

# The Impact of a Demand Shock on the Employment of Temporary Agency Workers: Evidence from Japan during the global financial crisis

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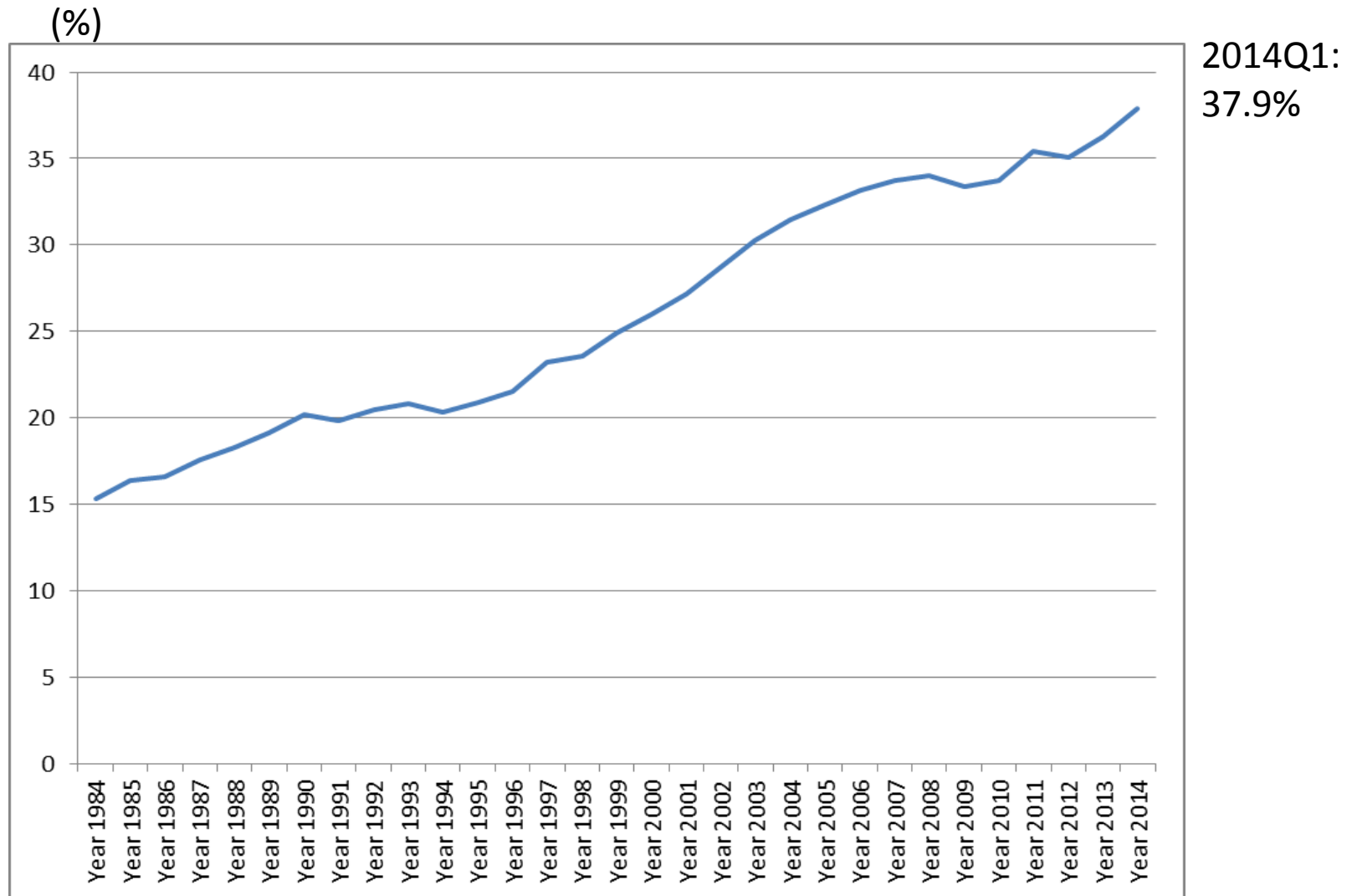
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# Outline

- A quick review of non-regular workers in Japan
- Motivation of the paper
- Existing literature
- Data
- Methodology
- Estimation results
- Summary and conclusion
- Implications

# Change in the Ratio of Non-Regular Workers



Source: "Labour Force Survey", Ministry of Internal Affairs and Communications

# Details on Recent Ratios of Non-Regular Workers

Company employees, excluding executives	Regular employees	Non-regular employees	Part-time workers, <i>arbeit</i>		Dispatched workers from temporary work agencies	Contract employees	Other		
			Part-time workers	<i>arbeit</i>					
(%)									
2014 Jul.-Sep. average	<b>100.0</b>	<b>62.9</b>	<b>37.1</b>	<b>25.4</b>	<b>17.7</b>	<b>7.6</b>	<b>2.2</b>	<b>7.9</b>	<b>1.7</b>

