Submission to the Minister for Public Expenditure and Reform on the Role and Methodology of the Public Service Pay Commission

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Introduction

This submission draws on the Economic and Social Research Institute's research on estimating the public-private sector pay differential in Ireland. The submission highlights the approaches used to estimate the public-private sector pay gap in Ireland over recent years, and argues that a lack of clarity and consistency in the approaches adopted to estimating the relationship will have resulted only in complicating the policy discussion. We take the view that, for any available dataset, there is an onus on the researcher to establish the approach to measuring the public-private sector pay differential that will generate the most accurate measure. It is not acceptable to generate a range of estimates, some of which will clearly be erroneous, as this will only serve to confuse the policy debate.

Researchers recognise that comparing the average wage levels of public and private sector workers is highly misleading as there exists clear differences in the characteristics of both sets of workers that are related to earnings. Thus, for example, analysis of the pay differential by Kelly, McGuinness & O'Connell (2009a) found that public sector workers earned 33 per cent more on average than their private sector counterparts. However, when account was taken for differences in levels of education, experience and other wage determining characteristics, the public sector wage premium fell to 21 per cent. This approach, which attempts to isolate the aspect of the wage premium not explained by the superior wage determining characteristics of public sector employees, generally referred to as the unexplained wage gap, is standard in the international literature. The unexplained wage gap is accepted as a much more accurate and firm measure of the public-private sector wage differential relative to a simple comparison of average rates. A number of empirical studies have been carried out over the past decade (Boyle *et al.*, 2004; Ernst & Young and Murphy, 2007; CSO, 2009; Kelly *et al.*, 2009a and 2009b; Foley and O'Callaghan, 2010), all of which have reported a pay premium to public sector workers (see Table 1).

It is fair to say that research of the public-private sector pay gap generally involves researchers making decisions with respect to the most appropriate: i) sample, i.e., the observations to be included within the study; ii) the variables to be included in models designed to isolate the unexplained pay gap; and iii) the most appropriate estimation method to be utilised to estimate the gap. Following this decision making process, the researcher, on the basis of expert opinion, will present a *single* estimate that is deemed to be most accurate given the nature of the data at hand. In the course of this research approach, the researcher will have discarded certain data and model specifications on the basis that they were not suitable either in the context of the current dataset or policy environment.

Table 1: **Estimates of the Public-Private Sector Wage Differential: Ireland**

Author(s)	Time-period	Data	Public Sector Pay Premium	Size of Premium
Boyle, McElligot, and O'Leary (2004)	1994-2001	European Community Household Panel (ECHP)	Yes	13% (monthly); 16% (hourly)
Ernst & Young and Murphy (2007)	March 2003	National Emloyment Survey (NES)	Yes	11% (weekly)
Kelly, McGuinness and O'Connell (2009a)	March 2003 and March 2006	National Emloyment Survey (NES)	Yes	2003: 10% (weekly); 2006: 22% (weekly)
Kelly, McGuinness and O'Connell (2009b)	March 2003 and October 2006	National Emloyment Survey (NES)	Yes	2003: 14% (weekly); 2006: 26% (weekly)
Central Statistics Office (2009)	October 2007	National Emloyment Survey (NES)	Yes	20% (weekly)
Foley and O'Callaghan (2010)	October 2007	National Emloyment Survey (NES)	Yes	17% (weekly)
Central Statistics Office (2012)	October 2009	National Emloyment Survey (NES)	Yes	19% (weekly)
Central Statistics Office (2012)	October 2010	National Emloyment Survey (NES) combined with Revenue administrative data	Yes	17% (weekly)

The standard methodology, therefore, recognises that not all estimation approaches are equal and some, which are unsuitable given the data at hand, are likely to be erroneous and misleading. In particular, estimation of the public-private sector pay gap has been shown to be highly sensitive to the inclusion of measures of organisational size and trade union membership. The estimates have also been shown to vary substantially depending on whether or not the data used to estimate the public-private sector wage differential were weighted. Furthermore, different estimation approaches can lead to very different conclusions around the nature of the public-private sector pay premium, which have important policy implications. In the following sections, we will summarise our views and make recommendations with respect to each of these key elements.

