Labour market transitions for female workers in Japan: the role of global competition*

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Abstract

This paper studies the labour market transitions of female workers from 1993 to 2004, a period of unprecedented economic stagnation for Japan. It provides an excellent setting to investigate how workers are affected and how firms have adjusted their workforces during difficult economic times. To achieve this purpose we use data from the Japanese Panel Data on Consumers to investigate the determinants of labour market transitions for female workers. While a number of the customary demographic and sociological determinants such as marital status and low levels of education are important, there is evidence that workers in trade-exposed industries were more likely to move to part-time jobs. On the other hand, we find no evidence to support the commonly made claim that globalisation has been responsible for the changing nature of the Japanese employment relationship.

Keywords: Part-time employment in Japan; labour market transitions; female workers; globalisation; generalised latent variable model.

* Paper for presentation at the Conference on *How Globalisation is Shaping the Asia-Pacific: Multi-disciplinary Perspectives*, to be held on the Gold Coast, Queensland, Australia, September 26-27, 2008. The authors are grateful to the *Institute for Research on Household Economics* for agreeing to release confidential data. Corresponding author: Professor Tomoko Kishi, Faculty of Economics, Nanzan University, 18 Yamazato-cho, Showa-ku, Nagoya 466-8673; e-mail: kisi@nanzan-u.ac.jp.

1. Introduction

Japan has only just recently turned the corner on a dismally long decade of stagnant economic growth and unprecedented high levels of post-War unemployment. The labour market woes were coincident with the contraction of manufacturing industries. Manufacturing employment declined due to a variety of factors, e.g., the protracted economic slump, financial and bad loans-related problems as well as deindustrialisation and the structural shift to service sector industries. Another commonly-perceived culprit has been globalisation, more generally; and outsourcing, more specifically. In Japan, globalisation is commonly thought to be driving the "hollowing out" of manufacturing industry.

Associated with the industrial shifts has been a significant increase in part-time and casual forms of employment as opposed to permanent, full-time work. Some commentators regard the growth of non-standard work arrangements as the single most important change taking place in the Japanese labour market (e.g., Rebick, 2005). For the ten years to 2003, a period during which total employment in Japan stagnated, the number of part-time workers increased by 52.5 per cent (MHLW, 2004). As always, there are concerns about the quality of part-time jobs compared with that of full-time work.

A central plank of the Japanese government's labour market policy has been to increase the flexibility of the labour market. Gaston and Kishi (2005) argue that certain characteristics of Japan's unique industrial relations system may hamper rather than ease the plight of the unemployed. The need for greater flexibility may also explain the increasing preference by Japanese firms for part-time employees (Houseman and Osawa, 1995). Gaston and Kishi (2007) explain that the demand for more flexible working arrangements has also increased.

While the reasons for the growth in the part-time workforce are still not completely understood, changes in the industrial structure are likely to have been important. According to the *Employment Structure of Japan* (MIAC, 2005), from 1992 to 2002 the share of total employment in manufacturing industries fell from 24 per cent to 19 per cent; while service sector industries expanded their share from 22 per cent to 28 per cent. Due to falling labour productivity and the instability of labour demand, firms in the services sector have come to increasingly rely on non-standard workers (Kishi, 2003). In the services sector, the proportion of full-time workers fell from 77 per cent to 68 per cent from 1992 to 2002. Nearly all OECD countries have experienced rapid growth in part-time employment. Between 1987 and 1997 nearly 70 per cent of all new jobs created in Japan were part-time jobs – the OECD average was about 50 per cent (OECD, 1999). While the number of male non-standard workers has been increasing in recent years (Rebick, 2005), non-standard workers are still overwhelmingly female.

