Standard Report
on
Methods and Quality (v1)
for
\<Job Churn Statistics\>

\<2006-onward\>

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1 Overview

This statistical product explores the flow of jobs and workers between firms and within and between sectors. This database product is derived solely from administrative data sources in other Government Departments using a methodology adapted from research literature in this area (see Appendix for an in-depth methodology).

The comprehensiveness of the resulting analysis dataset, containing attributes on both workers and enterprises, provides for significant new opportunities to inform policy and decision making with respect to the dynamics of the labour market.

2 General Information

2.1 Statistical Category

The analysis dataset used is derived from linking the:

- Business register (CBR)

- Employer tax returns (P35)

- Social Protection records (CRS).

2.2 Area of Activity

Job Churn provides information about those leaving, staying or taking new jobs and the firms in which these jobs are located in the Irish labour market.

2.3 Organisational Unit Responsible, Persons to Contact

Administrative Date Centre

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2.4 Objectives and Purpose; History

Ireland's economy experienced a sharp downturn at the end of 2007. This downturn had a significant impact on employment with the unemployment rate rising from 4.6% in Q3 2007 to 13.9% in Q3 2010.

Any insights that can be obtained about the labour market that can inform decisions are, therefore, of significant value to government, business, workers and work seekers (Fox, 2009)[1].

In particular, survey vehicles such as Labour Force Surveys are limited in their ability to track the flow of workers between firms.

This product exploits administrative data for statistical purposes to allow significant insights into job churn and its components in the Irish jobs markets. In other words, it provides information about those leaving, staying or taking new jobs and the firms in which these jobs are located.

2.5 Periodicity

The Job Churn statistics will be published annually.

2.6 Client

General national requirement as described in section 2.7 below.

2.7 Users

- Irish Government
- Economists
- General Public
- Academics
- Employees
- Job Seekers.

2.8 Legal basis

None.

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[1] Fox, R. (2009, June). *Job Opportunities in the Downturn.* Retrieved March 15, 2011, from http://www.fas.ie/NR/rdonlyres/9ABC5EE1-CF20-4AA5-ACA4-C5B81DD9FE5E/793/jobsdownturn96.pdf

3 Statistical Concepts, Methods

3.1 Subject of the Statistics

The flow of jobs and workers between firms.

3.2 Units of Observation/Collection Units/Units of Presentation

Unit of Observation: Employee records in the Revenue Commissioners' P35 data.

Unit of Presentation:

1. Jobs created, jobs destroyed, hirings, separations
2. Employment records, volume of work (person years), value of work (reckonable pay) and mean weekly reckonable pay.

3.3 Data Sources

Please see section 2.1 above.

3.4 Reporting Unit/Respondents

Not applicable.

3.5 Type of Survey/Process

Not applicable.

3.6 Characteristics of the Sample/Process

3.6.1 Population and Sampling Frame

Paid employee records returned to the Revenue Commissioners by employers in the P35L returns.

The Central Business Register (CBR) is the business register of enterprises maintained by CSO to support the compilation of statistics on business as laid down in EU statistical legislation.

3.6.2 Sampling Design

Not applicable.

3.7 Survey Technique/Data Transfer

Data is transferred electronically using a secure exchange infrastructure.

3.8 Questionnaire (including explanations)

Not applicable.

3.9 Participation in the Survey

Not applicable.

3.10 Characteristics of the Survey/Process and its Results

See the Job Churn background notes[2].

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[2] http://www.cso.ie/en/surveysandmethodology/industry/jobchurn/

3.11 Classifications used

Classification by NACE Rev 2 (sectors B - N excluding K64.20)[3] Activity and by Year, Firm Employment size and status, Sex, Age in Reference, Employee Status, New Employment Indicators, Separations Activity, Previous Activity, Year and Indicator of Wage Increase.

3.12 Regional Breakdown of Results

Not available.

4 Production of the Statistics, Data Processing, Quality Assurance

4.1 Data Capture

The analysis dataset is derived from joining up the employee returns submitted by enterprises to the Revenue Commissioners with the CBR (to obtain enterprise based attributes) and the Client Record System from the Department of Social Protection (DSP) (to obtain person based attributes). CSO employs a Protected Identifier Key to protect the identity of individuals prior to making the dataset available for analysis.

4.2 Coding

See the Job Churn background notes[4].

4.3 Data Editing

See the Job Churn background notes[5].

4.4 Imputation (for Non-Response or Incomplete Data Sets)

Not applicable.

4.5 Grossing and Weighting

Not applicable.