Inclusion of an Organisational Size Variable

With respect to the inclusion of an organisational size control variable in a model of the public-private sector wage gap, it is important to establish exactly why larger firms pay more and the extent to which

such effects are actually captured in the data used. The researchers must, therefore, establish the theoretical basis for including the variable in this context and subsequently ensure that the data do encapsulate such an effect.

From the perspective of the literature there are two central arguments that attempt to explain why larger firms pay more. First, larger firms tend to hire more qualified and skilled workers as complements to their more capital intensive operations (Hamermesh, 1980). However, differences in human capital attributes are often fully captured within most datasets used to estimate the pay premium. For instance, the Central Statistic Office's National Employment Survey (NES) data, which have been used extensively to measure the pay gap in Ireland over the last number of years, specifically captures information on educational attainment, skill competencies, training and employment tenure. When such differences are explicitly incorporated within a public-private sector wage regression, there is no justification for including a firm-size control variable to account for human capital effects. Consequently, the Hamermesh argument for the inclusion of an organisational size variable in a wage regression model is really only relevant in the context of datasets with limited information on the education and skill profile of workers.

The second prominent explanation for higher wages in larger firms relates to the efficiency wage theory, which states that monitoring costs are higher in larger organisations and consequently large firms pay more in order to discourage shirking (Eaton and While, 1983; Shapiro and Stiglitz, 1984). In this context, the organisational size variable should reflect each organisation's monitoring costs. However, potential monitoring costs are not always effectively reflected in the organisation size variable captured in datasets used to estimate the public-private sector wage gap. For example, in the case of the NES datasets the organisational size measure for public sector employees captures the size of the 'Government Department' an employee belongs to rather than the size of the esablishment (e.g., school, Garda station, hospital) in which they individual works. For instance, in the 2006 NES data, the organisational size measure for each employee in the primary school sector was 34,084; 17,168 for workers in the secondary school sector; and 12,954 for Garda. Thus, inclusion of an organisational size measure in a public-private sector wage equation that is based on NES data, or any dataset that captures the size of the enterprise that a public sector worker is a member of as opposed to their establishment, will greatly exaggerate the pay element associated with monitoring costs, leading to a baised estimate. Thus, the inclusion of organisation control variable needs to be based on a theoretical motivation that is adequately captured in the data at hand.

Inclusion of a Trade Union Membership Variable

In addition to concerns existing around the inclusion of an organisational size control variable in a public-private sector wage equation, doubt also surrounds the inclusion of a trade-union membership variable. The main issue with this control relates to the fact that trade-union membership in the public sector is often a consequence of public sector employment and, is therefore, highly collinear.[1] Furthermore, trade-union membership is generally included in wage equations to reflect the impact of local union level bargaining on wages. Therefore, the trade-union control should only be included in the model if it genuinely meausures differences in the bargaining power of workers across the public and private sectors that will be reflected in earnings. However, it is not clear that this bargaining effect operates in a parallel fashion across the public and private sectors in Ireland. In fact, since 1987 wages in the public sector have been set primarily through the national wage agreement and are therefore largely independent of trade-union membership: even since the collapse of social partnership, public sector wages have been centrally determined by the Government. Therefore, as was the case with the orgnaisational size control variable, trade-union membership should only be included if it legitimately reflects a genuine wage determining factor in the context of the populations of employees being examined.

The Weighting Decision

The decision on whether or not to weight the data used to estimate the public-private sector pay gap can heavily influence the size of the estimated pay gap between both groups of workers. Fazio *et al.* (2006), Gelman (2007) and Winship and Radbill (1994) argue that it is sufficient to estimate un-weighted regressions provided that models include variables relevant to the weighting strategy as additional independent variables. This is a perfectly legitimate argument under normal circumstances where the impact to be estimated relates specifically to the population that the sampling strategy used to collect the data attempts to replicate. However, this is not always the case with the datasets used to estimate the public-private sector pay gap. For example, with the NES data the sampling stratification is designed to generate a data representation of the distribution of firms within the economy and not the distribution of employees. Therefore, an un-weighted regression will generate an estimate of the difference in pay between a worker in a representative private sector firm and his/her counterpart in a representative public sector organisation. However,as workers are not randomly distributed across firms and sectors, the un-weighted estimate will not relate to the difference in pay between representative private and public sector workers. The key conversion from a representative sample of firms to a representative sample of workers requires the data to be transformed in a manner not