In a flat labour market it is not obvious that workers are necessarily disadvantaged by part-time work arrangements, vis-à-vis equivalent types of standard work. However, a common (and seemingly, reasonable) presumption in the literature is that in a declining economy, part-time and temporary workers are both vulnerable and exploitable (e.g., Shinozaki *et al.*, 2003). This finding is not confirmed by studies for other countries. For example, Stratton (1996), Farber (1999) and Gaston and Timcke (1999) all find that casual and part-time workers are more likely to make successful transitions to full-time work than their unemployed counterparts.

With this background in mind, this paper seeks to uncover the most important determinants of labour market transitions for female workers in Japan. The time period we consider is 1993 to 2004 – a period of unprecedented stagnation for Japan. It provides an excellent, albeit salutary, setting to investigate how workers are affected and how firms adjusted their workforces during such trying economic times. To achieve this purpose we use data from the Japanese Panel Data on Consumers (*JPSC*). In the next section, we take the slightly unorthodox approach of describing our data before adumbrating the list of hypotheses we test. We do so for a number of reasons; first, we need to make clear at the outset the precise definitions of full-time, part-time and temporary workers, which are somewhat idiosyncratic to Japan as well as specific to the data we use in this paper. Secondly, in order to economise on our justification for some of our hypotheses, we describe previous research done using the same data. Some of the findings are unsurprising and don't bear detailed discussion. Another advantage of doing so is that it enables us to spend a little more time describing what we consider the most novel aspect of our study; specifically, how globalisation may have affected labour market transitions.

Section 3 contains a brief discussion of our econometric methodology and presents the results. Specifically, we estimate a panel generalised linear latent and mixed model for workers making transitions between three labour market states: full-time jobs, part-time jobs and temporary jobs (which are combined with those not in the labour force). Section 4 contains our concluding observations.

2. The *JPSC* and our hypotheses

2.1 The JPSC. The data used for our study combine data from the Japanese Panel Data on Consumers (*JPSC*) and industry-level data obtained from various official sources. The *JPSC* collects information about economic and subjective well-being, labour market dynamics and family dynamics over time. All respondents are women from a specific year (e.g., Wave 1 respondents were women aged between 25 and 34 in 1993). Fortunately, for our purposes, most of the women are neither students nor retirees. The characteristics of each wave of the *JPSC* samples given in Appendix table A1. We use data from all twelve waves, i.e., 1993 to 2004.

The first stage of our empirical analysis uses industry fixed effects to capture industry-specific effects affecting the transitions between labour market states for female workers. Subsequently, since (rather unsurprisingly) we find that these industry effects are statistically significant, we then replace the industry dummies with industry-specific variables.

2.2 Industry data. Most previous studies of female labour supply in Japan have concentrated on the effects of personal characteristics - marriage, childbirth, availability of child-care services and spousal incomes – on employment status. These factors are undeniably important; after all they are well-grounded theoretically and empirically. Any analysis needs to control for individual-level factors, such as marriage and the existence of children, in an investigation of transitions in female employment status.

In addition, we also investigate the factors specific to the industries to which the female workers' employers belong to. In particular, given the concerns voiced about microeconomic reforms, deregulation, changes in corporate governance, immigration, outsourcing, hollowing out and globalisation more generally, we pay specific attention to

each industry's degree of exposure to international competition and the consequent impact on the employment status of female workers. Previous research indicates that industries exposed to global competition tend to have more part-time employees than do purely domestic industries (Toyoda, 2005). Thus, those seeking jobs in more competitive tradable goods sectors have higher probabilities of getting part-time jobs compared to jobs in less competitive, non-tradable goods sectors. In addition, as we discuss below, full-time employees in more open industries could have higher probabilities of losing jobs, lower probabilities of re-employment or higher probabilities of becoming part-time employees or leaving the workforce altogether than counterpart workers in more competitively sheltered sectors.