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[3] http://www.cso.ie/px/u/NACECoder/NACEItems/searchnace.asp
[4] http://www.cso.ie/en/surveysandmethodology/industry/jobchurn/
[5] ibid

4.6 Computation of Outputs, Estimation Methods Used

Results are aggregated – as per Job Churn background notes[6].

4.7 Other Quality Assurance Techniques Used

See the Job Churn background notes[7].

Quality is the subject of ongoing work both within and between the Revenue Commissioners, the Department of Social Protection, and the CSO. The Revenue Commissioners and Department of Social Protection obtain data that is required to be presented to them under law.

5 Quality

5.1 Relevance

Potential uses of this information include (but are not limited to):

- Informing National employment policy decisions
- Informing on the demographic structure of employees by sector
- Providing input to labour costs analysis
- Providing information on gender pay gaps
- Identification of sectors providing job opportunities (quality of those jobs in terms of pay).

5.2 Accuracy and Reliability

5.2.1. Sampling Effect & representivity

Not applicable.

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[6] http://www.cso.ie/en/surveysandmethodology/industry/jobchurn/
[7] ibid

5.2.2. Non-Sampling Effects

5.2.2.1 Quality of the Data Sources used (other than survey register)

There is a legal requirement for enterprises and individuals to report to the Revenue Commissioners and the Department of Social Protection.

The P35L administrative data source from the Revenue Commissioners also contains information on number of weeks paid and reckonable pay (for tax purposes) for each employment record which can be used as indicators of job volume and value (and can be combined to give mean reckonable pay or an indicator of job quality).

The Job Churn Statistical Product excludes records found to be invalid and makes no adjustments at the firm level. The primary focus of the job churn product is to provide insights into the flow of workers & jobs between firms. The low incidence of invalid records is not considered to be of significance to the analysis.

Business Demography employment figures as published by CSO are considered the definitive employment figures. Business Demography includes adjustments at the firm level for invalid records.

With the CBR (see Reference No. 5.2.2.2 below) in general, there is a one to one relationship between the enterprise as defined by the CBR ID and the employer registration number (PREM number). However, in a small number of cases an enterprise group may pass all of its employment through a single PREM number attached to a single enterprise. Another type of exception occurs where an enterprise can comprise a number of legal units and hence have multiple PREM numbers. The CBR also does not have comprehensive coverage of all employment sectors. These difficulties arise due to the lack of a Unique Business Identifier across all public administration systems and also the lack of a standard methodology to profile enterprises in the Public Sector.

In relation to matching the CBR data with the other relevant administrative data sources e.g. P35L and CRS (Client Record System), while at the Enterprise level there is no unique business identifier, at the person level there is the PPSN.

The CRS is a master register of all PPSNs assigned and contains information collected at registration on date of birth, sex and nationality as declared by the applicant. The purpose of the PPSN is to uniquely identify persons/customers when engaging or transacting with the State and is assigned when a person first interacts with the State. For those born in Ireland the PPSN is assigned shortly after birth (and is required to avail of child benefit). It is acknowledged that there may be some quality issues with respect to PPSNs inherited from the old RSI number such as duplicate numbers, persons being assigned more than one RSI number or an identical RSI number (with a suffix of M or F) for husband and wife. However, for statistical purposes, these quality issues are not considered significant.

There is a time lag in that the data is presented in January of year t+2, i.e. the Jobs Churn data for 2006-2010 was made available in January 2012.

With respect to the above quality issues the data is available for the various interested researchers who may make any interpretation or assumption they deem necessary.

5.2.2.2 Register Coverage

The CBR is the Business Register of enterprises maintained by CSO. Please see section 3.6.1 above.

All employing enterprises in NACE Rev 2 sectors B - N excluding K64.20 are used for the purposes of the Jobs Churn. Please see section 5.2.2.1 above.

5.2.2.3 Non-response (Unit and Item)

Not applicable.

5.2.2.4 Measurement Errors

Please see section 5.2.2.1 above.

5.2.2.5 Processing Errors

Not applicable.

5.2.2.6 Model-related Effects

Not applicable.

5.3 Timeliness and Punctuality

5.3.1 Provisional Results

Not applicable.

5.3.2 Final Results

Typically 12 months from the end of the reference period.

5.4 Coherence

The Jobs Churn product tracks the flow of workers between jobs. Survey vehicles such the Labour Force Survey are limited in their ability to track the flow of workers between jobs, in that they focus on specific variables concerning employment and unemployment.

5.5 Comparability

The Jobs Churn is an experimental product, which will be published annually. It draws from similar studies and work[8] carried out in a number of different countries listed below.

Significant challenges are presented in much of the literature with respect to bringing the firm based components, job creation (JC) and job destruction (JD), together with the person based components, hirings (H) and separations (S), as typically they are derived from different sources.