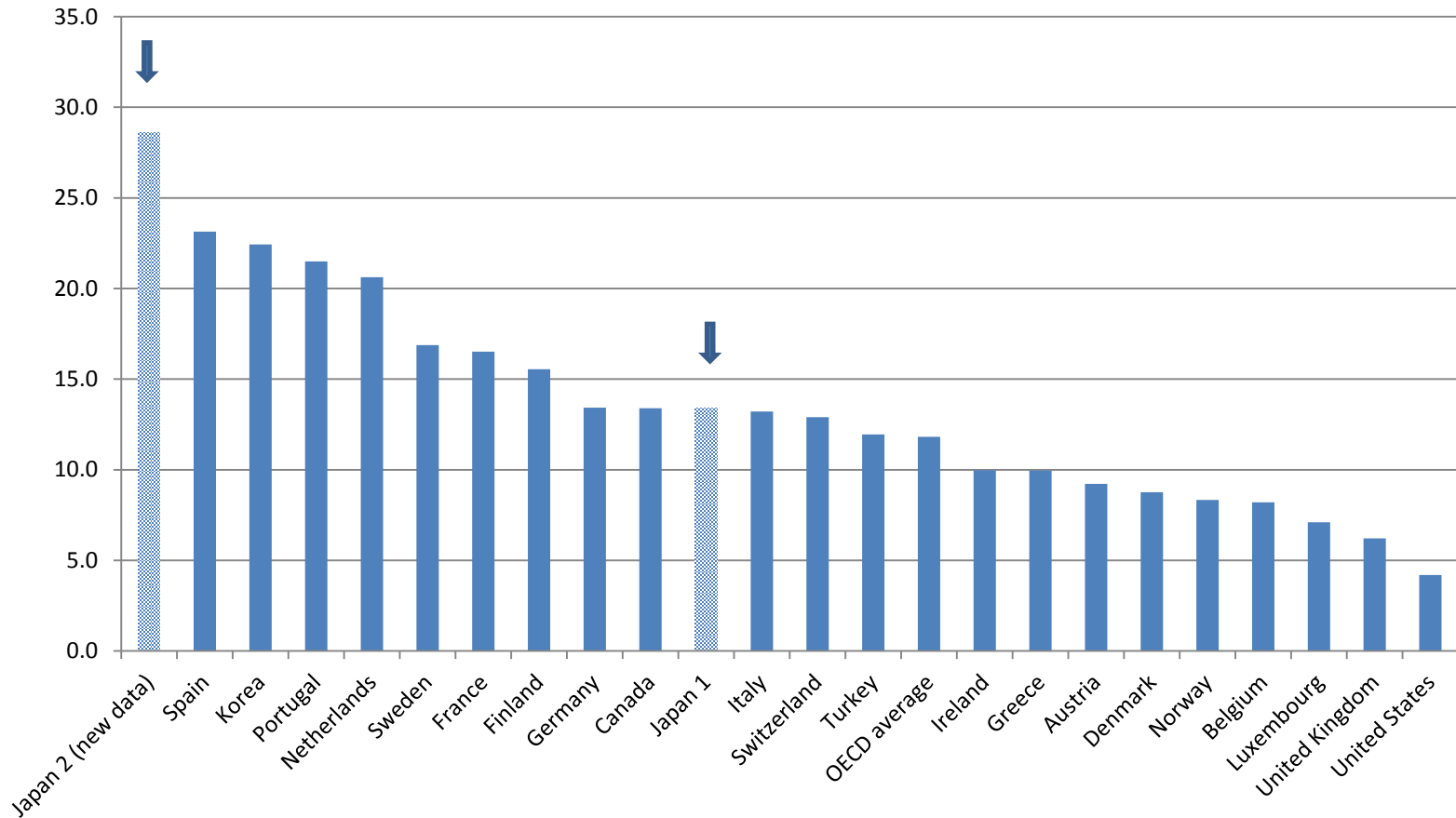
↓ Released from January, 2013

Non-agricultural employees, excluding executives	Indefinite-term ("permanent") employees	Fixed-term employees (total)	Fixed-term Employees (more than one year)			
			Casual workers	Daily workers		
(%)						
2014 Jul.-Sep. average	<b>100.0</b>	<b>71.4</b>	<b>28.6</b>	<b>18.5</b>	<b>6.7</b>	<b>1.3</b>

Source: "Labour Force Survey", Ministry of Internal Affairs and Communications

# Ratio of Temporary Workers: OECD Countries (2013)

(%)



(Source) OECD Stat.

# Ratio of Temporary Workers: OECD Data

- In Japan,
  - 1985: 10.2% (Male: 5.1%, Female: 19.3%) → 2009: 13.7% (Male: 8.1%, Female: 21.3%) → 2013: 13.7%
  - Source: Monthly Household Labour Force Survey.
  - Temporary worker: A worker whose main job is a fixed-term contract lasting not more than one year, occasional, casual or seasonal work, daily workers, or work lasting less than 12 months.
- As a whole,
  - North America 1985: 8.0% → 2009: 7.5% → 2011: 7.6%
  - Europe 1985: 9.1% → 2009: 14.0% → 2013: 14.2%
  - OECD (Whole) 1985: 9.4% → 2009: 11.6% → 2013: 11.8%
- Examples of countries whose ratio has increased,
  - Spain 1987: 15.6% → 2009: 25.4% → 2013: 23.1% (95: 35.0%, 2006: 34.0%, 2008: 29.3%)
  - Portugal 1986: 14.4% → 2009: 22.0% → 2013: 21.5%
  - Netherlands 1985: 7.6% → 2009: 18.3% → 2013: 20.6%
  - Germany 1985: 10.0% → 2009: 14.5% → 2013: 13.4%
  - France 1985: 4.7% → 2009: 13.5% → 2013: 16.5% (2000: 15.5%)
  - Italy 1985: 4.8% → 2009: 12.5% → 2011: 13.2% (2008: 13.3%)
- While the ratio of fixed-term workers has been low and has not increased in the English-speaking world, many countries which have deregulated fixed-term employment have experienced a rise in the ratio of fixed-term workers.

# Ratio of Non-Regular Workers by Length of Contract

Male and Female (%)	Male and Female			Male			Female		
	More than one year	One year or less	Total	More than one year	One year or less	Total	More than one year	One year or less	Total
1982	4.6	12.3	16.9	1.6	6.7	8.3	9.7	22.0	31.7
1987	6.9	12.8	19.7	2.2	6.9	9.1	14.6	22.4	37.1
1992	9.6	12.1	21.7	3.1	6.8	9.9	19.2	19.9	39.1
1997	12.0	12.7	24.6	3.9	7.3	11.2	23.6	20.4	44.0
2002	16.6	15.5	32.0	7.3	9.2	16.5	29.2	23.9	53.0
2007	21.7	13.9	35.6	10.7	9.2	20.0	35.5	19.7	55.3

Source: "Employment Status Survey", Ministry of Internal Affairs and Communications

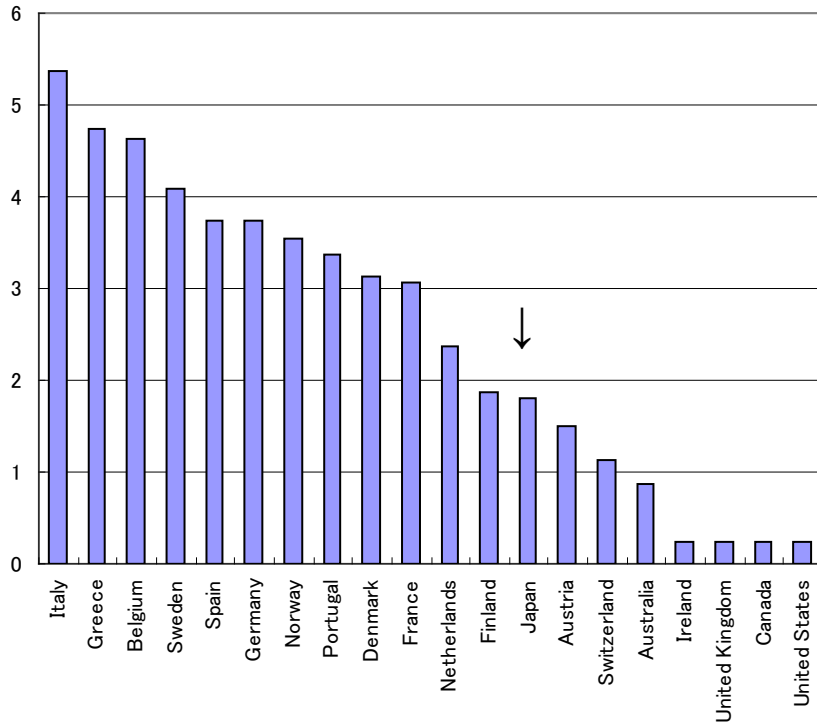
# Background to the Increase of Fixed-Term Workers

- Macro factors:
  - Rise of uncertainty, end of stable economic growth
  - ↓
  - A quantitative flexibility in employment adjustment became necessary.
- Micro (structural) factors:
  - Increasing competition in the product market due to global competition and deregulation
  - Obsolescence of human resources associated with IT development
  - ↓
  - Need to reduce cost / acquire inexpensive labor.
- Deregulation on temporary Workers ?