The degree of 'outward orientation' for each industry is measured by import penetration (i.e., imports/total demand), export-orientation (i.e., exports/total demand) and foreign direct investment, FDI (i.e., nominal inward and outward FDI/nominal GDP). These data are contained in Appendix tables A2, A3 and A4. Obviously, the pattern of the import and export ratios varies across industries. In the manufacturing, mining and wholesale and retail trade industries, the import and export ratios have been increasing. In construction and utilities, both import and export ratios are almost zero, as they are for the government sector. In the transportation and communication sector, import penetration and export-orientation have been fluctuating and display no obvious trend. The FDI and import data indicate Japan's dependence on natural resources.

We also include data on industry growth rates. As we discuss further below, there is a widespread view that the low growth rates of the 1990s were in large measure responsible for some of the structural changes that took place in the Japanese labour market. These data appear in Appendix table A5. What is immediately obvious is the severity of the recession in the second half of the 1990s as well as the marked differences across industries in growth rates. One might anticipate that the combination of both of these factors would result in significant structural shifts and changing employment relationships. As we will see below, such an expectation is not borne out statistically.

2.3 Macroeconomic data and measuring globalisation. To control for the overall macroeconomic environment, we include data for the female unemployment rate to capture the effects of the economy-wide slow-down on female workers.

To assess the extent to which any country is more (or less) globalised at any particular point requires much more than employing data on flows of trade, migration or FDI. When a phenomenon like globalisation encompasses several aspects that taken together may have an effect greater than the sum of their constituent parts, it appears logical to assess these effects together. Composite indices provide an excellent way to accomplish this since they provide a single statistic on which comparisons can be based, without the confounding effects of variation at lower levels of aggregation.

The KOF index (Dreher *et al*., 2008) fits the bill; in the following, we simply label it as *KOF*. The index is derived 25 variables grouped into six 'sub-indices': actual flows of trade and investment, restrictions, variables measuring the degree of political integration, data quantifying the extent of personal contact with people living in foreign countries, data measuring trans-border flows of information and a proxy for cultural integration.

The sub-index on actual economic flows includes (economy-wide) data on trade, FDI and portfolio investment. Trade is measured as the sum of exports and imports and portfolio investment is the sum of assets and liabilities (all standardised by GDP). The KOF index includes the sum of gross inflows and outflows of FDI and the stocks of FDI (again, both standardised by GDP). While these variables are standard measures of globalisation, income payments to foreign nationals and capital are included to proxy the extent to which a country employs foreign labour and capital in its production processes.

The second sub-index includes restrictions on trade and capital using hidden import barriers, mean tariff rates, taxes on international trade (as a share of current revenue) and an index of capital controls. Given a certain level of trade, a country with higher revenues from tariffs is less globalised. To proxy restrictions on the capital account, data on 13 different types of capital controls are used.

The KOF has a sub-index on 'political globalisation', drawn from the number of embassies and high commissions in each country, the number of international organisations in which a country has membership and the number of United Nations peace missions participated in.

The remaining three sub indices of the KOF index concern 'social globalisation'; one on 'personal contacts', another on 'information flows', and a final one on 'cultural proximity'. The index on personal contacts includes international telecom traffic and the extent of tourism. Government and workers' transfers received (and paid) measure the extent to which countries interact, while the stock of foreign population is included to capture existing interactions with people from other countries. Finally, the average cost of a phone call to the United States measures the cost of international interaction.

While personal contact data are meant to capture interactions among people from different countries, the sub-index on information flows measures the potential flow of ideas and images. It includes the number of internet hosts and users, telephone mainlines, cable television subscribers, number of radios and sales of daily newspapers. Cultural proximity is arguably the dimension of globalisation most difficult to grasp. One indicator is the number of McDonald's restaurants located in a country. For many people, the global reach of McDonald's is symbolic of globalisation itself.

