An Phríomh-Oifig Staidrimh
Central Statistics Office

# CSO Research Paper

# Specific Analysis of the Public/Private Sector Pay Differential for National Employment Survey 2009 & 2010 Data

**Section I**: Exclusion of Work Experience as an explanatory variable
**Section II**: Pension Levy Deducted from Public Sector Pay

**Authors:**

**Kevin McCormack**, Senior Statistician, Central Statistics Office, Cork

**Dr. Mary Smyth**, Statistician, Central Statistics Office, Cork

## Introduction

This analysis has been prepared in response to requests from a range of users of Earnings Statistics. The paper examines two separate areas of analysis in relation to the public/private sector pay differential. The work is based on the Central Statistics Office's (CSO) National Employment Survey (NES) 2009 and 2010 data. Analysis estimating the pay differential focuses on:

Section I: The exclusion of work experience as an explanatory variable
Section II: Pension levy deducted from public sector pay

The 'National Employment Survey 2009 and 2010 Supplementary Analysis' publication[1] was published in October 2012. Following on from this publication, additional analysis was carried out on the two specific areas of analysis listed above. Therefore this paper focuses only on these areas of analysis. The results are presented for 2009 and 2010.

As with similar publications[2,3] the statistical analysis takes into account the differences in characteristics of employees in both sectors. The attributes of the employees (e.g. educational attainment, experience, hours worked, etc.) and the characteristics of their employer (e.g. size of organisation) were used to further explore the wage differential between the two sectors. This analysis does not compare similar jobs between the public and private sectors. For example, An Garda Síochána and Defence Forces personnel are found exclusively within the public sector, while persons engaged in the Accommodation and Food Services and Industry & Construction are found exclusively in the private sector.

A range of different results can be derived depending on the methodology or model specification used to estimate pay differentials[1]. The models used in these analyses are: Ordinary Least Squares Regression (OLS); and Quantile/Percentile Regression. For each of these models, a range of specifications are also presented: weighted; un-weighted; size of enterprise as a wage determining characteristic included and; size of enterprise excluded. The result of all these analyses is a range of public/private sector pay differentials.

The full range of estimates of the public/private sector pay differential for all employees, and separately for males and females, are presented in this paper. This allows for comparability with previous publications[2,3]. The trend in all the estimates is a reduction in the pay-gap over the period 2009/10. Results are presented for Commercial Semi-State organisations included in the public sector and separately for Commercial Semi-State organisations included with the private sector. The reason for this is because the Commercial Semi-State organisations do not pay the pension levy as they are not strictly part of the public sector.

The public sector pension levy was introduced on 1st March 2009. The rates were adjusted to reduce the proportion of the levy on low earners on 1st May 2009. Therefore the pension levy covers 9 months of annual pay in 2009 (2 months pay on the initial rate and 7 months pay on the finalised rate). However the pension levy covers full annual pay from the year 2010 onwards.

Data for 2009 were collected directly as part of the NES 2009 survey. Data for 2010 were derived by updating the 2009 NES with changes to individual net incomes sourced from the Revenue Commissioners[4]. While this approach incorporated changes to income, the hours worked are unchanged between 2009 and 2010 (see Background Notes).

[1] CSO (2012), National Employment Survey 2009 and 2010 Supplementary Analysis
[2] Foley, P. & F. O'Callaghan (2009), "Investigating the Public-Private Wage Gap in Ireland using Data from the National Employment Survey", *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXXIX, pp 23-52.
[3] Kelly, E., S. McGuiness and P. O'Connell (2009), "The Public-Private Sector Pay Gap in Ireland: What lies Beneath?", *ESRI Working Papers*, No. 321. Dublin, Ireland: The Economic and Social Research Institute.
[4] McCormack, K. & Smyth,M. (2015), "The First CSO Earnings Survey constructed from Administrative Data", *Pending*

## Section I: Excluding Experience as an Explanatory Variable - Quantitative Analysis

### I(i) Quantile Regression Results

**Quantile Regression Results 2009**

The quantile regression results presented here are based on a regression model with work experience excluded as an explanatory variable in the analysis of the public sector pay differential. The quantile regression results showed that in general the public sector pay differential was highest for those at the lower end of the earnings distribution. Excluding size of enterprise from the model had the effect of increasing the pay differential. Also, using unweighted data reduced the pay differential, with a few exceptions i.e. in 2009 for female weighted data including size, around the middle earners of the distribution (around the 36th to the 60th percentile) and at the 98th and 99th percentiles. **Note: The values at the extreme ends of the earnings distribution should be treated with caution as some values are due to outliers associated with misclassifications of variables (particularly the first 3% of earners).**

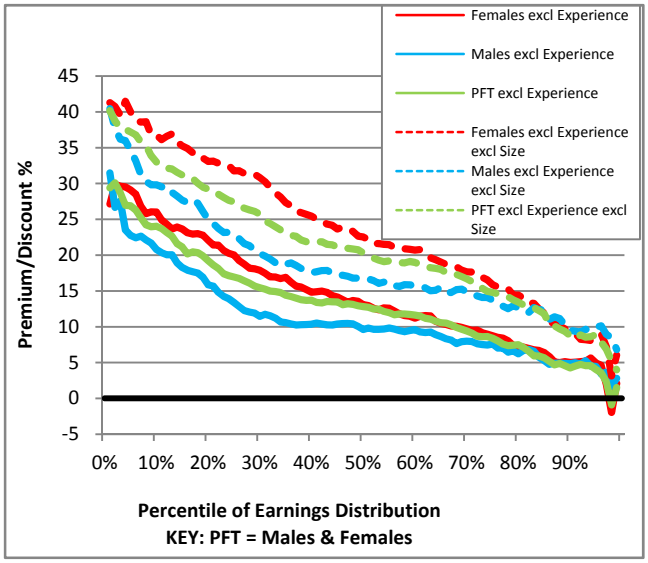
The 2009 quantile regression results presented in Charts 1.1 and 1.2 are based on the model with work experience excluded as an explanatory variable.

The 2009 quantile results in Chart 1.1 for weighted data and *including* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay premium was 24%. At the 98th percentile the pay differential became a discount of –0.9% (i.e. private sector earnings were higher). There was a pay premium of 1.5% at the 99th percentile.

- In 2009 for males the pay differential also decreased from 20.8% at the 10th percentile to 2.8% at the 99th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution (except the 1st, 93rd, 97th to 99th percentile). The pay differential for females became a discount of -1.9% at the 98th percentile and became a premium of 2.1% at the 99th percentile.

**Chart 1.1: Public Sector pay differential (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (weighted) 2009**




The 2009 quantile results in Chart 1.1 for weighted data and *excluding* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay premium was 33%. At the 99th percentile the pay premium was 4%.

- In 2009 for males the pay differential also decreased from 29.8% at the 10th percentile to 6.8% at the 99th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution up to the 84th percentile. From the 85th to the 99th percentile the pay differential was lower for females. The pay premium for females was 6% at the 99th percentile.

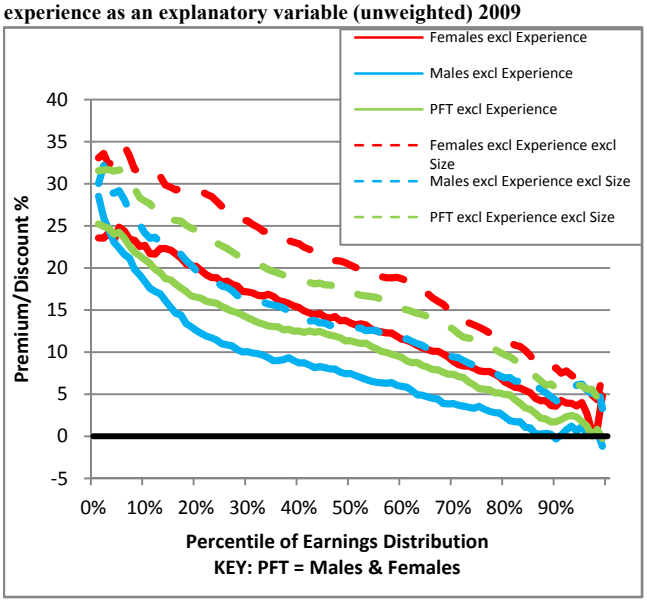
The 2009 quantile results in Chart 1.2 for unweighted data and *including* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased (except for the 91st to 94th percentile) in 2009. At the 10th percentile of earnings the pay premium was 21%. There was a pay premium of 1.7% at the 90th percentile.

- In 2009 for males the pay differential also decreased from 18.4% at the 10th percentile to a discount of -0.3% at the 90th percentile; increasing to a small premium at the 91st percentile and then became a discount of -1.2% at the 99th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution (except the first three percentiles).

- The pay differential for females was 22.7% at the 10th percentile and 3.6% at the 90th percentile.

**Chart 1.2: Public Sector pay differential (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (unweighted) 2009**




The 2009 quantile results in Chart 1.2 for unweighted data and *excluding* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed generally a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay premium was 27.9%. At the 90th percentile the pay premium was 5.8%.

- In 2009 for males the pay differential also decreased from 24.1% at the 10th percentile to 4.2% at the 90th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution except the 97th and 98th percentile where the pay differential was lower for females. The pay premium for females was 31.5% at the 10th percentile and 8.1% at the 90th percentile.