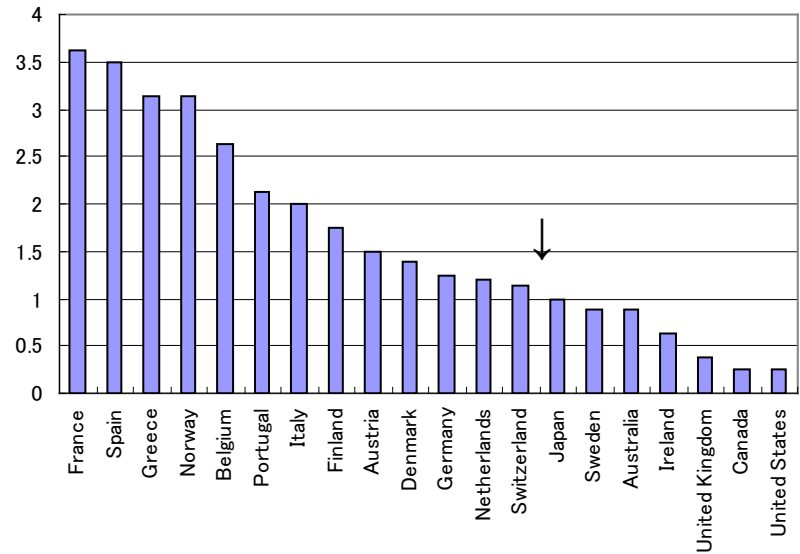


# Regulation on Temporary Workers

1985



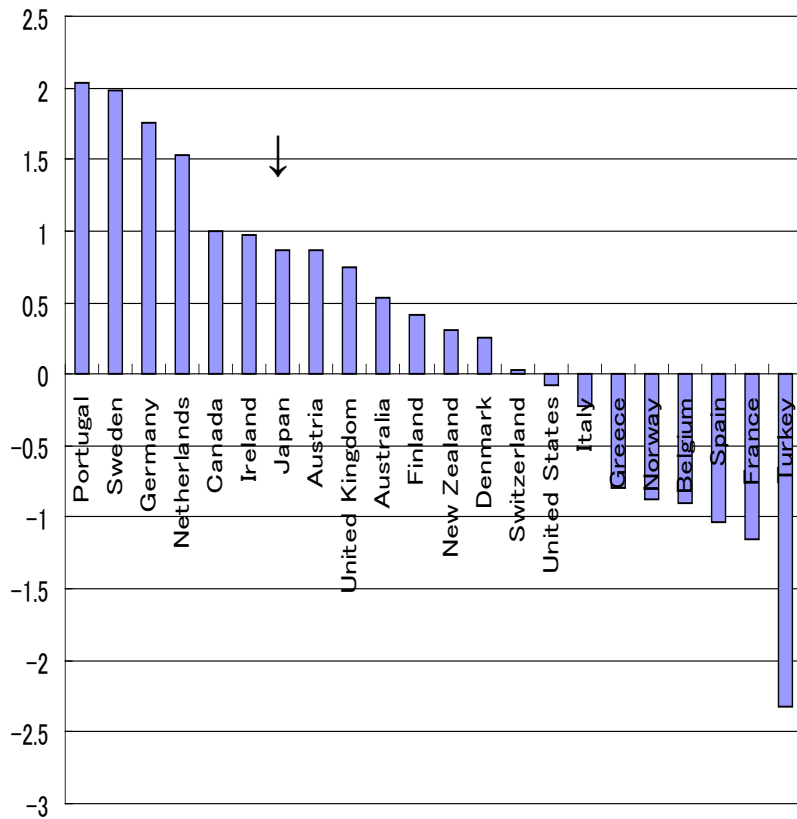
2008



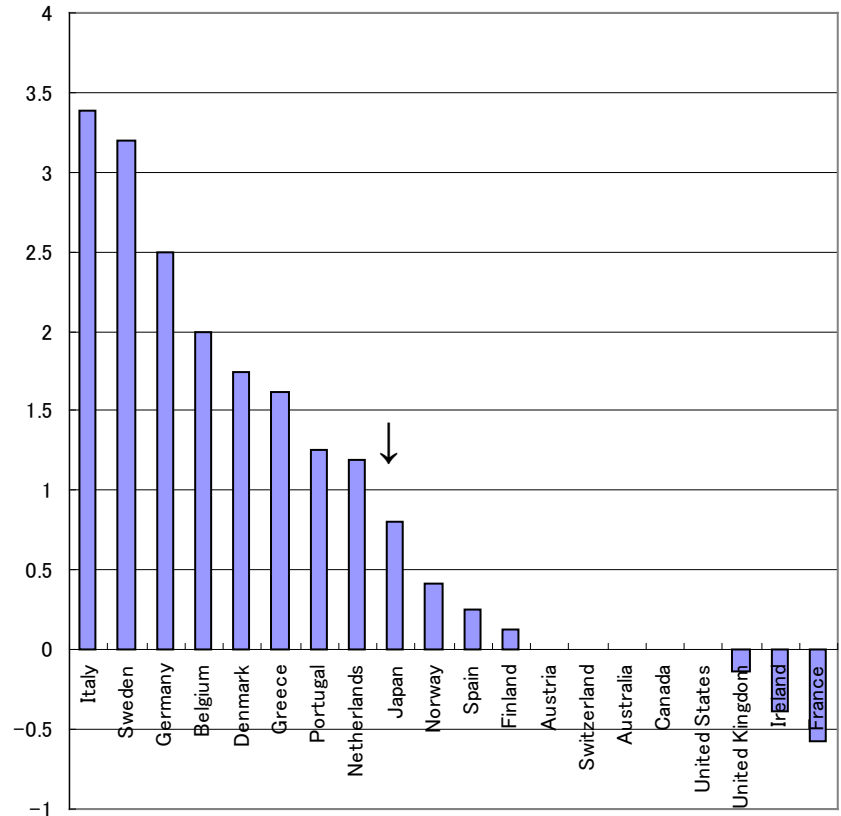
Japan has always had weak regulations on temporary workers  
(among the weakest of the non-English speaking countries)

Source: OECD Stat.