However, with the increasing recognition of the value of administrative data for statistical purposes, the use of employer-employee returns to tax authorities is of high value due to the 'single source' nature of the data when calculating and comparing the various components.

In the US (Burgess, Lane, & Stevens, 2000), Finland (Ilmakunnas & Maliranta, 2001), Germany (Guertzgen, 2007) and Norway (Li, 2010) employer-employee linked data sources have facilitated more comprehensive and in-depth insights into both job and worker components of job churn and how they interact with each other. The potential of such linked datasets is significant for obtaining insights into the movements of jobs and workers. These insights are of particular value to evaluating and informing policy analysis with respect to market dynamics for both jobs and workers.

Bassanini et al (2009) present the underlying theory (including calculations and how they are derived) with respect to job churn in a clear manner with a view to bringing together results from many different studies and countries to undertake cross-country comparisons. That theory as presented has formed the basis of how the author has developed and calculated the various job churn components in this work.

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[8] See 6.1 Methodological Background Papers below

5.6 Accessibility and Clarity

5.6.1 Assistance to Users, Special Analyses

Job churn summary description:

http://www.cso.ie/en/surveysandmethodology/industry/jobchurn/

Job churn background notes:

http://cso.ie/shorturl.aspx/101

Job churn Statbank:

http://cso.ie/shorturl.aspx/102

5.6.2 Revisions

Updates to the previous year's data will be supplied along with the current year's data.

5.6.3 Publications

5.6.3.1 Releases, Regular Publications

Detailed statistical information from this project is available through CSO online databases at http://www.cso.ie/px in order to facilitate further exploration by researchers and policy analysts. This detail includes:

- An economic activity breakdown (150 codes) as per Business Demography system across all datasets
- Job churn components described in this paper for each economic activity code and employment size class
- Age, sex and economic activity breakdown for Hirings, Separations and Job Stayers (measures also include Employment records, Value of reckonable pay, Volume of Work)
- Separations analysis by economic activity, whether re-employed or not (measures also include mean weekly reckonable pay from separating employment)
- Sectoral flow analysis of those separations finding re-employment categorised by whether mean weekly reckonable pay increased or not.

5.6.3.2 Statistical Reports

Not applicable.

5.6.3.3 Internet

The publication is available on our website: http://cso.ie/shorturl.aspx/102

5.6.4 Confidentiality

All data are treated as strictly confidential in accordance with Part V of the Statistics Act, 1993. Only aggregate statistical data is disseminated. Perturbation and or rounding has been used on small cell counts. The top 0.1% of earners has been excluded from this analysis.

6 Additional documentation and publications

Additional Job churn information is available on StatCentral – the portal to Ireland's official statistics. http://cso.ie/shorturl.aspx/102

6.1 Methodological Background Papers

Bassanini, A., & Marianna, P. (2009). *Looking inside the perpetual motion machine: job and worker flows in OECD countries.* Retrieved from http://www.oecd.org.

Burgess, S., Lane, J., & Stevens, D. (2000). Job Flows, Worker Flows and Churning. *Journal of Labor Economics , 18* (3).

Fox, R. (2009, June). *Job Opportunities in the Downturn.* Retrieved March 15, 2011, from http://www.fas.ie/NR/rdonlyres/9ABC5EE1-CF20-4AA5-ACA4-C5B81DD9FE5E/793/jobsdownturn96.pdf

Guertzgen, N. (2007). *Job and Worker reallocation in German establishments: the role of employers' wage policies and labour market equilibriums.* Discussion paper, Centre for European Economic Research, Mannheim.

Ilmakunnas, P., & Maliranta, M. (2001). *The turnover of jobs and workers in a deep recession: evidence from the Finnish business sector.* Helsinki School of Economics and Business Administration; The Research Institute of the Finnish Economy. Helsinki: The Research Institute of the Finnish Economy.

Li, D. (2010). *Job reallocation and labour mobility among heterogeneous firms in Norway.* Working Paper, Ragnar Frisch Centre for Economic Research.

APPENDIX

From Dunne, J. (2011) *'Exploiting administrative data to investigate where those leaving jobs get re-employed',* Central Statistics Office, Ireland [9].

Definitions and Methodology

The definitions and methodology used are adapted from those in (Bassanini & Marianna, 2009) to take account of methodology used in Eurostat-OECD Manual on Business Demography Statistics and shortcomings in the available data sources. The available data source does not have point in time measurements. Business Demography Statistics manual uses a methodology where year t is compared with year t-1.

The business unit of observation is that of an enterprise as defined in statistical legislation. Where administrative units have not been properly profiled into statistical units a one to one correspondence is assumed.