These dimensions are then combined into an overall index of globalisation with an objective statistical method.[1] Appendix table A6 reports the weights of the individual components.[2]

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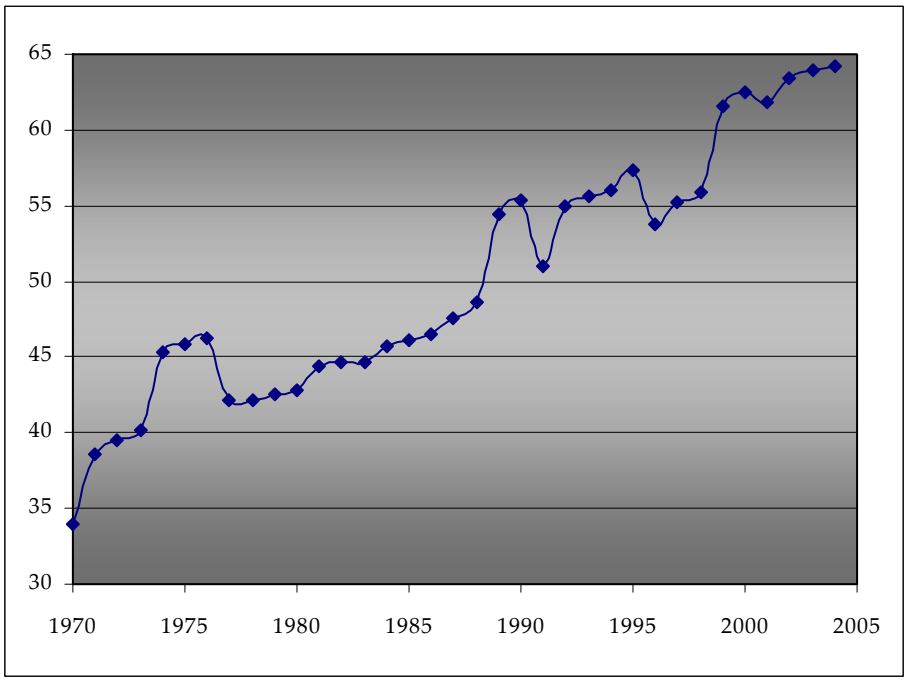
[1] Dreher *et al*. (2008) describe the statistical method in more detail. The annual data are available at: http://globalization.kof.ethz.ch/static/rawdata/globalization_2007_short.xls.

[2] To construct the indices of globalisation, each variable (in Appendix table A5) is converted into an index with a zero to ten scale. Higher values denote greater globalisation. When higher values of the original variable indicate greater globalisation, the formula $((V_i - V_{min})/(V_{max} - V_{min})*10)$ is used for transformation. Conversely, when higher values indicate less globalisation, the formula is $((V_{max} - V_i)/(V_{max} - V_{min})*10)$. The weights for the sub-indices are calculated using principal components analysis. The base year is 2000. For this year, the analysis partitions the variance of the variables used. The weights are then determined in a way that maximises the variation of the resulting principal component, so that the index captures the variation as fully as possible. If possible, the weights determined for the base year are then used to calculate the indices for each single year back to 1970. Where no data are available, the weights are re-adjusted. See Dreher *et al*. (2008) for further details.

Overall, since 1970 Japan has globalised. As Figure 1 illustrates, globalisation is not inexorable, there have been reverses, some of which occur in the sample period we are concerned with.[3]

Figure 1: The KOF Index of Globalisation for Japan, 1970-2005



2.4 Part-time employees in Japan. Before proceeding to our hypotheses and econometric analysis, we need to precisely define what it means to be a part-time employee in Japan, since it is somewhat different from other countries (see OECD, 2007). In Japan, there are essentially three definitions of part-time workers:

1) in accordance with international convention, the Ministry of Internal Affairs and Communications (MIAC) conducts the *Labour Force Survey*, which defines part-time workers as those working less than 35 hours a week;
2) MIAC also conducts the *Employment Status Survey*. Part-time workers are defined as employees in a particular workplace for whom the wage tables applied are substantially different to those for regular employees. In the *Survey*, part-time employees with the same hours of work, or possibly longer hours of work, compared to full-time employees are identified;
3) the Ministry of Health, Labour and Welfare conducts the *Survey of Employment Diversification*. Part-time employees are defined as those working fewer hours per day or fewer days per week than regular employees.