**Quantile Regression Results 2010**

The 2010 quantile regression results with work experience excluded as an explanatory variable, showed that in general there was a greater reduction in the public sector pay differential than in 2009, as the public sector pay cuts were introduced on January 1st, 2010[5]. The 2009 quantile regression results presented in Charts 1.3 and 1.4 are based on the model with work experience excluded as an explanatory variable. **Note: The values at the extreme ends of the earnings distribution should be treated with caution as they are due to outliers associated with misclassifications of variables (particularly the first 3% of earners).**

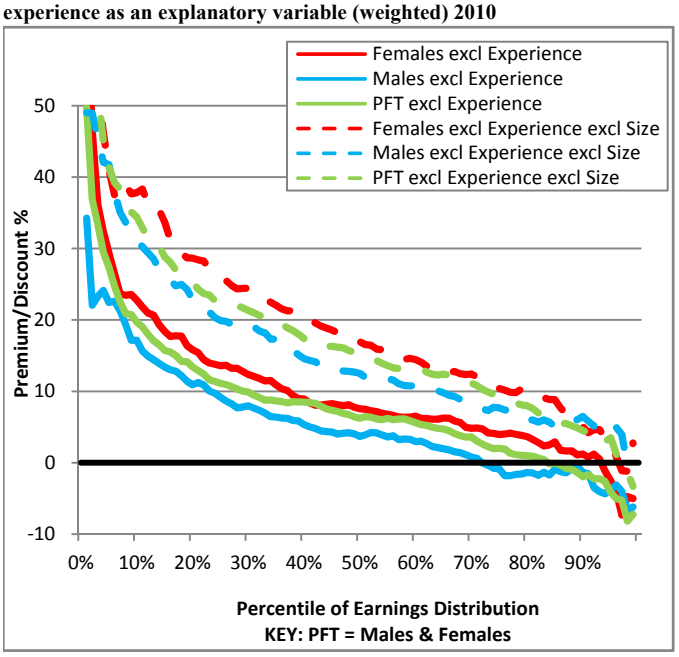
The 2010 quantile regression results presented in Charts 1.3 and 1.4 is based on the model with work experience excluded as an explanatory variable.

The 2010 quantile results in Chart 1.3 for weighted data and *including* size in the model are discussed here.

- For males and females combined, the pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 19.7%. At the 84th percentile the pay differential became a discount of -0.2% (i.e. private sector earnings were higher). The discount was -7.2% at the 99th percentile.

- In 2010 for males the pay differential also decreased from 17.2% at the 10th percentile to a discount of -0.1% at the 72nd percentile, decreasing to a discount of -6.2% at the 99th percentile. The public sector pay differential was higher for females at each of the percentiles across the earnings distribution (except the 96th and 97th percentile). The pay differential for females was 22.8% at the 10th percentile and became a discount of -1.2% at the 94th percentile, decreasing to a discount of -5% at the 99th percentile.

**Chart 1.3: Public Sector pay differential (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (weighted) 2010**




The 2010 quantile results in Chart 1.3 for weighted data and *excluding* size in the model are discussed here.

- For males and females combined, the pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 34.4%. At the 97th percentile the pay differential became a discount of -0.3%.

- In 2010 for males the pay differential also decreased from 31.2% at the 10th percentile to -0.4% discount at the 98th percentile. The public sector pay differential was higher for females at each of the percentiles across the earnings distribution up to the 89th percentile. From the 90th to the 98th percentile the public sector pay differential was higher for males. The pay differential for females was 37.8% at the 10th percentile and became a discount of -1.1% at the 97th percentile, returning to a premium of 2.8% at the 99th percentile.

[5] Budget 2010

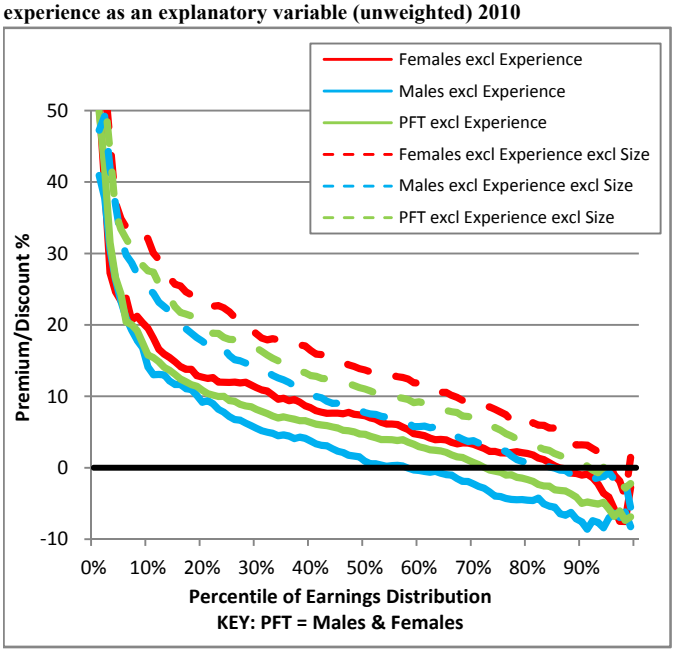
The 2010 quantile results in Chart 1.4 for unweighted data and *including* size in the model are discussed here.

- For males and females combined, the pay differential showed a general decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 15.8%. At the 73rd percentile the pay differential became a discount of -0.3% (i.e. private sector earnings were higher). The discount was -6.9% at the 99th percentile.

- In 2010 for males the pay differential also decreased from 14.1% at the 10th percentile to a discount of -0.1% at the 58th percentile, decreasing to a discount of -8.2% at the 99th percentile.

- The pay differential for females was 19.5% at the 10th percentile and became a discount of -0.2% at the 87th percentile, decreasing to a discount of -2.7% at the 99th percentile.

**Chart 1.4: Public Sector pay differential (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (unweighted) 2010**




The 2010 quantile results in Chart 1.4 for unweighted data and *excluding* size in the model are discussed here.

- For males and females combined, the pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 27.6%. At the 92nd percentile the pay differential became a discount of -0.3%.

- In 2010 for males the pay differential also decreased from 25.1% at the 10th percentile to -0.1% discount at the 85th percentile.

- The pay differential for females was 32% at the 10th percentile and became a discount of -1% at the 96th percentile, returning to a premium of 1.4% at the 99th percentile.

## I(ii) Ordinary Least Squares Regression (OLS)

The OLS results in Table 1.1 present the estimated public sector pay differential with experience excluded as an explanatory variable from the model. The results showed that the public sector pay differential differed for males and females, with males receiving a smaller premium than females in all of the instances modeled. The use of weighted data rather than unweighted data had the effect of increasing the estimated public sector pay differential (with one exception). Also if size of organisation is excluded as an explanatory variable then it had the effect of increasing the estimated public sector pay differential.

**Table 1.1: OLS estimates of the Public Sector pay differential – Weekly earnings for permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable 2009-10**

| Year | Weight | | | | No Weight | | | |
|---|---|---|---|---|---|---|---|---|
| | Size | | No Size | | Size | | No Size | |
| | Premium | t-value | Premium | t-value | Premium | t-value | Premium | t-value |
| | Total | | | | | | | |
| 2009 | 13.5% | 24.03 | 21.7% | 39.53 | 12.4% | 21.55 | 18.8% | 33.54 |
| 2010 | 9.7% | 13.09 | 19.1% | 26.58 | 7.4% | 8.62 | 14.5% | 20.35 |
| | Males | | | | | | | |
| 2009 | 12.4% | 14.96 | 20.2% | 25.09 | 9.8% | 11.80 | 15.8% | 19.61 |
| 2010 | 7.0% | 6.58 | 17.1% | 16.59 | 5.1% | 4.89 | 12.2% | 12.13 |
| | Females | | | | | | | |
| 2009 | 14.2% | 18.59 | 23.5% | 31.44 | 14.6% | 18.90 | 22.0% | 28.90 |
| 2010 | 12.9% | 12.50 | 22.0% | 21.96 | 10.1% | 9.85 | 17.5% | 17.54 |

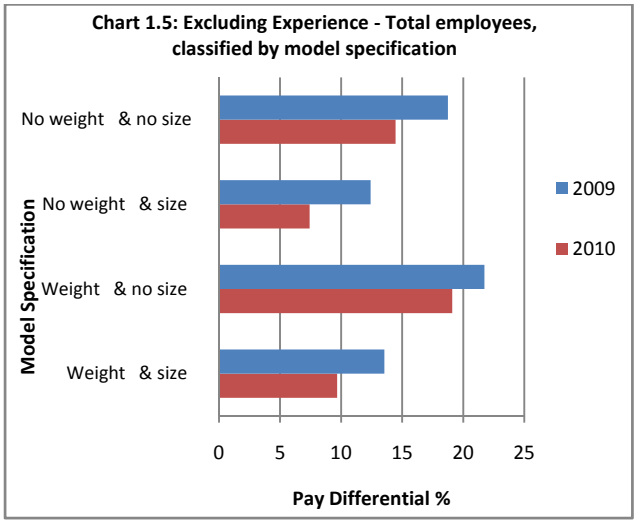
The reduction in the pay differential over the period 2009/10 for all employees ranged from 2.6% to 5%. The reduction was less for females than for males; for males the reduction from 2009/2010 ranged from 3.1% to 5.4%; for females the reduction ranged from 1.2% to 4.6%.

The use of unweighted data had the effect of reducing the pay differential. The exception to this was for female employees in 2009 when size of enterprise is used as an explanatory variable. In this case the weighted data showed a smaller premium (14.2%) than the unweighted data (14.6 %).

OLS regression results, excluding experience as an explanatory variable from the model in Table 1.1 are discussed here. Charts 1.5 to 1.7 show OLS estimates of the public sector pay differential for weekly earnings for permanent full-time employees aged 25-59 years, excluding experience as an explanatory variable for the NES 2009-10 data.

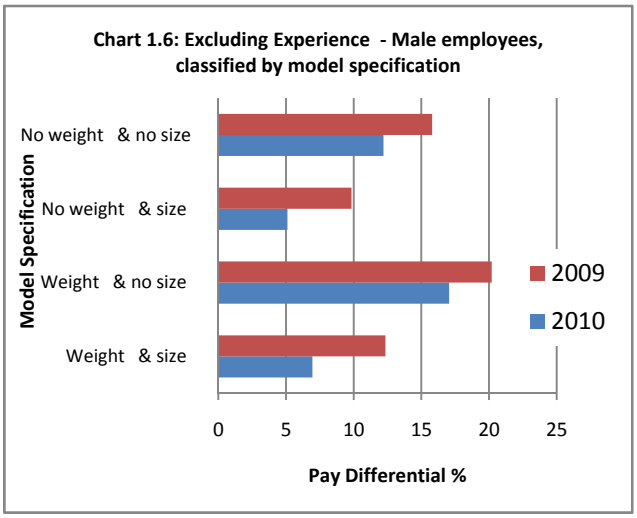
For all employees working in the public sector the model specifications showed the following OLS regression results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 13.5% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 21.7% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of 9.7%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 19.1% in 2010.



