom end of the distribution, it is almost fully explained by observables. As such the size of the unexplained gap is actually stable across the wage distribution, and usually statistically insignificant. This is similar to the finding by Lass and Wooden (2017) for Australia, that the wages for fixed-term contract workers (regardless of gender) do not differ significantly to those of permanent workers throughout the majority of the wage distribution.

It is useful to point out here that one reason why we find no evidence of wider gaps at the bottom of the wage distribution (as found in the European based analysis) may be related to the minimum wage framework in NZ.<sup>8</sup> The most recent statistics from the OECD (based on 2013) show that the minimum wage in NZ is 60 per cent of the median wage of full time employees.<sup>9</sup> Only four other countries had a higher relative minimum wage ratio. For instance, if comparing NZ with the United Kingdom, as both have similarly low levels of EPL, the comparable relative minimum wage ratio for the United Kingdom was 47 per cent in 2013. At the low end of the scale was the United States, with a relative minimum wage of 37 per cent. The high relative minimum wage ratio in NZ means that despite low EPL for temporary workers, employers have very little wiggle room at the bottom end of the wage distribution if attempting to discriminate against the temporary workforce. This may explain why the pay gap is smaller at the lower end of the wage distribution.

With regard to the distributive role for casual, temporary agency or seasonal workers, Table 5 shows the results for the casual and temporary agency subgroups

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<sup>8</sup> Holmlund (2014) argues that EPL is just one of three key labour market institutions that shape labour market outcomes. The other two are minimum wages and unemployment insurance.

<sup>9</sup> See OECD (2015b). Based on the minimum wage (sourced from Statistics NZ), and median wage = median usual weekly earnings of full time employees (sourced from the Household Economic Survey, Statistics NZ)

(which are very similar to each other) stand out relative to the other forms of temporary employment. Their pay gap (with permanent workers) grows markedly from the 10<sup>th</sup> to the 90<sup>th</sup> percentile. For instance, for casual workers, the gap starts at 8.81 per cent at the 10<sup>th</sup> percentile, and grows to 47.56 per cent by the 90<sup>th</sup> percentile. Additionally, the unexplained element for the casual-permanent gap is negative at the start of the wage distribution, and steadily rises to equate to just over half of the total gap by the end of the distribution. A similar pattern is evident for temporary agency workers.

There is a definite lack of comparable studies in the international literature to compare with these particular findings. However, recent work by Lass and Wooden (2017), who conduct similar analysis within the Australian context for casual and temporary agency workers, found evidence of a wage penalty for casual workers at the low end of the distribution, as well as a wage premium at the top end of the distribution. For temporary agency workers, they find no difference at the bottom of the distribution, and a large premium at the top end of the distribution. These results are at odds with the findings within the NZ context and may indicate that these are two types of employment contract that warrant deeper investigation in future work, to better understand possible reasons for the 'glass ceiling' effect found.<sup>10</sup>

For the final group of seasonal employment, while the gap does increase with a movement up the wage distribution, the aggregate average results from Table 3 for seasonal workers are for the most part retained in terms of the gap usually being explained by observable characteristics.

## 6 Conclusions

In this paper, we investigate the wage gap between the temporary and permanent workforce, using NZ micro data. Beginning with the standard Blinder-Oaxaca decomposition we show that once relevant observables (in terms of personal, household, occupational, industry and other job characteristics) are controlled for, and in essence these particular endowments of temporary workers are raised to the levels held by permanent workers, the majority of the wage gap can be explained (with just 9.2 per cent unexplained). While noting the exception of fixed-term workers (where there was no evident gap with permanent workers), the general results for the aggregate groups of temporary workers held for the subgroups of casual, seasonal and temporary agency workers. The largest values for the unexplained proportions were 14.1 per cent for casual workers, and 23.6 per cent for temporary agency workers.

Interestingly we find that labour market segmentation accounted for more of the explained wage gap, compared to personal and household characteristics of the worker, indicating the importance of occupation, industry, and other job characteristics.

The second part of the empirical analysis in this paper involved investigating the distributive aspect of the temporary-permanent wage gap via quantile analysis. For most cases, the wage gap grows as we move towards the top end of the wage distribution, lending support for the 'glass ceiling' interpretation. This is particularly

<sup>10</sup> These results should also be interpreted with the caveat that they are based on small sample sizes – as shown in Table 1, temporary agency and casual workers constitute just 8% and 28% of the temporary workforce, respectively.

evident for casual and temporary agency workers. Additionally, these two subgroups stand out from the rest in terms of not just the raw gap itself growing, but also the sizeable growth in the unexplained proportion of the gap. For both subgroups, half of the wage gap is unexplained at the 90<sup>th</sup> percentile in the distribution. Such workers are often used as a ‘buffer stock’, the insider/outsider argument may be most relevant here, with these workers treated as outsiders, and therefore having the least protection, and bargaining power; translating into a higher probability of wage discrimination.

What are the relevant future research avenues from here? First, it is important to recognise that throughout this empirical endeavour we are essentially assuming that similar levels of qualifications, skills, and tenure should equate to similar outputs in terms of worker productivity. However, it could be argued that temporary workers (and in particular, casual workers) lack the requisite organizational specific knowledge and firm-specific social capital, and that this results in lower productivity relative to observably similar permanent workers. Also, permanent workers could have higher levels of unobserved quality that also results in higher productivity levels for this group, relative to the temporary subgroup. Therefore, future research that utilises linked employer-employee data could extract worker quality via fixed effects at the employee-level, for the purposes of holding constant in any wage differential analysis.

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### (Footnotes)

- 1 This category includes those with a university certificate or diploma, a teacher's certificate or diploma, a polytechnic certificate or diploma, a nursing certificate or diploma, a trade certificate, other post school qualifications and post school qualifications of an unspecified nature.