The definition of part-time employees used in the *JPSC* is 2).[4]

[3] Some of the large movements are readily explicable, e.g., outflows of FDI were enormous in the aftermath of the Plaza Accord, but then plummeted during the collapse of the Bubble economy.

[4] In the *JPSC*, apart from regular employees and part-time employees, dispatched employees (or temporary workers) and others are identified. However, the latter and other types of employees are excluded from the following analysis.

In Japanese firms, human resource management for part-time employees is completely different from that for full-time employees. First, the ports-of-entry for part-time employees are different. Usually, regular employees are carefully screened and chosen from new graduates during a designated recruitment period. Such workers are implicitly assumed to be long-term employees. According to the Japan Institute for Labour Policy and Training (JILPT, 2006), approximately 60 per cent of companies assign tests for general knowledge and academic proficiency and approximately 50 per cent perform vocational aptitude tests. On the other hand, part-time employees are generally selected from a pool of housewives and students without such careful scrutiny.

In addition, the average career paths for regular employees and part-time employees are quite different. Newly-hired regular employees undergo on-the-job training and gain a wide range of skills (Koike and Inoki, 2003). Unlike regular employees, part-time employees receive limited formal training, as they are not expected to climb career ladders within the firm's internal labour market. As mentioned, for regular employees, wages are mainly based on job grades and age. However, part-time employees' wage rates are often anchored to the outside labour market and may have little connection to a worker's previous experience.

Overall the Japanese labour market displays a dualism; a primary market characterised by relatively high wages, good working conditions, employment stability and the prospects of career advancement and a secondary market which tends to have low wages, poor working conditions, high turnover rates and little chance of advancement (Kishi, 2003). In Japan, while this perspective seems to be useful in understanding the coexistence of regular and part-time employee labour markets, there are still transitions from part-time to full-time and what is perceived in the current global environment to be increasingly common full-time work to part-time work transitions. This is our main concern in this paper.

2.5 Preceding analyses based on the JPSC. In the long period of stagnation following the collapse of the Bubble economy, the proportion of non-standard employees to total employment trended sharply upwards. At the same time, wage inequality and household income inequality became significant. This lead to a large number of research papers examining the effects of stagnation on labour market outcomes and wage distributions.

As for research papers using the *JPSC* data, there have been relatively few analyses of the changes in employment status and incomes as opposed to studies of the relationship between female labour force participation, marriage and childbirth.[5] This may be due to the fact that the rapid decline of birth rates in the last few decades attracted the attention of researchers more than the observed labour market outcomes during the 1990s. Among the analyses focussing on the relationship between business cycles and female employment status are Higuchi *et al.* (2003), Kitamura (2005) and Abe (2006). Higuchi *et al.* (2003) analyse the labour force status of *JPSC* respondents and find that the proportion of the

[5] Some researchers have pointed out that it is difficult for married women to work as regular employees. In addition, female regular employees tend to have fewer children than part-time employees. Other researchers argue that both Japanese employment practices and an insufficient supply of child-care services hinder married women from simultaneously working as regular employees and rearing children. See National Institute of Population and Social Security Research (2002), Shu (2003) and Yashiro (1998).

women who change their employment status from regular to part-time employment was higher for the generation that graduated from school at the beginning of the 1990s than for older cohorts. In addition, they report that the proportion of women who continue to work as regular workers after having children was higher for those who completed their education in the period shortly after 1985, when the *Equal Employment Opportunity Law* was implemented, than for other cohorts. Also, among those who were classified as '*freeters*' (i.e., young workers with tenuous labour market attachment), the proportion of part-time employees was higher, possibly due to the fact that these women were more likely to be single.

Kitamura (2005) finds that the proportion of those leaving the workforce was higher for younger cohorts who had been in their twenties during the 1990s than for the older cohorts. He also finds that younger women had lower annual incomes than older women since the younger workers were more likely to be part-time and other non-regular employees.