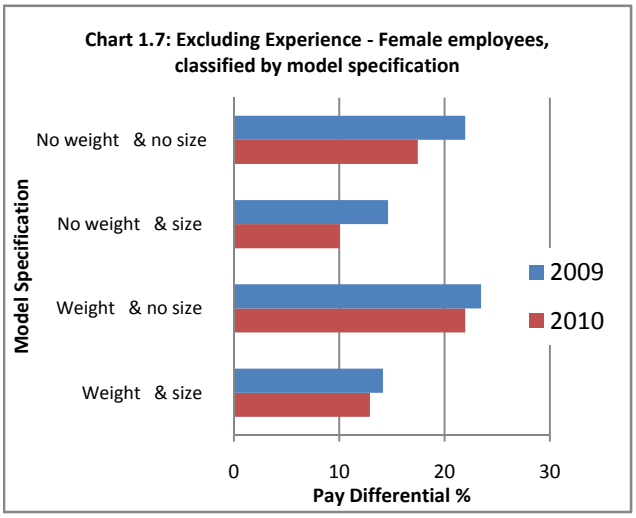

For all males working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 12.4% in 2009.
- Weighted results with size of enterprise *excluded,* showed an average pay premium of 20.2% in 2009.
- In 2010 weighted results with size of enterprise included showed an average pay premium of 7%.
- In 2010 weighted results with size of enterprise *excluded* showed an average pay premium of 17.1%.




For all females working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 14.2% in 2009.
- Weighted results with size of enterprise *excluded,* showed an average pay premium of 23.5% in 2009.
- In 2010 weighted results with size of enterprise included showed an average pay premium of 12.9%.
- In 2010 weighted results with size of enterprise *excluded* showed an average pay premium of 22%.



## Commercial Semi-State Organisations
## OLS Estimates – Excluding Experience as an Explanatory Variable

When Commercial Semi-State organisations are categorized in the private sector the OLS results in Table 1.2 showed the estimated public sector pay differential with experience excluded as an explanatory variable from the model. The results showed that the public sector pay differential differed for males and females, with males receiving a smaller premium than females in all of the instances modeled. The use of weighted data rather than unweighted data had the effect of increasing the estimated public sector pay differential (with one exception). Also if size of organisation is excluded as an explanatory variable then it had the effect of increasing the estimated public sector pay differential.

**Table 1.2: Commercial Semi-State Organisations categorised with the Private Sector 2009-10. OLS estimates of the Public Sector pay differential – Weekly earnings for permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable.**

| Year | Weight | | | | No Weight | | | |
|---|---|---|---|---|---|---|---|---|
| | Size | | No Size | | Size | | No Size | |
| | Premium | t-value | Premium | t-value | Premium | t-value | Premium | t-value |
| | Total | | | | | | | |
| 2009 | 11.8% | 21.22 | 19.1% | 34.54 | 11.4% | 19.84 | 17.2% | 30.45 |
| 2010 | 7.4% | 10.05 | 15.5% | 21.61 | 5.8% | 7.92 | 12.2% | 16.97 |
| | Males | | | | | | | |
| 2009 | 11.4% | 13.52 | 18.1% | 21.51 | 9.2% | 10.92 | 14.6% | 17.50 |
| 2010 | 4.9% | 4.62 | 13.3% | 12.51 | 3.5% | 3.30 | 9.7% | 9.41 |
| | Females | | | | | | | |
| 2009 | 11.8% | 15.88 | 20.7% | 28.05 | 13.1% | 17.14 | 20.1% | 26.57 |
| 2010 | 10.3% | 10.26 | 18.9% | 19.26 | 8.4% | 8.30 | 15.4% | 15.56 |

The Commercial Semi-State organisations are categorized in the private sector in Table 1.2 and the OLS regression results, excluding experience as an explanatory variable from the model are discussed below.

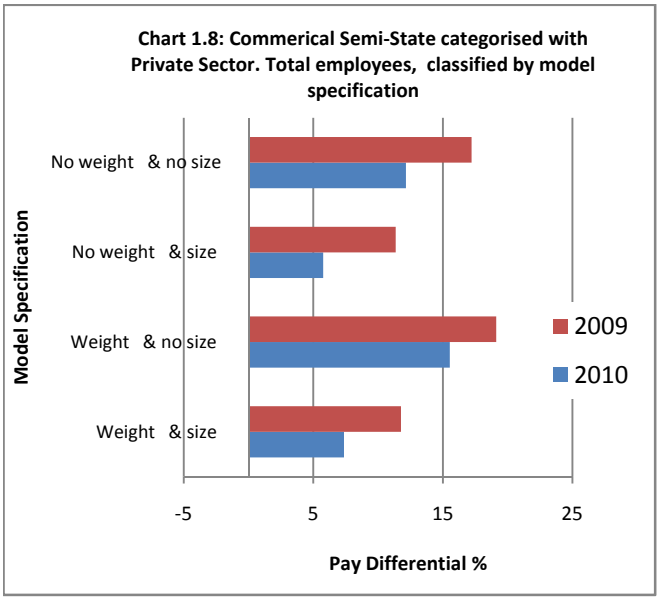
The reduction in the pay differential over the period 2009/10 for all employees ranged from 3.6% to 5.6%. The reduction was less for females than for males; for males the reduction for 2009/2010 ranged from 4.8% to 6.5%; for females the reduction ranged from 1.5% to 4.8%.

The use of unweighted data had the effect of reducing the premium. The exception to this was for female employees in 2009 when size of enterprise is used as an explanatory variable. In this case the weighted data showed a smaller premium (11.8%) than the unweighted data (13.1%).

Charts 1.8 to 1.10 show OLS estimates of the public sector pay differential with commercial semi-state organisations categorised with the private sector. The estimates are for weekly earnings for permanent full-time employees aged 25-59 years, excluding experience as an explanatory variable for the NES 2009-10 data.

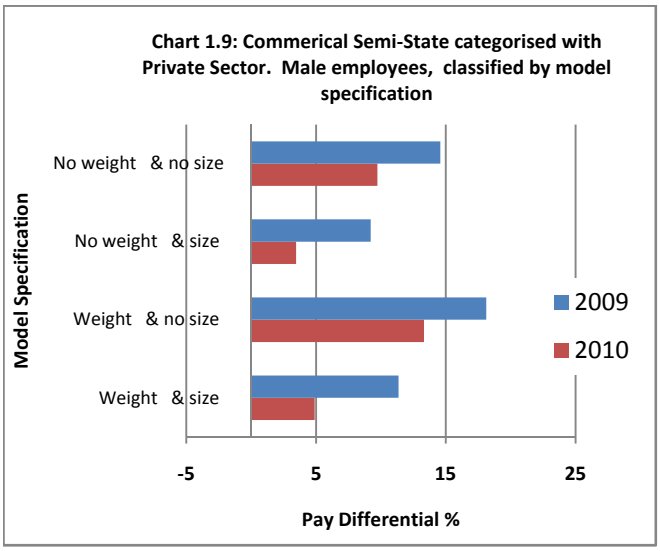
For all employees working in the public sector the model specifications showed the following OLS regression results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 11.8% over those working in the private sector in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 19.1% in 2009.
- In 2010 weighted results with size of enterprise included showed an average pay premium of 7.4%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 15.5% in 2010.



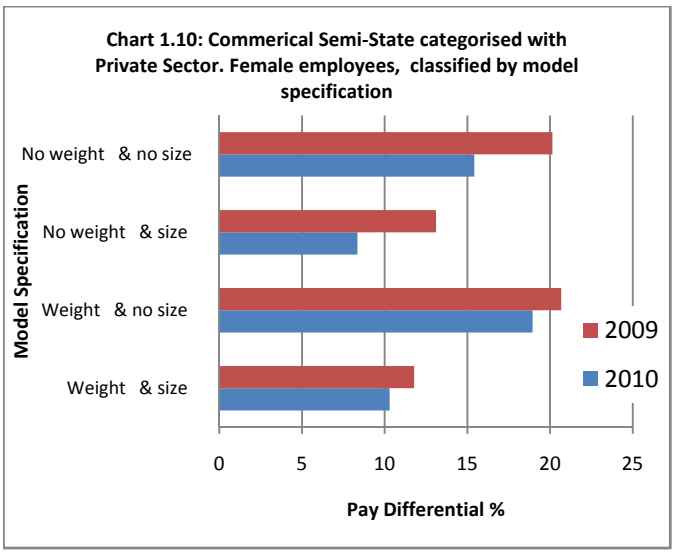

For all males working in the public sector the model specifications showed the following OLS regression results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 11.4% over those working in the private sector in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 18.1% in 2009.
- In 2010 weighted results with size of enterprise included showed an average pay premium of 4.9%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 13.3% in 2010.




For all females working in the public sector the model specifications showed the following OLS regression results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 11.8% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 20.7% in 2009.
- In 2010 weighted results with size of enterprise included showed an average pay premium of 10.3%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 18.9% in 2010.



## Section II – Public Sector Pension Levy Deducted from Gross Pay - Quantitative Analysis

The public sector pension-related deduction (known as the *pension levy*) was introduced with effect from 1st March 2009 via the *Financial Emergency Measures in the Public Interest Act 2009*[6], which was originally enacted by the Oireachtas in February 2009. The rates and bands were adjusted to reduce the proportion of the levy on low earners, effective from 1st May 2009, when the Act was amended in Part 4 of the *Social Welfare and Pensions Act 2009*. Therefore the pension levy covers 9 months of annual pay in 2009 (2 months pay on the initial rate and 7 months pay on the finalised rate). The pension levy covers full annual pay from the year 2010 onwards.

The pension levy rates are given in Figures 2.1 and 2.2 below. The general rate from 2010 onwards is that employees earning up to €15,000 are exempt from the levy. The levy on any excess over €15,000 but not over €20,000 is 5%. The rate for any excess over €20,000 but not over €60,000 is 10% and on earnings amounts over €60,000 the levy is 10.5%.