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[1] Kelly *et al* (2009) report that trade union membership within the public sector was just below 80 per cent compared to 30 per cent in the private sector.

consistent with the initial survey design, which implies that the use of un-weighted data is not an appropriate option in such circumstances. While the weighting decision can be relatively trivial in the context of datasets that are fully representative of the distribution of employment (such as labour force surveys), it becomes much more fundamental when datasets structured around the distribution of firms or households are used.

Estimation Approaches

The use of estimation approaches that measure the earnings differential at the average, such as Ordinary Least Squares (OLS), while highly informative, provides only a partial picture. A positive public-private wage differential can be driven by higher average wages among both high and low skilled public sector workers or, alternatively, pay premiums that are specific to one particular skill grouping . An understanding of the distributional nature of any public-private sector pay differential is necessary if policy is to be properly informed. Consequently, estimation approaches that measure the average public-private sector pay premium, such as OLS and various decomposition methods, should be augmented by methodologies, such as quantile regression, that also reveal distriutional patterns.

Summary and Conclusions

This submission draws on the ESRI's research on estimating the public-private sector pay differential in Ireland. We would advise that any future studies of public and private sector pay in Ireland strive to generate a single reliable estimate of the public-private sector pay premium. This estimate should be based on an methodology that is consistent with the data at hand, economic theory and existing bargaining arrangements.

References:

Boyle, G., McElligot, R., and O'Leary, J. (2004). "Public-private wage differentials in Ireland, 1994-2001." *ESRI Quarterly Economic Commentary*, Special Article. Summer 2004. Dublin: The Economic and Social Research Institute.

Central Statistics Office. (2009). *National Employment Survey 2007 supplementary analysis.* Cork: CSO.

Central Statistics Office. (2012). *National Employment Survey 2009 and 2010 supplementary analysis.* Cork: CSO.

Eaton, B.C. and White, W.D. (1983). "The economy of high wages: An agency problem", Economica, 50 (198): 175-81.

Ernst & Young and Murphy. (2007). "An econometric study of earnings based on National Employment Survey 2003 data".

Fazio, G., Lam, K. H. and Ritchie, F. (2006) "Sample bias in microeconometric analyses of official microdata." Office for National Statistics, UK, URN 06/737.
http://www.berr.gov.uk/files/file21911.pdf

Foley, P. and O'Callaghan, F. (2010) "Investigating the Public-Private Wage Gap in Ireland Using Data from the National Employment Survey 2007", Journal of the Statistical and Social Inquiry Society of Ireland, XXXIX (2009/2010): 23-52.

Gelman, A. (2007). "Struggles with Survey Weighting and Regression Modeling." *Statistical Science*, 22(2): 153–64.

Hamermesh, D.S. (1980). "Commentary", in Siegfried, J. (Ed.), The Economics of Firm-size, Market Structure, and Social Performance, Federal Trade Commission, Washington, DC.

Kelly, E., McGuinness, S. and O'Connell, P. (2009a). "Benchmarking, social partnership and higher remuneration: Wage setting institutions and the public-private sector wage gap in Ireland", *The Economic and Social Review*, 40(3): 339-370.

Kelly, E., McGuinness, S. and O'Connell, P. (2009b). "The public-private sector pay gap in Ireland: What lies beneath?" ESRI Working Paper No. 321.

Shapiro, C. and Stiglitz, J.E. (1984). "Equilibrium unemployment as a worker discipline device", American Economic Review, 74 (3): 433-44.

Winship, C. and Radbill, L. (1994). "Sampling weights and regression analysis", *Sociological Methods and Research*, 23(2): 230-257.