1) Employment Protection Index for Regular Workers – Regulation Index for Temporary Workers (2008)

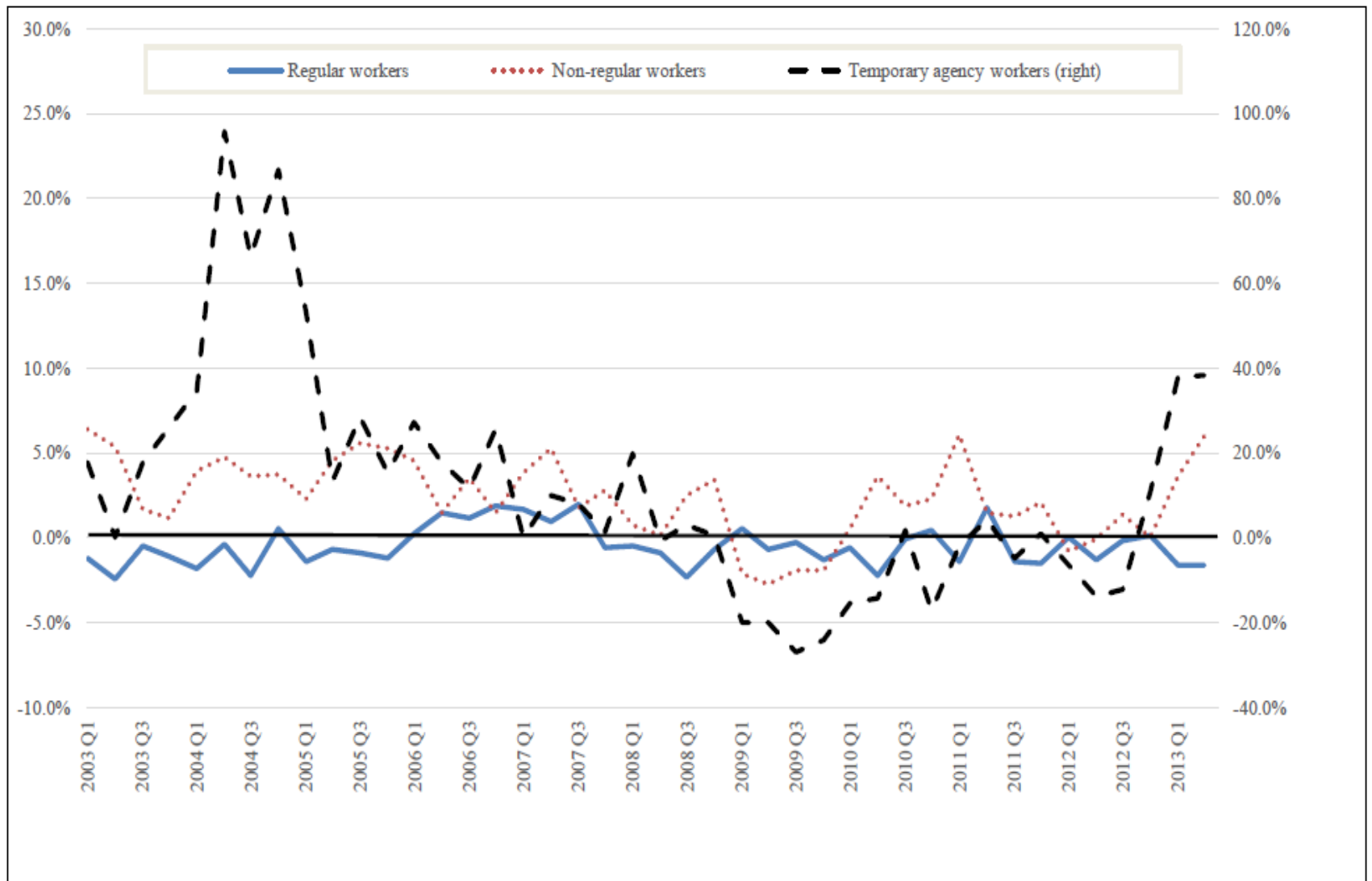


2) Change in Regulation on Temporary Workers (Index in 1985 – Index in 2008)



(Source) OECD Stat.

Figure 1. Number of regular workers, Non-regular workers and Temporary agency workers in Japan



Source: Labour force survey.

**The Impact of a Demand Shock on the Employment of Temporary Agency Workers:  
Evidence from Japan during the global financial crisis<sup>1</sup>**

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**Abstract**

This study investigates the effect of a negative demand shock on the composition of the type of workers at firms, focusing on the change in the share of temporary agency in all workers. To clearly identify the causal link between the demand a firm faces and the composition of its workforce in terms of the type of workers and rule out any reverse causation, we use the 2007–2009 global financial crisis as a natural experiment, with the drop in demand experienced by exporting firms in Japan serving as an exogenous demand shock. We find that firms with a higher export ratio, a higher share of temporary agency workers, and a larger increase in the share of temporary agency worker ratio prior to the crisis decreased the share of temporary agency workers more than other firms in response to the demand shock. We also find that firms with a higher liquid asset ratio and higher volatility in their sales decreased the share of temporary agency workers less than other firms during the crisis. These results suggest that temporary agency workers serve as a buffer against demand shocks.

*Keywords:* Demand shock, Temporary agency worker, Employment adjustment

*JEL classification:* J21, J23, E24

# Motivation 1

- Relatively little empirical evidence that firms actually use temporary workers to adjust employment levels in response to demand fluctuations
- Demand shocks may affect the share of temporary workers at a firm.
- However, the share of temporary workers is also likely to affect the firm's productivity and hence its output.
- We overcome this identification problem using the global financial crisis of 2007–2009 as a natural experiment, with the precipitous drop in global demand representing an exogenous demand shock to Japanese exporters.

# Motivation 2

- Why do we focus on temporary agency workers among the various types of non-regular workers found in Japan ?
- Dismissing temporary agency workers is considerably easier than dismissing other types of non-regular workers and far easier than dismissing permanent (or regular) workers.
- The number of temporary agency workers in Japan has been much more volatile than that of other types of workers.
- The number of temporary agency workers increased substantially and relatively steadily in the early 2000s, but then suddenly decreased from late 2008 in the wake of the global financial crisis.