### 2009 Pension Levy Rates

**Fig. 2.1: Rates for 2009 (introduced in March 2009)**

| Rates for 1st March – 30th April 2009<br>**Amount of Remuneration** | **Rate of deduction** |
|---|---|
| **€** | **%** |
| Up to €2,727.27 | 3 |
| Any excess over €2,727.27 but not over €3,636.36 | 6 |
| Any amount over €3,636.36 | 10 |

| Rates for 1st May to 31st Dec 2009<br>**Amount of Remuneration** | **Rate of deduction** |
|---|---|
| **€** | **%** |
| Up to €12,272.73 | Exempt |
| Any excess over €12,272.73 but not over €16,363.64 | 5 |
| Any excess over €16,363.64 but not over €49,090.91 | 10 |
| Any amount over €49,090.91 | 10.5 |

### 2010 Pension Levy Rates

**Fig. 2.2: Rates for 2010 and each full year thereafter**

| **Amount of Remuneration** | **Rate of deduction** |
|---|---|
| **€** | **%** |
| Up to €15,000 | Exempt |
| Any excess over €15,000 but not over €20,000 | 5 |
| Any excess over €20,000 but not over €60,000 | 10 |
| Any amount over €60,000 | 10.5 |

[6] The purpose of this Act was to introduce a number of financial emergency measures in the public interest.

## II (i) Quantile Regression Results

### Quantile Regression Results 2009

This analysis was based on a regression model with the pension levy deducted from gross earnings. The 2009 quantile regression results in Charts 2.1 and 2.2 showed that the public sector pay differential was highest for those at the lower end of the earnings distribution. In general, excluding size from the model had the effect of increasing the pay differential. Also using unweighted data reduced the differential, with a few exceptions (for females at the 57th and 58th percentile, and at the 98th and 99th percentiles). **Note: The values at the extreme ends of the earnings distribution should be treated with caution as some values are due to outliers associated with misclassifications of variables (particularly the first 3% of earners).**

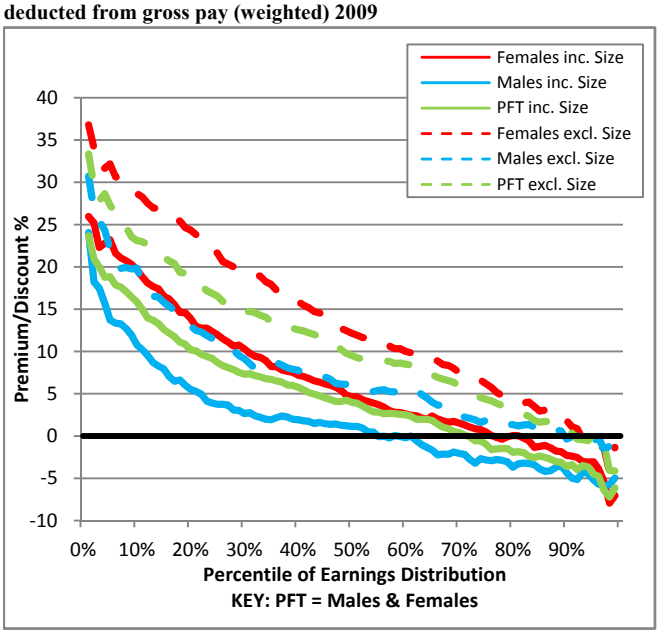
The 2009 quantile regression results presented in Charts 2.1 and 2.2 are based on the model with the pension levy deducted from gross earnings.

The 2009 quantile results in Chart 2.1 for weighted data and *including* size in the model are discussed here.

- For males and females combined, the pay differential showed a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay premium was 15.8%. At the 72nd percentile the pay differential became a discount of -0.1% (i.e. private sector earnings were higher). There was a pay discount of -6.1% at the 99th percentile.

- In 2009 for males the pay differential also decreased, from 10.8% at the 10th percentile to a discount of -5% at the 99th percentile. The public sector pay differential was higher for females at each of the percentiles across the earnings distribution (except the 98th & 99th percentile). The pay differential for females was 19.6% at the 10th percentile and became a discount of -0.2% at the 77th percentile, reducing to a discount of -7% at the 99th percentile.

**Chart 2.1: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (weighted) 2009**




The 2009 quantile results in Chart 2.1 for weighted data and *excluding* size in the model are discussed here.

- For males and females combined, the pay differential showed a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay differential was 33.3% and became a discount of -0.4% at the 92nd percentile. At the 99th percentile the pay differential was -4.1%.

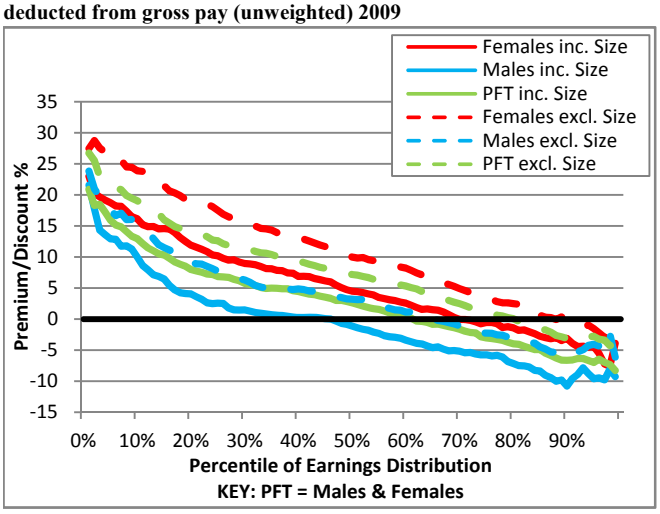
- In 2009 for males the pay differential also decreased from 19.9% at the 10th percentile to a discount of -0.4% at the 90th percentile and was -1.8% at the 99th percentile.

- The public sector pay differential was higher for females at each of the percentiles across the earnings distribution except for a few in the top 10% of earners where the public sector pay differential was higher for males. The pay differential for females was 28.7% at the 10th percentile and became a discount of -0.4% at the 93rd percentile and was -1.4% at the 99th percentile.

The 2009 quantile results in Chart 2.2 for unweighted data and *including* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2009. At the 10th percentile of earnings the pay premium was 13%. There was a discount of -6.6% at the 90th percentile.
- In 2009 for males the pay differential also decreased from 10% at the 10th percentile to a discount of -10.8% at the 90th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution.
- The pay differential for females was 16.1% at the 10th percentile and there was a discount of -3.1% at the 90th percentile.

**Chart 2.2: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (unweighted) 2009**




The 2009 quantile results in Chart 2.2 for unweighted data and *excluding* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a premium of 19.1% at the 10th percentile of earnings in 2009. There was a discount of -3.1% at the 90th percentile.
- In 2009 for males the pay differential also decreased from 15.6% at the 10th percentile to a discount of -5.9% at the 90th percentile. The pay differential was higher for females at each of the percentiles across the earnings distribution.
- The pay differential for females was 23.9% at the 10th percentile and there was a discount of -0.3% at the 90th percentile.

**Quantile Regression Results 2010**

The 2010 quantile regression results with the pension levy deducted from gross pay, showed that in general there was a greater reduction in the public sector pay differential than in 2009. This was due to two factors: (1) the pension levy applied to the full annual earnings in 2010; (2) the public sector pay cuts were introduced on January 1st, 2010. The 2010 quantile regression results presented in Charts 2.3 and 2.4 are based on the model with the pension levy deducted from gross earnings. **Note: The values at the extreme ends of the earnings distribution should be treated with caution as some values are due to outliers associated with misclassifications of variables (particularly the first 3% of earners).**

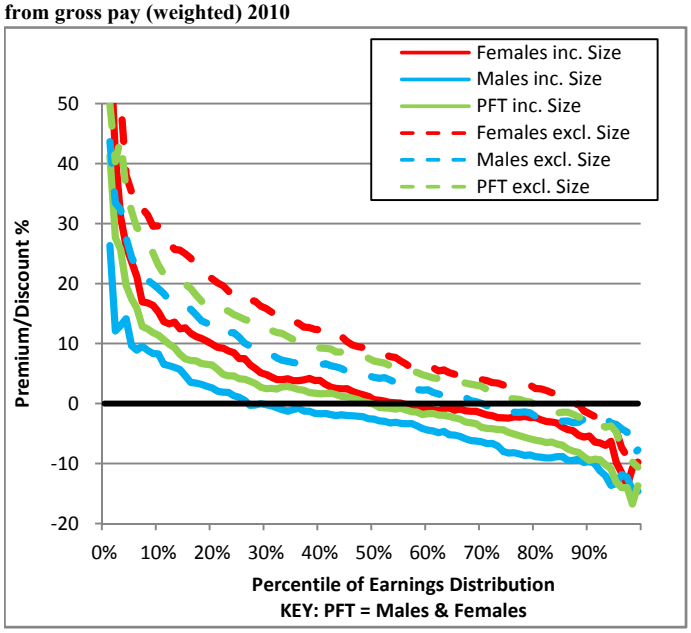
The 2010 quantile results based on the model with the pension levy deducted from gross earnings in Chart 2.3 for weighted data and *including* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 11.4%. At the 50th percentile the pay differential became a discount of -0.1% (i.e. private sector earnings were higher). The discount was -9.5% at the 90th percentile.

- In 2010 for males the pay differential also decreased from 8.3% at the 10th percentile to a discount of -0.3% at the 27th percentile. The discount was -9.6% at the 90th percentile.

- The pay differential for females decreased from 15.2% at the 10th percentile and became a discount of -0.2% at the 56th percentile and was a discount of -5.4% at the 90th percentile.

**Chart 2.3: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (weighted) 2010**




The 2010 quantile results based on the model with the pension levy deducted from gross earnings in Chart 2.3 for weighted data and *excluding* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 23%. At the 80th percentile the pay differential became a discount of -0.2%. There was a discount of -3.1% at the 90th percentile.

- In 2010 for males the pay differential also decreased from 19.1% at the 10th percentile to become a discount of -0.4% at the 71st percentile. At the 90th percentile the discount was -2.4% for males.

- The pay differential for females was 29.6% at the 10th percentile and became a discount of -0.2% at the 87th percentile. The pay premium for males was lower than that for females except for the top 7% of earners, where the discount was generally larger for females.