Abe (2006) finds that among the married women in the *JPSC*, cohort C respondents accounted for a higher proportion of part-time employees than those in cohort B, which in turn had a higher proportion of part-time employees than those in cohort A. He also compares the annual income distributions of women and their spouses in cohorts A, B and C and finds that couples in cohort C aged between 30 to 35 years had significantly lower minimum, median and maximum wages compared to couples in the same age bracket in cohorts A and B. Such income differentials are hypothesised to be brought about by changes in a labour market in which job openings for part-time employees increased and those for regular employees decreased.

Finally, the labour supply behaviour of married women has been analysed by a number of researchers. For example, Matsuura and Shigeno (2003) use multinominal logit estimation and find that for married women the choice to work full-time, part-time or to not work is quite different.

2.6 Hypotheses about labour market transitions. The above studies are certainly informative, but most of them do not look beyond the role of certain individual characteristics and the year of entering the labour market for understanding the impact on labour market transitions. In this paper, we are particularly interested in the role of globalisation and its impact on the growth of part-time employment. In part, this interest stems from our earlier work. A summary of the key findings in Gaston and Kishi (2007) is as follows. First, there is a relatively weak relationship between the hiring of part-time employees and economic activity. Secondly, the increase in the employment of part-time workers is unrelated to any broad capital-labour substitution. Thirdly, the hiring of part-time workers has been strongest in those firms that convert part-time jobs into full-time jobs, i.e., many Japanese firms use part-time work arrangements to screen workers for full-time positions. In other words, some workers *do* in fact make transitions to permanent, regular employment.

Finally, and important for the present paper, the growth of part-time employment is mainly accounted for by the wholesale trade, retail trade and service industries. In turn, the negative effect for tradable goods industries is related to international competition and outsourcing. In fact, the growth of employment at overseas affiliates is strongly positively correlated with the growth in part-time employment in Japan. In our earlier paper, we speculated that Japanese multinationals respond to bleak economic conditions at home by increasing employment overseas, rather than by hiring workers for their domestic

operations. In addition, domestic part-time workers, and lower productivity workers more generally, have been replaced by unskilled workers at overseas affiliates.

Our previous work leads us the first hypothesis. That is, that firms in more internationally-exposed sectors are the most likely to forego traditional life-time employment practices. As a corollary, while all firms were under financial pressure, firms in non-tradable goods sectors are better able to resist the need for more flexible work-place arrangements.

> *H_1 (International competition): Workers in internationally-exposed sectors were more likely to make transitions to part-time employment or to unemployment (or not in the labour force) than workers in non-tradable goods sectors. As a corollary, the transition probability to part-time employment in internationally-exposed sectors is higher than in other sectors.*

A related hypothesis is that firms resort to hiring part-time workers as a direct response to the economic slowdown. For example, Rebick (2005) argues that it has been the slower growth that has pushed Japanese firms to increasingly rely on part-time workers and other secondary labourers. This hypothesis is related to H_1, but it is not trade-related. Hence,

> *H_2 (Demand and cost-cutting): In sectors with lower product market demand, the transition to part-time work and to unemployment (or not in the labour force) is higher.*

Related to the hypotheses about fluctuations in labour market demand is an argument that relates to structural change. In nearly every OECD country, part-time and casual forms of employment have risen in the last decade. This is due to structural change more generally, but may be due to globalisation more specifically.