# Existing Literature

- Reasons firms use or increase temporary workers
  - Using either the U.S. or Japanese firm-level data, a number of studies find that firms facing a high degree of uncertainty about future production tend to use temporary workers as a buffer to employment fluctuations (Cappelli and Neumark, 2004; Houseman, 2001; Ono and Sullivan, 2006; Morikawa, 2010; Asano, Ito and Kawaguchi, 2011; Dräger and Marx, 2012).
  - Relaxing regulations on the protection of temporary workers results in the increase in total employment during booms and eventually in the increase in the volatility of total employment. Most of the studies examining employment at European firms, obtain evidence supporting the hypothesis (Boeri and Garibaldi, 2007; Boeri, 2011; Bentolila and Saint-Paul, 1992; Sala, Silva and Toledo, 2012; Costain, Jimeno and Thomas, 2010).
- The effects of liquidity dry-up in financial markets during the global financial crisis on employment
  - Using either the U.S. or European data, most of the recent studies find negative effects of liquidity shortage on employment (Boeri, Garibaldi and Moen, 2012, 2013; Chodorow-Reich, 2014; Carneiro, Portugal and Varejao, 2013).

# Data Source

- The Basic Survey of Business Structure and Activities compiled by the Ministry of Economy, Trade and Industry
  - All enterprises in Japan with more than 50 employees and with paid-up capital of over 30 million yen.
  - Firm-level data on the number of temporary agency and other types of workers, as well as exports, sales, and equity capital
- The NEEDS-Corporate Governance and Evaluation System (NEEDS-CGES) database provided by Nikkei Digital Media Inc
  - All firms listed on a stock exchange in Japan
  - Firm-level data on the ownership share of foreign shareholders
- The Corporate Finance Databank provided by the Japan Economic Research Institute
  - All firms listed on a stock exchange in Japan
  - Firm-level data on liquid assets



# Sample selection

- Step1: We match firms in the NEEDS-CGES and BSBSA datasets. This leaves us with **1,962 firms**.
- Step2: We select firms which reported non-zero exports in 2006. Of the 1,962 firms obtained in the previous step, 1,863 firms provided information on exports for 2006, **with 962 reporting non-zero exports**.
- Step3: we select firms for which all the other information required for the analysis is available. Because **information on the number of temporary agency workers is available** only for a relatively small number of firms, we are left with **360 firms** at this stage.
- Step4: to exclude outliers, we drop firms for which the change in the share of temporary agency workers (which is the dependent variable in the regression analysis below) falls into either of the 1% tails of its distribution. We end up with **353 firms** to use for the analysis.

**Table 1. Industry composition****(a) Industry composition of the 962 firms**

SNA Industry Classification	Number of firms	Share (%)	Cumulative share (%)
Food products and beverages	25	2.60	2.60
Textiles	16	1.66	4.26
Pulp, paper and paper products	10	1.04	5.30
Chemicals	109	11.33	16.63
Petroleum and coal products	4	0.42	17.05
Non-metallic mineral products	29	3.01	20.06
Basic metal	43	4.47	24.53
Fabricated metal products	30	3.12	27.65
Machinery	119	12.37	40.02
Electrical machinery	169	17.57	57.59
Transport equipment	83	8.63	66.22
Precision instruments	69	7.17	73.39
Other manufacturing	41	4.26	77.65
Construction	8	0.83	78.48
Wholesale and retail trade	189	19.65	98.13
Service activities	18	1.87	100.00
<b>Total</b>	<b>962</b>	<b>100</b>	

Note: The table is based on the 962 firms that could be matched in the BSBSA and NEEDS-CGES databases and that reported non-zero exports in 2006.

**(b) Industry composition of the 353 firms**

SNA Industry Classification	Number of firms	Share (%)	Cumulative share (%)
Food products and beverages	9	2.50	2.50
Textiles	3	0.83	3.33
Pulp, paper and paper products	5	1.39	4.72
Chemicals	46	12.78	17.50
Petroleum and coal products	1	0.28	17.78
Non-metallic mineral products	12	3.33	21.11
Basic metal	22	6.11	27.22
Fabricated metal products	9	2.50	29.72
Machinery	40	11.11	40.83
Electrical machinery	59	16.39	57.22
Transport equipment	38	10.56	67.78
Precision instruments	15	4.17	71.94
Other manufacturing	29	8.06	80.00
Construction	2	0.56	80.56
Wholesale and retail trade	68	18.89	99.44
Service activities	2	0.56	100.00
<b>Total</b>	<b>360</b>	<b>100</b>	

Note: The table is for the 353 firms that make up the dataset for our analysis.

# Methodology

$$\begin{aligned}\Delta Temp_{i2009} = & \beta_1 Export_{i2006} + \beta_2 Liquidity_{i2006} + \beta_3 Temp_{i2006} \\ & + \beta_4 \Delta Temp_{i2006} + \beta_5 Volatility_{i2006} + \beta_6 ForeignOwn_{i2006} \\ & + \beta_7 ROA_{i2006} + \beta_8 Size_{i2006} + \beta_9 Equity_{i2006} + Industry_s + \varepsilon_i.\end{aligned}$$

- $\Delta Temp_{2009}$ : the change in the share of temporary agency workers from fiscal year 2007 to fiscal year 2009
- As for the explanatory variables we use **their values for fiscal year 2006** (except for the industry dummies)
- **Export2006**: the share of exports to total sales
- **Liquidity2006**: the ratio of cash and deposits to total assets
- **Temp2006**: the ratio of temporary agency workers to full-time workers
- **$\Delta Temp_{2006}$** : the difference in the shares of temporary agency workers from fiscal year 2004 to fiscal year 2006.
- **Volatility2006**: the standard deviation in the sales growth from fiscal year 2002 to fiscal year 2006
- **ForeignOwn2006**: the share held by foreign shareholders
- **ROA2006**: the ratio of current income to total assets
- **Size<sub>2006</sub>**: the logarithm of total assets
- **Equity2006**: the ratio of capital to total assets
- **Industry**: the 22 industry dummies based on the SNA classification,

Table 2. Descriptive statistics

	Mean	Median	Maximum	Minimum	Standard deviation	Number of observations
<i>ΔTemp</i> <sub>2009</sub>	-0.066	-0.042	0.098	-0.488	0.089	353
<i>Exports</i> <sub>2006</sub>	0.168	0.105	0.924	0.000	0.184	353
<i>Liquidity</i> <sub>2006</sub>	0.102	0.080	0.541	0.001	0.090	353
<i>Temp</i> <sub>2006</sub>	0.117	0.080	0.598	0.000	0.112	353
<i>ΔTemp</i> <sub>2006</sub>	0.013	0.009	0.191	-0.212	0.030	353
<i>Volatility</i> <sub>2006</sub>	31907	4009	1165742	151	110503	353
<i>ForeignOwn</i> <sub>2006</sub>	12.851	9.840	52.820	0.000	11.229	353
<i>ROA</i> <sub>2006</sub>	0.067	0.058	0.324	-0.084	0.053	353
<i>Size</i> <sub>2006</sub>	11.290	11.008	17.296	8.056	1.549	353
<i>Equity</i> <sub>2006</sub>	0.521	0.516	0.903	0.077	0.184	353

Note: Volatility is the standard deviation in sales growth from fiscal 2002 to fiscal 2006.