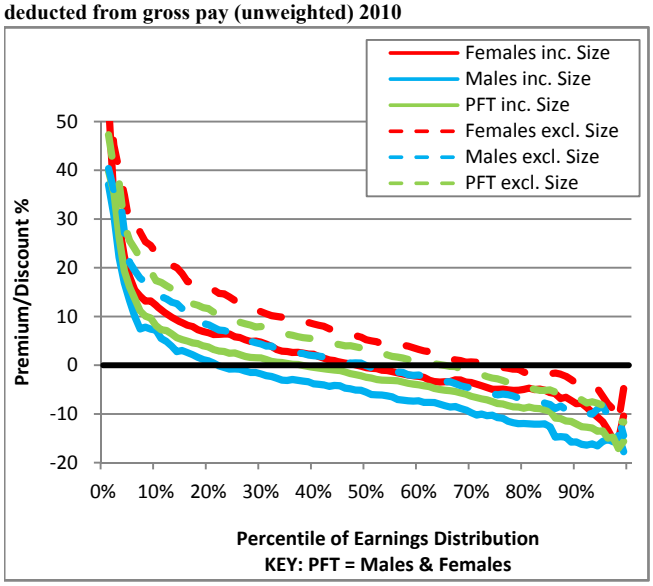
The 2010 quantile results based on the model with the pension levy deducted from gross earnings in Chart 2.4 for unweighted data and *including* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 8.1%. At the 38th percentile the pay differential became a discount of -0.1% (i.e. private sector earnings were higher). This discount was -12.1% at the 90th percentile.

- In 2010 for males the pay differential also decreased from 7.2% at the 10th percentile to a discount of -0.1% at the 22nd percentile.

- The pay differential for females decreased from 12.3% at the 10th percentile and became a discount of -0.2% at the 49th percentile and was a discount of -7.9% at the 90th percentile.

**Chart 2.4: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (unweighted) 2010**




The 2010 quantile results based on the model with the pension levy deducted from gross earnings in Chart 2.4 for unweighted data and *excluding* size in the model are discussed here.

- For males and females combined, the public sector pay differential showed a decreasing trend as earnings increased in 2010. At the 10th percentile of earnings the pay differential was 17.4%. At the 66th percentile the pay differential became a discount of -0.2%. There was a discount of -6.6% at the 90th percentile.

- In 2010 for males the pay differential also decreased from 15% at the 10th percentile to become a discount of -0.5% at the 51st percentile. At the 90th percentile the discount was -9.5% for males.

- The pay differential for females was 23% at the 10th percentile and became a discount of -0.1% at the 75th percentile. At the 90th percentile the discount was -3.7% for females.

**II (ii) Ordinary Least Squares Regression (OLS)**

The OLS results in Table 2.1 show the estimated public sector pay differential, when the pension levy is deducted from gross earnings in the model. The results showed that the public sector pay differential differed for males and females, with females receiving a greater premium than males (males received a discount in some instances) in all of the model specifications. The use of weighted data rather than unweighted data had the effect of increasing the estimated public sector pay differential (with one exception). Also if size of organisation is excluded as an explanatory variable then it had the effect of increasing the estimated public sector pay differential.

**Table 2.1: OLS estimates of the Public Sector pay differential – Weekly earnings for permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay**

| Year | Weight | | | | No Weight | | | |
|---|---|---|---|---|---|---|---|---|
| | Size | | No Size | | Size | | No Size | |
| | Premium | t-value | Premium | t-value | Premium | t-value | Premium | t-value |
| | Total | | | | | | | |
| 2009 | 4.7% | 8.70 | 11.1% | 21.31 | 3.6% | 6.58 | 8.6% | 16.10 |
| 2010 | 1.3% | 1.84 | 9.3% | 19.82 | -1.0% | -1.39 | 5.0% | 7.17 |
| | Males | | | | | | | |
| 2009 | 2.6% | 3.23 | 8.7% | 11.25 | 0.6% | 0.76 | 5.2% | 6.74 |
| 2010 | -2.0% | -1.93 | 6.3% | 6.28 | -3.9% | -3.84 | 2.0% | 2.05 |
| | Females | | | | | | | |
| 2009 | 6.2% | 8.57 | 13.7% | 19.46 | 6.3% | 8.54 | 12.1% | 16.92 |
| 2010 | 5.1% | 4.95 | 12.9% | 13.01 | 2.2% | 2.15 | 8.7% | 8.79 |

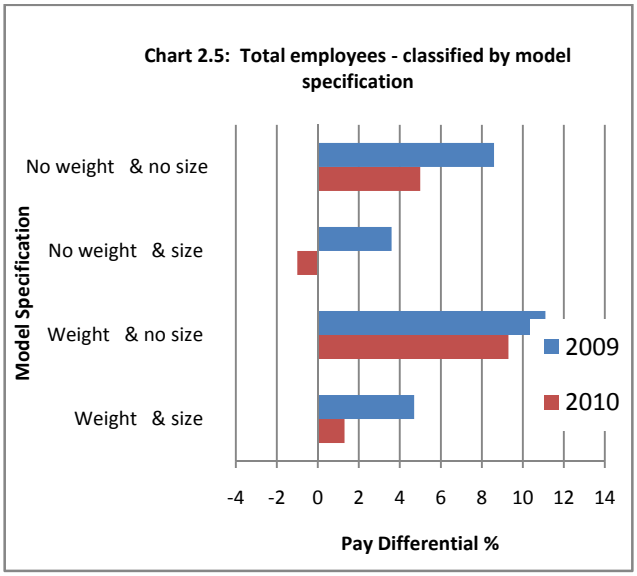
The reduction in the pay differential over the period 2009/10 for all employees ranged from 1.9% to 4.6%. This reduction was less for females than for males; for males the reduction for 2009/2010 ranged from 2.4% to 4.5%; for females the reduction ranged from 0.7% to 4.1%.

The use of unweighted data had the effect of reducing the pay differential. The exception to this was for female employees in 2009 when size of enterprise is used as an explanatory variable. In this case the weighted data showed a slightly smaller premium (6.2%) than the unweighted data (6.3%).

OLS regression results, with the pension levy deducted from gross pay, are discussed below. Charts 2.5 to 2.7 show OLS estimates of the public sector pay differential for weekly earnings for permanent full-time employees aged 25-59 years, with the pension levy deducted from gross pay for the NES 2009-10 data.

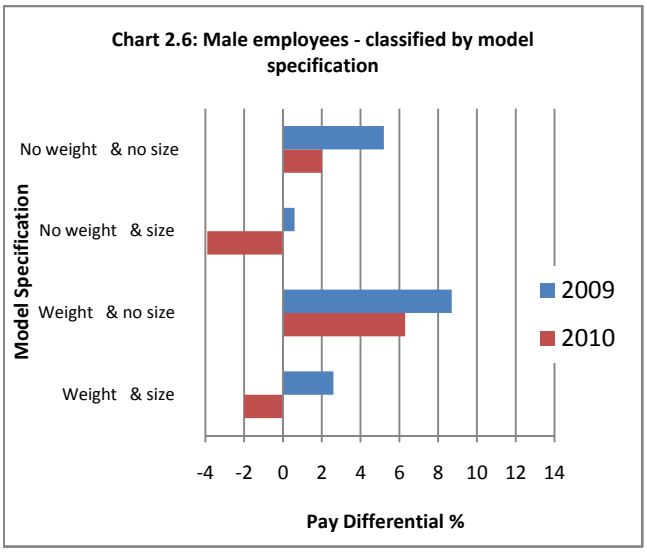
OLS regression results when the pension levy is deducted from gross earnings are presented here. For all employees working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 4.7% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 11.1% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of 1.3% .
- Weighted results with size of enterprise *excluded* showed an average pay premium of 9.3% in 2010.



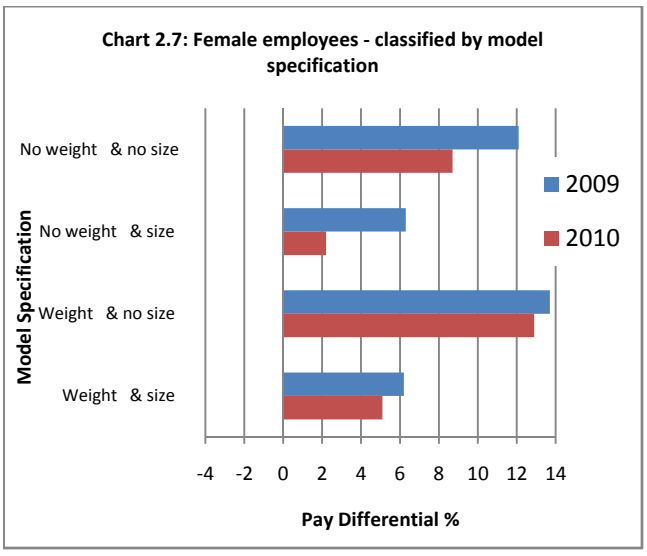

For all males working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 2.6% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 8.7% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of -2%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 6.3% in 2010.




For all females working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 6.2% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 13.7% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of 5.1%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 12.9% in 2010.



## Commercial Semi-State Organisations
## OLS Estimates – Pension Levy Deducted from Gross Pay

The public sector pension levy rates outlined in Figures 2.1 and 2.2 only apply to public sector organisations (e.g. Civil Service, Garda Siochana, etc.). Employees in Commercial Semi-State organisations are not required to pay the pension levy. However the earnings of these commercial organisations are generally included in earnings statistics for the public sector.

When Commercial Semi-State organisations are categorized in the private sector the OLS results in Table 2.2 present the estimated public sector pay differential, with the pension levy deducted from gross earnings. The results showed that the public sector pay differential differed for males and females, with females receiving a greater premium than males (males received a discount in some instances) in all of the model specifications. The use of weighted data rather than unweighted data had the effect of increasing the estimated public sector pay differential (with one exception). Also if size of organisation is excluded as an explanatory variable then it had the effect of increasing the estimated public sector pay differential.

**Table 2.2: Commercial Semi-State organisations categorised with the Private Sector. OLS estimates of the Public Sector pay differential – Weekly earnings for permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay 2009-10**

| Year | Weight | | | | No Weight | | | |
|---|---|---|---|---|---|---|---|---|
| | Size | | No Size | | Size | | No Size | |
| | Premium | t-value | Premium | t-value | Premium | t-value | Premium | t-value |
| | Total | | | | | | | |
| 2009 | 4.9% | 9.17 | 10.5% | 19.90 | 4.0% | 7.27 | 8.4% | 15.58 |
| 2010 | 1.0% | 1.35 | 7.7% | 10.90 | -1.2% | -1.61 | 4.1% | 5.79 |
| | Males | | | | | | | |
| 2009 | 3.9% | 4.84 | 8.8% | 11.01 | 1.7% | 2.12 | 5.6% | 7.02 |
| 2010 | -1.4% | -1.36 | 5.1% | 4.91 | -3.6% | -3.48 | 1.3% | 1.33 |
| | Females | | | | | | | |
| 2009 | 4.9% | 6.94 | 11.9% | 17.24 | 5.6% | 7.64 | 11.1% | 15.52 |
| 2010 | 3.5% | 3.52 | 10.9% | 11.13 | 1.3% | 1.28 | 7.4% | 7.48 |

Semi-State organisations are categorized in the private sector in Table 2.2 and the OLS regression results, with the pension levy deducted from public sector gross earnings in the model, are discussed here.