The primary variables for analysis at the business unit level are obtained by comparing data between two periods (calendar years) such that the following identity holds for each business unit:

$$\Delta E_{it} = JC_{it} - JD_{it} = H_{it} - S_{it}$$

where E, JC, JD, H and S represent employment, job creation, job destruction, hirings and separations and Δ for differences between period t-1 and t.

Employment for the business unit in period t is estimated as the number of valid employment records with non zero reckonable pay[10] for that business unit in the period. This estimate does not factor in duration of employment or whether an employment is part-time or full-time in nature.

Job creation is measured as the difference in the number of employment records with non zero reckonable pay between two periods, t and t-1, if that difference is positive, zero otherwise and is assigned to period t.

Conversely, job destruction is measured as the difference in the number of employment records with non zero reckonable pay between two periods if that difference is negative, zero otherwise and is assigned to period t. In order for the identity to hold the jobs destructed figures are assigned to period t even though technically the jobs were lost in period t-1.

Hirings for the business unit are calculated as the number of employment records assigned to an individual in period t for which a corresponding employment record for that individual did not exist in period t-1 with respect to the business unit.

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[9] http://isi2011.congressplanner.eu/pdfs/p_450470.pdf

[10] The primary difference between reckonable pay and gross pay is that reckonable pay excludes any payments to a pension schemes or permanent health insurance schemes recognised by the Irish Tax Authorities.

Conversely, separations for the business unit are calculated as the number of employment records assigned to an individual in period t-1 for which a corresponding employment record for that individual did not exist in period t with respect to the business unit. Again, while technically the separations occur sometime in period t-1, for the identity to hold the estimated separations figure is assigned to period t.

Job stayers (JS) for the business unit are calculated as the number of employment records assigned to an individual in period t-1 for which a corresponding employment record exists for that individual in period t.

Job destruction figures for a group of business units is obtained by summing the figures for the business units in that group (i.e., for a group of business units classified to a specific sector). Job creation, hirings, job stayers and separations for a group of business units are also obtained in the same way.

Total job reallocation (REALJ) refers to the sum of job creation (JC) and job destruction (JD) for a group of business units. Excess job reallocation (EXCJ) for a group of business units is defined as the difference between total job reallocation (REALJ) and the absolute net change in total employment (|JC - JD|), for group j at period t:

$$EXCJ_{jt} = REALJ_{jt} - \left| \Delta E_{jt} \right| = JC_{jt} + JD_{jt} - \left| JC_{jt} - JD_{jt} \right|$$

Excess job reallocation provides a measure of the offsetting job creation and job destruction within a group of firms.

When aggregating over a group of business units with similar characteristics, generally speaking, job creation (JC) can be considered as the sum of employment growth from all expanding and new firms, while job destruction (JD) can be considered as the number of jobs lost from contracting or exiting firms. It should be noted that expanding and contracting business units are assigned these attributes based on volume or number of weeks work paid – therefore it is possible for contracting firms to have job creation and expanding firms to have job destruction (i.e., two employees each with 16 recorded weeks paid compared with one employee with 52 recorded weeks paid).

Worker reallocations are dealt with in a similar manner. Total worker reallocation (REALW) by summing hirings (H) and separations (S) over all members of a specified group, the group can be defined either by a group of firms or on a particular demographic characteristics (age, gender etc). Excess worker reallocation (REALW) for a group is defined as the difference between total worker reallocation (REALW) and the group's absolute net change in employment (|H - S|). So for group j at period t:

$$EXCW_{jt} = REALW_{jt} - \left| \Delta E_{jt} \right| = H_{jt} + S_{jt} - \left| H_{jt} - S_{jt} \right|$$

Excess worker reallocation provides a useful measure of the number of job matches over and above the minimum necessary to accommodate net employment growth; in other words, it

reflects the reallocation of job matches (reshuffling of jobs and workers) within the same group (Bassanini & Marianna, 2009).

At the business unit level, churning flows (CH) is the difference between excess worker reallocation and excess job reallocation. Churning flows represent labour reallocation arising from firms churning workers through continuing jobs or employees quitting and being replaced on those jobs. So for group j in period t:

$$CH_{jt} = EXCW_{jt} - EXCJ_{jt} = REALW_{jt} - REALJ_{jt} = H_{jt} + S_{jt} - JC_{jt} - JD_{jt}$$

All flow measures from period t-1 to period t are expressed as rates by dividing flow totals by relevant average employment figures in period t-1 and period t.

In adhering to recommendations in the literature, an average of the number of employments at year t and t-1 is used as the denominator in the calculation of rates with respect to reference period t.