**Temp: the ratio of temporary agency workers to full-time workers**

Table 3. Estimation results

The dependent variable:  $\Delta\text{Temp}_{2009}$ 

	(1)		(2)	
	Coefficient	Standard Error	Coefficient	Standard Error
Export <sub>2006</sub>	-0.054	0.018 ***	-0.076	0.020 ***
Liquidity <sub>2006</sub>	0.094	0.043 **	0.098	0.044 **
Temp <sub>2006</sub>	-0.353	0.102 ***	-0.421	0.064 ***
$\Delta\text{Temp}_{2006}$	-0.409	0.169 **	-0.352	0.155 **
Volatility <sub>2006</sub>	9.E-08	5.E-08 *	7.E-08	3.E-08 *
ForeignOwn <sub>2006</sub>	0.001	0.001	0.001	0.001 *
ROA <sub>2006</sub>	0.013	0.092	-0.028	0.104
Size <sub>2006</sub>	-0.004	0.005	-0.004	0.006
Equity <sub>2006</sub>	-0.020	0.027	0.003	0.038
Constant	0.056	0.053	0.022	0.058
Industry dummy	Yes		No	
Number of obs	353		353	
F	.		154.97	
Prob > F	.		0	
R-squared	0.522		0.438	
Root MSE	0.063		0.067	

Notes: As for the explanatory variables we use their values for fiscal year 2006 (except for the industry dummies).

Volatility is the standard deviation in the sales growth from fiscal year 2002 to fiscal year 2006.

Robust standard errors are given in Table 3.

F-test fails in Column (1) because the variance-covariance matrix is not of full rank.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Summary and Conclusion

- This paper examines the effect of negative demand shocks on the composition of workers by type at firms, focusing on the change in the ratio of temporary agency workers to regular workers.
- We use the global financial crisis of 2007-09 as a natural experiment of demand shocks to exporting firms in Japan and analyze the changes in employee composition at them.
  - Firms that had had a higher exporting ratio, a higher temporary agency worker ratio, and a larger increase of temporary agency worker ratio before the crisis decreased their temporary agency worker ratio to a greater extent during the crisis.
  - Firms that had had a higher liquidity to asset ratio and a larger volatility of changes in sales decreased the temporary agency worker ratio to a lesser extent during the crisis.
- These results suggest that temporary agency workers served as a buffer to demand shocks.

# Implications

- Globalization and integration of the world economy
- ↓
- More external demand and financial shocks
- ↓
- Increases in uncertainty and volatility of demand
- ↓
- More need for a buffer to absorb these shocks
- ↓
- Increase in the share of temporary employment
- ↓
- Concentrated adjustment in temporary employment in response to negative shocks
- ↓
- More need for employment stability of temporary workers from the policy viewpoint

Thank you for your attention !



Supplementary materials:  
Issues on labor market dualism  
in Japan

# The Problems of the Increase of Fixed-Term Workers

- Quantitative flexibility → Unstable Labor
- Cost reduction / inexpensive labor → Labor Condition Disparities
- Decreasing opportunities for education/training → Deterioration of Labor Quality

# Wage Gap between Regular and Fixed-Term Workers

- Europe (OECD [2002])
  - Spain: 47%, France: 29%, Belgium: 21%, Austria: 19%, Germany: 17%
  - Controlling for individual characteristics, such as age, education, type of occupation etc...→Decrease to 10~20%

- In Japan

- Wage for regular worker : Wage for Fixed-Term Worker

$$=100 : 68$$

(Asao [2001], Using Basic Survey on Wage Structure)

- Individual characteristics are not controlled for.

- Controlling for gender, education, occupation, and age:

$$=100 : 85.5 (Male) \quad 100 : 82.4 (Female)$$

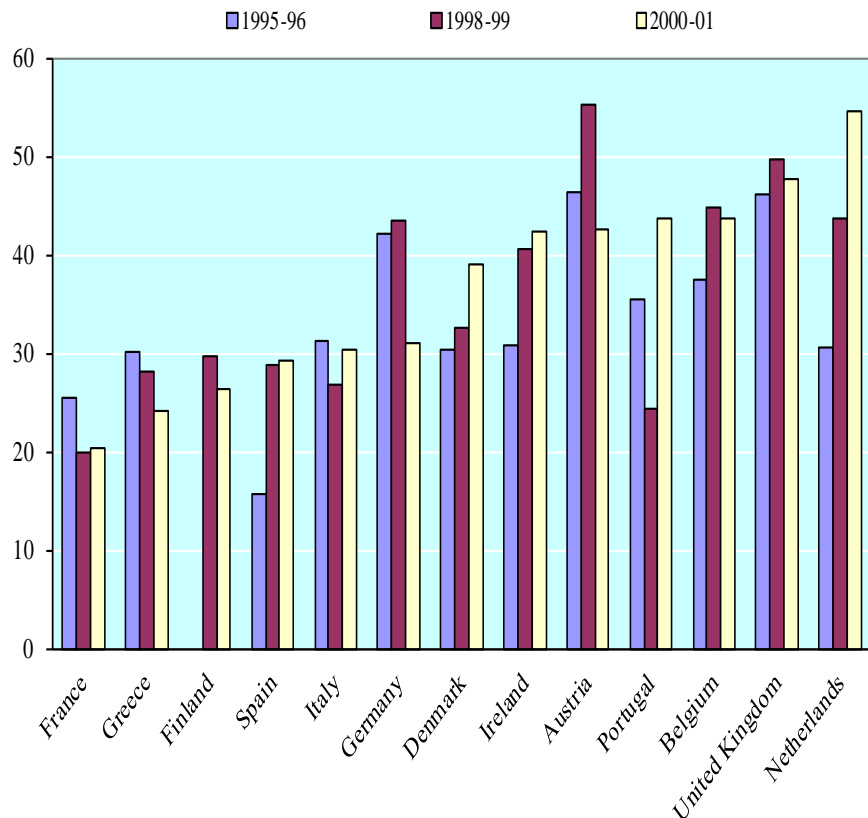
(Asao [2010], Using special summary of “General Survey on Diversified Types of Employment”, Ministry of Health, Labour and Welfare)

- The Wage Gap between Regular/Fixed-Term Workers is about same as in Europe.