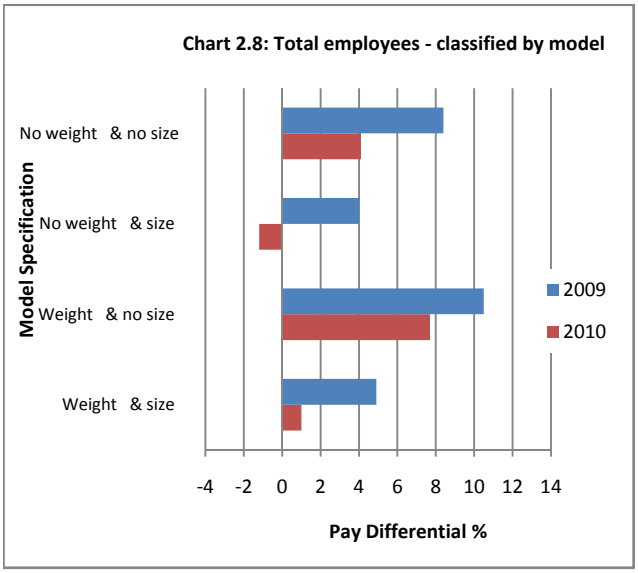
The reduction in the pay differential over the period 2009/10 for all employees ranged from 2.8% to 5.1%. The reduction was less for females than for males; for males the reduction for 2009/2010 ranged from 3.7% to 5.3%; for females the reduction ranged from 1.1% to 4.3%.

The use of unweighted data had the effect of reducing the pay differential. The exception to this is for female employees in 2009 when size of enterprise is used as an explanatory variable. In this case the weighted data showed a smaller premium (4.9%) than the unweighted data (5.6%).

Charts 2.8 to 2.10 with commercial semi-state organisations categorised in the private sector, show
OLS estimates of the public sector pay differential for weekly earnings for permanent full-time employees aged 25-59 years, with the pension levy deducted from gross pay for the NES 2009-10 data.

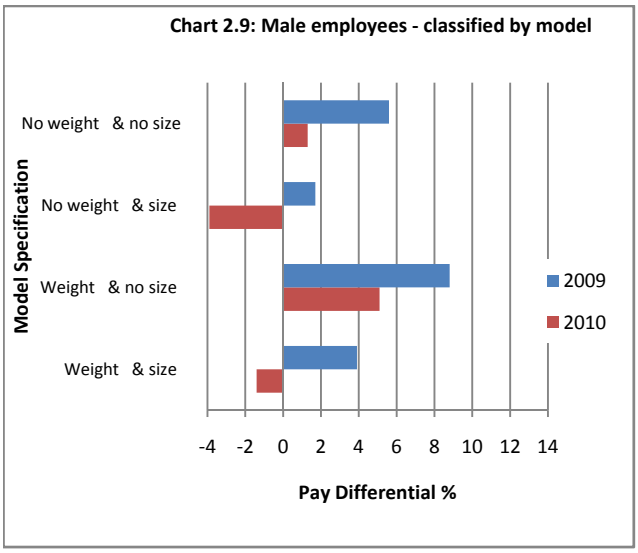
OLS regression results when the pension levy is deducted from gross earnings are presented here. For all employees working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 4.9% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 10.5% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of 1%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 7.7% in 2010.



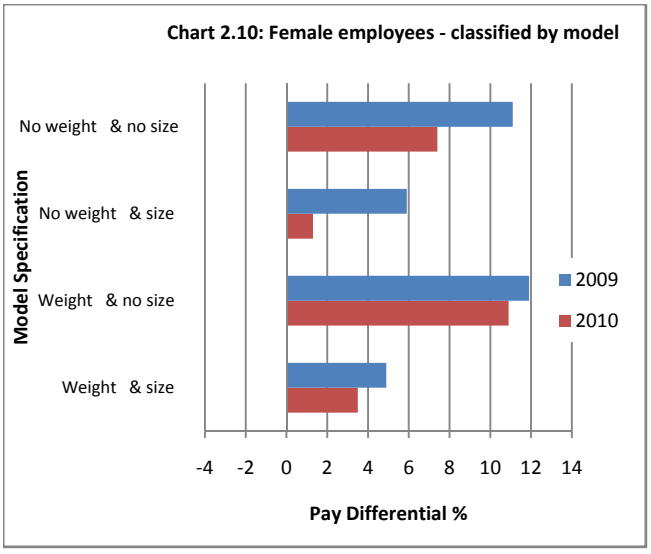

For all males working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 3.9% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 8.8% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed there was a discount -1.4%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 5.1% in 2010.




For all females working in the public sector the model specifications showed the following results:

- Weighted results with size of enterprise *included* as an explanatory variable showed an average pay premium of 4.9% in 2009.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 11.9% in 2009.
- In 2010 the weighted results with size of enterprise *included* showed an average pay premium of 3.5%.
- Weighted results with size of enterprise *excluded* showed an average pay premium of 10.9% in 2010.



## Section III Conclusion

### III (i) Excluding Experience as an Explanatory Variable

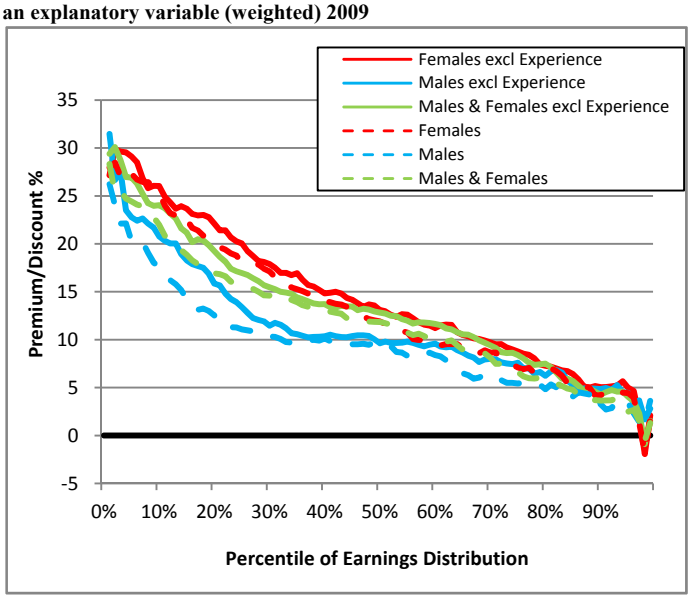
**Quantile Regression Summary**

The quantile regression results showed that in general, excluding experience from the model had the effect of increasing the pay differential (see Chart 3.1). In 2009 the exception to this was the 98th percentile for all employees and female employees, and the 99th percentile for males (weighted data and including size) whereby excluding experience had the effect of reducing the pay differential. In 2010 the two exceptions were for the 92nd and 99th percentile for all employees. There were three exceptions for males in the top 10% of the earnings distribution. For females there were thirteen exceptions; eight in the top 20% of the earnings distribution, four in the middle of the distribution and one at the 23rd percentile (see Chart 3.2).

- For males, excluding experience had the greatest impact on the lowest 25% of earners in 2009. The premium increased by between 2.3% and 5.4% when experience is excluded for the lowest 25% of male earners.
- Excluding experience had the least impact on the middle quarter of male earners (those earning between the 35th and 59th percentile). The premium increased by less than 1% for this group, and also a few earners between the 84th and 89th percentile.

- For females, excluding experience had the least impact for the top 20% of earners in 2009, as the premium was 0.8% or less.
- The premium was highest (2% to 2.6%) for earners around the 20th percentile.

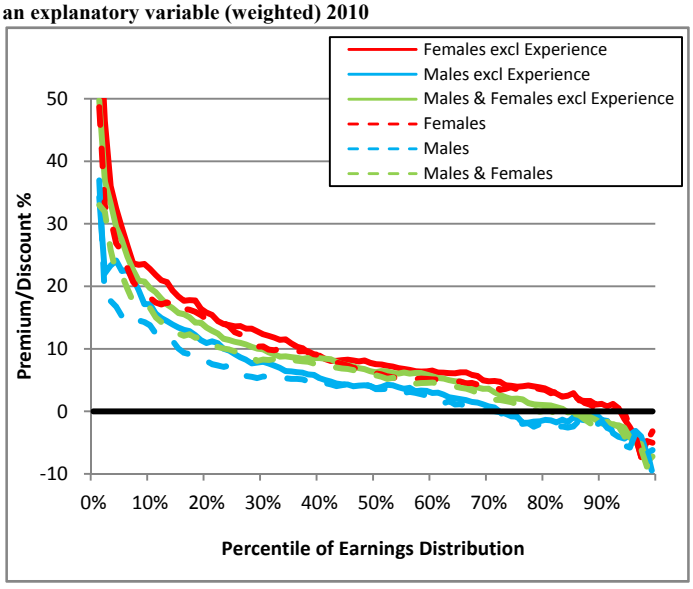
**Chart 3.1: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (weighted) 2009**




- For males, excluding experience had the greatest impact on the lowest 31% of earners in 2010. The premium increased by over 2% when experience is excluded.

- For females, excluding experience had the greatest impact on the lowest 14% of earners in 2010. The premium increased by 2% or more for this group and a few earners around the 29th percentile.

**Chart 3.2: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Excluding experience as an explanatory variable (weighted) 2010**



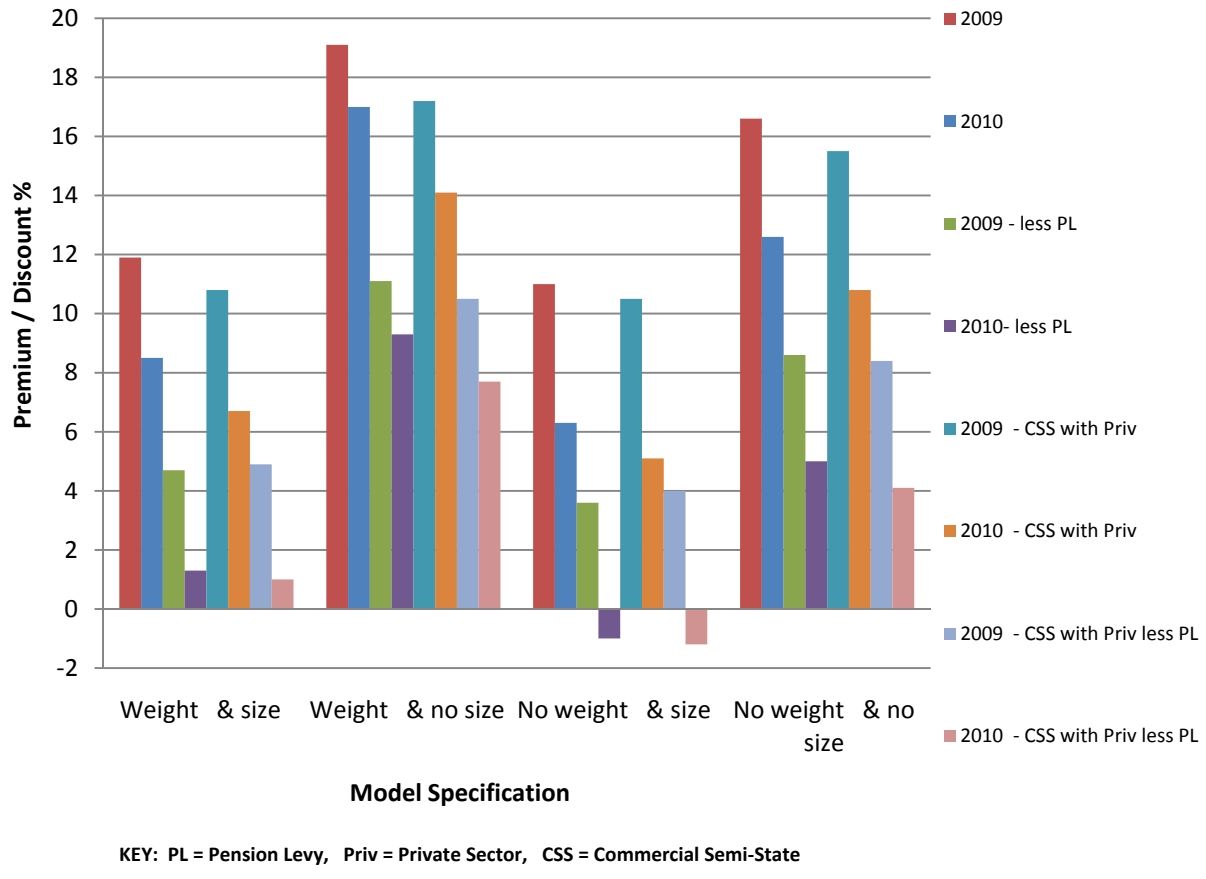
**Ordinary Least Squares Regression (OLS) Summary**

Excluding experience as an explanatory variable had the effect of increasing the public sector pay differential in all OLS model specifications. In 2009 the average public sector pay differential for weighted data (including size) increased from 11.9% to 13.5% when experience as an explanatory variable is excluded in the OLS model specifications. In 2010 the average pay differential increase was from 8.5% to 9.7% when experience is excluded from the model.

The effect of excluding experience as an explanatory variable was greater for males than for females. In 2009 this effect caused the OLS average pay differential for males to increase from 10.4% to 12.4%, and for females it increased from 12.8% to 14.2%. The 2010 average pay differential increased from 5.4% to 7% for males, and from 12% to 12.9% for females.

When the Commercial Semi-State organisations are categorized in the private sector in the OLS regression results, excluding experience as an explanatory variable from the model had the effect of increasing the pay differential. The weighted results showed that when the size of enterprise is *included* as an explanatory variable then for *all* employees in the public sector the premium increased from 10.8% to 11.8% over those working in the private sector in 2009. The pay premium for *all* males working in the public sector was on average 11.4% with a pay premium of 11.8% for *all* females in 2009.

**Chart 3.3: OLS Estimates of the Public Sector pay differential – Weekly earnings for permanent full-time employees aged 25-59 years. NES 2009-10**




**KEY: PL = Pension Levy, Priv = Private Sector, CSS = Commercial Semi-State**

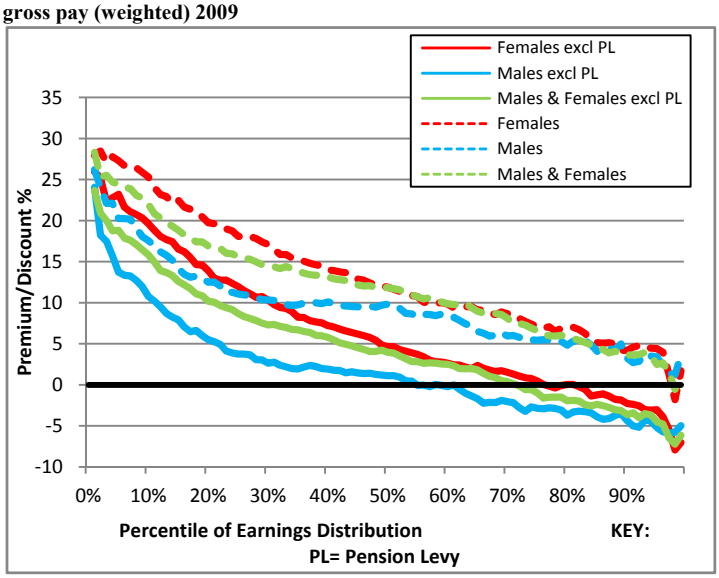
### III (ii) Pension Levy Deducted from Gross Pay

**Quantile Regression Summary**

The quantile regression results showed that deducting the pension levy from gross earnings had the obvious effect of decreasing the pay differential in the model.

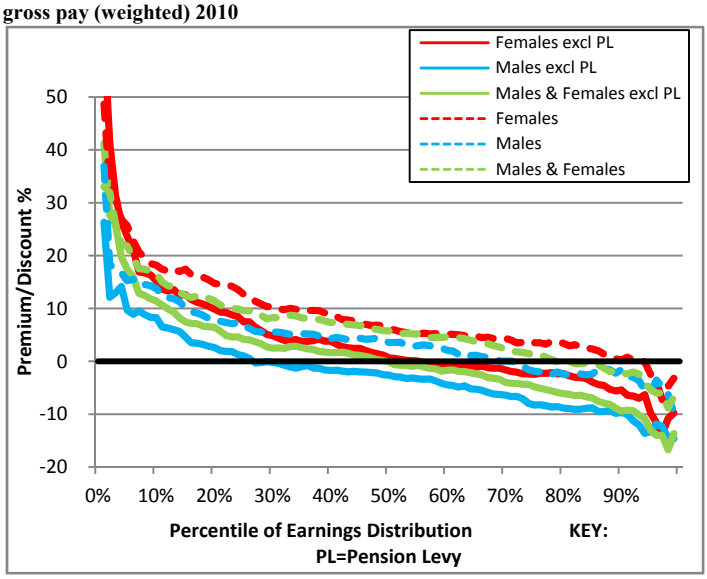
- In 2009 the pay differential became negative at the 98th percentile for the standard weighted results (including size in the model).
- However when the pension levy is deducted the model showed the pay differential in 2009 became negative from the 72nd percentile onwards.

**Chart 3.4: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (weighted) 2009**




- In 2010 the pay differential became negative at the 82nd percentile for the standard weighted results (including size in the model).
- However when the pension levy is deducted the model showed that the pay differential became negative from the 50th percentile onwards in 2010. Also the impact of the public sector pay cuts introduced on January 1st, 2010 is apparent.

**Chart 3.5: Public Sector wage gap (%) distribution - Weekly earnings, permanent full-time employees aged 25-59 years. Pension Levy deducted from gross pay (weighted) 2010**



**Ordinary Least Squares Regression (OLS) Summary**

Chart 3.3 summarises the average OLS results for the public sector pay premium for all employees. The effect of the pension levy on the public sector pay was to reduce the pay premium significantly. The OLS weighted results (including size) in 2009 showed the public sector pay premium of 11.9% reducing to 4.7% when the pension levy is deducted from gross pay. The reduction is more significant in 2010 as the pension levy is applied to the full year and the public sector pay cuts were introduced in 2010; the public sector pay differential in 2010 reduced from 8.5% to 1.3% after the pension levy is applied.

The use of the unweighted data in the model had the effect of reducing the premium. However, more significantly, the inclusion of size of organisation as a determining factor in the OLS model has a greater impact on reducing the pay premium. This is discussed in previous publications on quantitative analysis of NES data[7].

Commercial Semi-State organisations are generally included with the public sector earnings data as they are state owned and benefit from national pay agreements. However, since they are commercial bodies they are not subject to the public sector pension levy. Therefore categorizing the Commercial Semi-State organisations with the private sector showed that the public sector average pay differential was reduced from 11.9% to 10.8% in 2009 (weighted and including size). This reduction was greater in the 2010 results where the public sector average pay differential reduced from 8.5% to 6.7%, as the public sector pay cuts came into effect in 2010 and the pension levy is applied to the full year's earnings. Additionally, if the pension levy is deducted from gross pay the reduction in the public sector pay differential is even greater with values of 4.9% and 1%, respectively, for 2009 and 2010.

[7]Publications based on NES data:
CSO (2009), National Employment Survey 2007 - Supplementary Analysis.
CSO (2012), National Employment Survey 2009 and 2010 Supplementary Analysis.
Foley, P. & F. O'Callaghan (2009), "Investigating the Public-Private Wage Gap in Ireland using Data from the National Employment Survey", *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXXIX, pp 23-52.
Kelly, E., S. McGuiness and P. O'Connell (2009), "The Public-Private Sector Pay Gap in Ireland: What lies Beneath?", *ESRI Working Papers*, No. 321. Dublin, Ireland: The Economic and Social Research Institute.