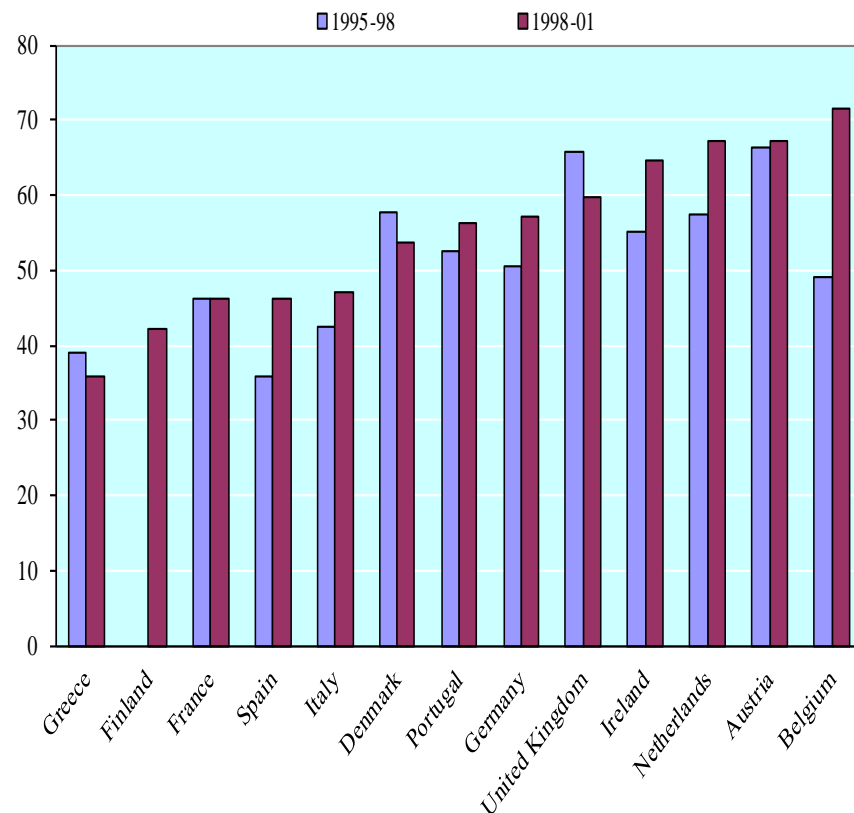
# Mobility from Fixed-Term to Regular Jobs

Figure W5.2. Evolution of one-year and three-year mobility from temporary to permanent jobs since mid-1990s

Panel A. One-year mobility



Panel B. Three-year mobility

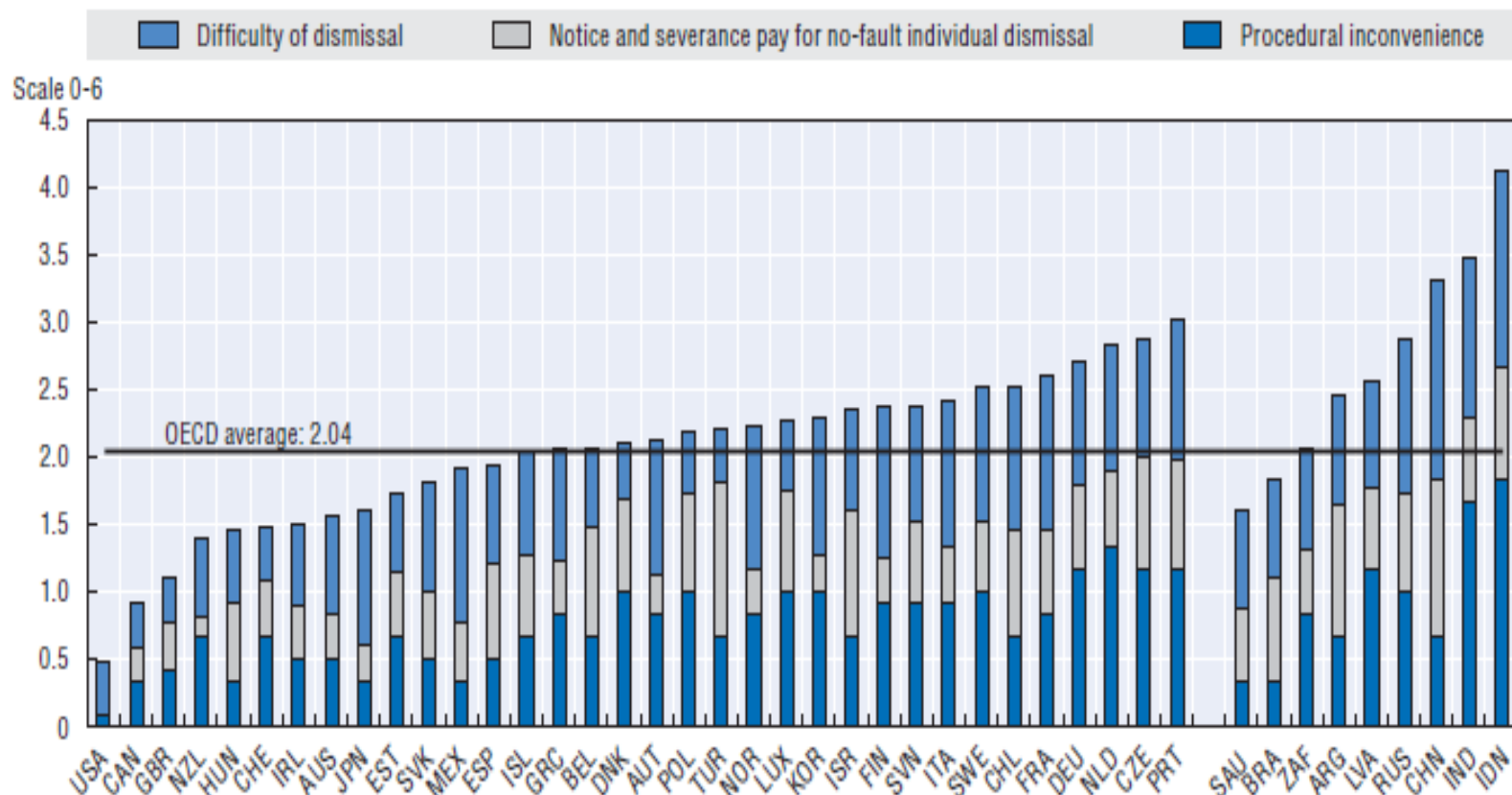


Source: OECD calculations based on the European Community Household Panel (ECHP), waves 2 to 8.