## Technical Notes

A number of other technical points should also be noted:

- Data analysis is based on the National Employment Survey (NES) weekly earnings for permanent full-time employees aged 25-59 years.

- Analyses have been done on the basis of weekly 'contracted hours'. However, in a number of instances actual working hours vary from contracted hours. Typically these cases arise in occupations that require employees to be flexible, such as in the educational sector or occupations with shift-work or where 'stand-by' or 'emergency call out' is an integral condition of the job.

- Data for 2009 were collected directly as part of NES 2009. Data for 2010 were derived by updating the 2009 NES with changes to individual net incomes sourced from the Revenue Commissioners. While this approach incorporated changes to income, the hours worked are unchanged between 2009 and 2010. Details of the NES 2010 are discussed in the most recent NES publication[8].

- The NES 2009 survey was used to construct the NES 2010 data by applying Revenue Commissioners income changes to the NES 2009 data. An analysis of employees' net incomes from Revenue Commissioners data was carried out to calculate the percentage change in incomes between 2009 and 2010. This percentage change was then applied to the 2009 NES data to create the NES 2010 data. Therefore the NES 2010 hours worked are unchanged from the 2009 NES data, but the earnings have been adjusted to follow Revenue Commissioners income trends. The standard approach for comparisons is to match the data for employees who work for 10 or more hours per week and work for 50 or more weeks per year. Also, employees whose Revenue Commissioners net income in 2010 were outside a 40% range of their 2009 Revenue Commissioners net income were excluded. This is the criteria under which the NES 2010 data is analysed.

[8] CSO (2012) National Employment Survey 2009 and 2010 Supplementary Analysis

# Appendix - Quantile Regression Results

## Public Sector Pay Differentials

### A.1 Quantile Regression Model: Excluding experience as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (weighted results) 2009**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 26.0 | 20.8 | 24.0 | 36.8 | 29.8 | 33.0 |
| **20%** | 22.1 | 15.9 | 19.2 | 33.1 | 25.0 | 29.2 |
| **30%** | 17.9 | 11.4 | 15.5 | 30.8 | 20.2 | 25.7 |
| **40%** | 14.8 | 10.4 | 13.7 | 25.4 | 17.6 | 21.9 |
| **50%** | 13.1 | 9.6 | 12.8 | 22.5 | 16.8 | 20.3 |
| **60%** | 11.2 | 9.6 | 11.6 | 20.7 | 15.7 | 19.0 |
| **70%** | 9.7 | 8.0 | 9.4 | 17.7 | 14.9 | 16.7 |
| **80%** | 7.3 | 6.2 | 7.5 | 14.4 | 12.6 | 13.4 |
| **90%** | 5.0 | 4.8 | 4.3 | 9.4 | 9.5 | 8.8 |

### A.2 Quantile Regression Model: Excluding experience as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (unweighted results) 2009**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 22.7 | 18.4 | 21.0 | 31.5 | 24.1 | 27.9 |
| **20%** | 20.2 | 12.6 | 16.5 | 29.4 | 19.7 | 24.5 |
| **30%** | 17.2 | 10.0 | 14.1 | 25.6 | 16.3 | 20.9 |
| **40%** | 15.3 | 8.7 | 12.5 | 22.9 | 14.1 | 18.7 |
| **50%** | 13.4 | 7.5 | 11.3 | 20.3 | 12.9 | 17.3 |
| **60%** | 11.5 | 5.9 | 9.4 | 18.7 | 11.5 | 15.1 |
| **70%** | 8.9 | 3.9 | 7.4 | 14.8 | 9.4 | 12.7 |
| **80%** | 6.5 | 2.3 | 5.0 | 11.2 | 7.0 | 9.7 |
| **90%** | 3.6 | -0.3 | 1.7 | 8.1 | 4.2 | 5.8 |

### A.3 Quantile Regression Model: Excluding experience as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (weighted results) 2010**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 22.8 | 17.2 | 19.7 | 37.8 | 31.2 | 34.4 |
| **20%** | 15.8 | 10.9 | 13.4 | 28.6 | 22.8 | 25.2 |
| **30%** | 12.3 | 8.0 | 9.9 | 24.4 | 19.1 | 21.3 |
| **40%** | 8.9 | 5.3 | 8.5 | 20.8 | 14.6 | 17.4 |
| **50%** | 7.6 | 3.7 | 6.2 | 16.9 | 12.5 | 14.9 |
| **60%** | 6.5 | 3.0 | 5.6 | 14.4 | 10.8 | 13.3 |
| **70%** | 4.8 | 0.8 | 3.6 | 12.4 | 8.4 | 11.2 |
| **80%** | 3.7 | -1.4 | 1.0 | 10.0 | 6.1 | 8.0 |
| **90%** | 1.2 | -1.4 | -2.0 | 5.0 | 6.5 | 4.5 |

### A.4 Quantile Regression Model: Excluding experience as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (unweighted results) 2010**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 19.5 | 14.1 | 15.8 | 32.0 | 25.1 | 27.6 |
| **20%** | 12.7 | 9.2 | 10.8 | 23.2 | 17.7 | 20.1 |
| **30%** | 11.2 | 5.5 | 8.1 | 18.8 | 14.1 | 16.8 |
| **40%** | 8.4 | 3.7 | 6.3 | 16.4 | 10.4 | 12.9 |
| **50%** | 7.3 | 0.9 | 4.7 | 13.7 | 7.7 | 11.0 |
| **60%** | 4.6 | -0.4 | 2.9 | 11.8 | 5.8 | 9.2 |
| **70%** | 3.3 | -2.3 | 0.7 | 8.8 | 3.8 | 7.0 |
| **80%** | 2.0 | -4.5 | -1.7 | 5.9 | 0.7 | 3.4 |
| **90%** | -1.0 | -7.6 | -5.0 | 3.2 | -1.1 | 0.8 |

### A.5 Quantile Regression Model: Pension Levy deducted from gross pay as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (weighted results) 2009**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 19.6 | 10.8 | 15.8 | 28.7 | 19.9 | 23.1 |
| **20%** | 13.9 | 5.5 | 10.2 | 24.4 | 13.0 | 18.6 |
| **30%** | 10.3 | 2.7 | 7.3 | 19.9 | 9.2 | 14.6 |
| **40%** | 7.2 | 1.9 | 5.8 | 15.9 | 7.8 | 12.6 |
| **50%** | 4.7 | 1.1 | 4.0 | 12.1 | 5.9 | 9.5 |
| **60%** | 2.6 | -0.2 | 2.5 | 10.0 | 5.2 | 8.5 |
| **70%** | 1.5 | -2.1 | 0.4 | 7.5 | 2.7 | 5.9 |
| **80%** | 0.1 | -3.7 | -1.9 | 4.0 | 1.3 | 3.0 |
| **90%** | -2.3 | -4.3 | -3.6 | 1.8 | -0.4 | 0.9 |

### A.6 Quantile Regression Model: Pension Levy deducted from gross pay as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (unweighted results) 2009**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 16.1 | 10.0 | 13.0 | 23.9 | 15.6 | 19.1 |
| **20%** | 11.9 | 4.0 | 8.0 | 19.1 | 9.1 | 14.3 |
| **30%** | 9.0 | 1.5 | 5.8 | 15.9 | 6.3 | 11.4 |
| **40%** | 6.9 | 0.2 | 4.5 | 13.0 | 4.9 | 9.3 |
| **50%** | 4.5 | -1.1 | 2.6 | 10.0 | 3.2 | 7.2 |
| **60%** | 2.6 | -3.4 | 0.4 | 8.2 | 1.1 | 5.3 |
| **70%** | -0.1 | -5.2 | -1.6 | 4.9 | -1.1 | 2.5 |
| **80%** | -1.4 | -7.2 | -4.0 | 2.5 | -3.0 | 0.1 |
| **90%** | -3.1 | -10.8 | -6.6 | -0.3 | -5.9 | -3.1 |

## A.7 Quantile Regression Model: Pension Levy deducted from gross pay as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (weighted results) 2010**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 15.2 | 8.3 | 11.4 | 29.6 | 19.1 | 23.0 |
| **20%** | 9.9 | 2.6 | 6.4 | 20.8 | 12.5 | 15.8 |
| **30%** | 4.9 | -0.2 | 2.5 | 15.8 | 8.5 | 12.7 |
| **40%** | 3.9 | -1.7 | 1.6 | 12.3 | 6.4 | 9.3 |
| **50%** | 0.6 | -2.6 | -0.1 | 8.8 | 4.4 | 7.1 |
| **60%** | -0.8 | -4.4 | -1.7 | 5.7 | 2.3 | 4.6 |
| **70%** | -1.6 | -6.4 | -4.0 | 4.0 | 0.0 | 2.9 |
| **80%** | -2.3 | -8.8 | -6.1 | 2.5 | -2.2 | -0.2 |
| **90%** | -5.4 | -9.6 | -9.5 | -1.7 | -2.4 | -3.1 |

## A.8 Quantile Regression Model: Pension Levy deducted from gross pay as an explanatory variable

**Permanent Full-Time employees aged 25-59 years (unweighted results) 2010**

| | Including Size | | | Excluding Size | | |
|---|---|---|---|---|---|---|
| **Percentile** | **Females** | **Males** | **Males & Females** | **Females** | **Males** | **Males & Females** |
| **10%** | 12.3 | 7.2 | 8.1 | 23.0 | 15.0 | 17.4 |
| **20%** | 6.6 | 0.9 | 3.7 | 15.9 | 8.3 | 11.6 |
| **30%** | 4.7 | -1.8 | 1.5 | 11.0 | 4.4 | 8.0 |
| **40%** | 2.3 | -3.8 | -0.5 | 8.4 | 2.0 | 5.5 |
| **50%** | -0.5 | -5.5 | -2.5 | 5.2 | 0.0 | 3.5 |
| **60%** | -2.3 | -7.3 | -4.0 | 3.3 | -2.0 | 0.8 |
| **70%** | -3.6 | -9.8 | -6.4 | 0.7 | -4.7 | -1.4 |
| **80%** | -5.0 | -12.0 | -8.9 | -1.4 | -7.3 | -4.6 |
| **90%** | -7.9 | -15.7 | -12.1 | -3.7 | -9.5 | -6.6 |