# Analyses of the Ratio of Transition from Non-Regular to Regular Employment

- Kume and Tsuru (2013)
  - Using “Employment Status Survey”, Ministry of Internal Affairs and Communications (2002, 2007)
  - Ratio of Workers who transitioned from non-regular to regular jobs within the past 5 years:  
About 25% (Male: About 40%, Female: About 20%)
- Kosugi (2010)
  - Using “Labour Force Survey”, Ministry of Internal Affairs and Communications
  - 19% of persons aged 15 to 34 who left a non-regular job during the last year transitioned to a regular job (2005)
- **Japan is in the lowest group, even compared with the European Countries.**

Figure 2.4. Protection of permanent workers against individual dismissal



Note: Data refer to 2013 for OECD countries and Latvia, 2012 for other countries. The figure presents the contribution of different subcomponents to the indicator for employment protection for regular workers against individual dismissal (EPR). The height of the bar represents the value of the EPR indicator.

Source: OECD Employment Protection Database, 2013 update, <http://dx.doi.org/10.1787/1fs-epl-data-en>.


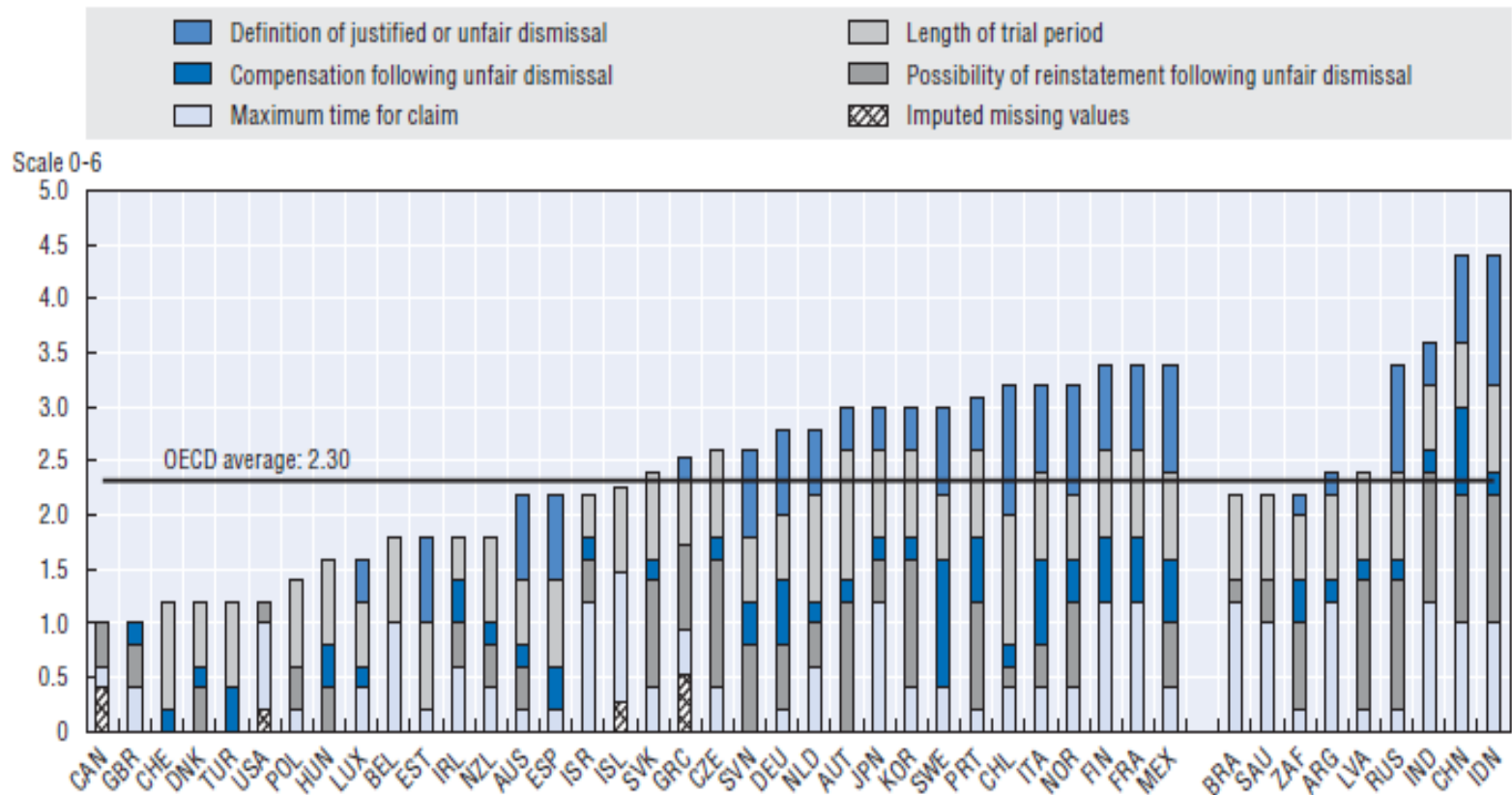
StatLink  <http://dx.doi.org/10.1787/888932852694>

Figure 2.3. Protection of permanent workers against individual dismissal: Difficulty of dismissal



Note: Data refer to 2013 for OECD countries and Latvia, 2012 for other countries. The figure presents the contribution of different subcomponents to the indicator for difficulty of dismissal. The height of the bar represents the value of the indicator for difficulty of dismissal. For the sole purpose of calculating the indicator of difficulty of dismissal, missing values of specific subcomponents are set equal to the average of other non-missing subcomponents for the same country, excluding the maximum time for claim.

Source: OECD Employment Protection Database, 2013 update, <http://dx.doi.org/10.1787/jfs-epl-data-en>.

StatLink <http://dx.doi.org/10.1787/888932852675>

# Uniqueness of Regular Employees in Japan

- Standard Definition of Regular Employees
  - (1) Indefinite Term (Permanent)
  - (2) Full-Time,
  - (3) Directly-Employed
- Additional “Implicit Contract” in Japan
  - No Limitations on Job Assignment, Place of Work, and Working Hours
- Uniqueness of Japanese regular employees
  - “Non-Restricted Regular Employees”
- Strong complementarity with firm’s comprehensive authority over the personnel matter and employment protection



# Using “Restricted-Regular” Employment to Improve the Transition to Regular Employment

- It is difficult to transition from Non-Regular to “Non-Restricted”
- We should promote and improve “Restricted-Regular” employment to prepare employees for transition to Regular workers.
  - “Restricted-Regular Employees” have restricted: (1) Duties (2) Place of Work (3) Working Hours (about half of large companies have introduced)
  - People renewing Fixed-Term contracts more than 5 years (aggregate) can apply to change to an indefinite-term contract (from April, 2013).