On the other hand, the negative economic developments that so concern interested spectators of Japan probably have far more to do with the bursting of the Bubble economy and the protracted economic downturn of the 1990s, rather than with globalisation per se. In fact, one weakness of much current research is the way in which the effects of the long slump and the effects of globalisation are often confounded. For example, a typical assertion is as follows "*globalisation has contributed to the country's unemployment woes*" (Nakamura *et al*., 2004, p.107); likewise, "*… globalisation of the world economy caused brutal competition across all areas of the Japanese economy and accelerated both domestic layoffs and the loss of many manufacturing and R&D jobs to FDI operations in Asia*." (Nakamura and Horiuchi, 2004, p.240). However, outsourcing has long been a characteristic of post-War Japan, and even an explicit part of the government's industrial policy, it is *not* a recent phenomenon. Naturally, the rapid growth of trade with China has had, and will continue to have, profound effects on all its trading partners, Japan included. But frankly, little persuasive evidence or systematic analysis is available which sheds any light on the precise effects of globalisation on labour market outcomes, such as the unemployment rate or economic growth as well as labour market transitions. Notwithstanding, our next hypothesis tests this common presumption.

> *H_3 (Globalisation): The transition to part-time work has increased over time, as Japan has globalised.*

Finally, we turn to the other hypotheses based on individual characteristics, which are largely motivated by the previous research summarised above. We simply list these with little further elaboration.

H4 (Individual characteristics): The transition from full-time work to part-time work for female workers is higher when they:

i. are younger (i.e., less specific human capital);
ii. have less human capital (i.e., less general human capital or formal education);
iii. have more children (i.e., higher opportunity cost of full-time work);
iv. get married (i.e., a cultural expectation).

In the next section, we test these hypotheses by presenting first the empirical strategy and then the results.

3. Methodology and results

3.1 The model. In order to test the hypotheses, we perform two kinds of estimation. First, we estimate the relative probability that an individual employed in a full-time job or a part-time job in the $(t-1)^{th}$ period changes their labour market status in the t^{th} period. Thus, the focus here is on the characteristics of the industry from which an industry moves. Secondly, in order to focus on characteristics of the industry to which an individual moves, we estimate the probability of the transition from full-time employment to part-time employment and vice versa. In both cases, the transition process is best approximated by a random-intercept proportional odds model.

3.1.1 The proportional odds model with three outcomes. The transitions from being in full-time employment to being in the three employment states — full time, part-time and housewives (or the unemployed) — are estimated using the proportional odds model as follows. The employment status of respondent *i* in the t^{th} period is y_{it} and is defined as

$$y_{it} = \begin{cases} 2, & \textit{if a housewife (or unemployed)}; \\ 1, & \textit{if a part-time employee}; \\ 0, & \textit{if a full-time employee}. \end{cases} \tag{1}$$

We specify the latent variable (y_{it}^*) underlying the outcome (y_{it}) as a linear function of the explanatory variables, X_{it-1}.[6] The model is written as

$$y_{it}^* = \beta' X_{it-1} + \varsigma_t + \varepsilon_{it}, \tag{2}$$

where ς_t is the random intercept which varies across individuals and ε_{it} is the error term. The continuous latent responses y_{it}^* in equation (2) are related to the ordinal outcomes y_{it} via the threshold levels κ_1 and κ_2 as follows

$$y_{it} = \begin{cases} 0, & \textit{if} \quad y_{it}^* \le \kappa_1 \\ 1, & \textit{if} \quad \kappa_1 < y_{it}^* \le \kappa_2 \\ 2, & \textit{if} \quad \kappa_2 < y_{it}^*. \end{cases} \tag{3}$$

The relationship between the three outcomes and the explanatory variables is

[6] Note that the lagged export and import ratios, FDI and GDP growth rates are used. Obviously, the sample consists of respondents who were working (part-time or full-time) in period (*t*-1); no industry-level data are available for non-working respondents for period (*t*-1).

$$\ln\left\{\frac{\Pr(y_{it} > s \mid X_{it-1}, \varsigma_t)}{1-\Pr(y_{it} > s \mid X_{it-1}, \varsigma_t)}\right\} = \beta' X_{it-1} + \varsigma_t - \kappa_s, \text{ where } \varsigma_{it} \mid X_{it-1} \sim N(0, \psi), \tag{4}$$

where s is either 1 or 2 and κ_s is the threshold level shown in equation (3).

We produce estimates using two different specifications of X_{it-1}. The first simply uses the industry dummies. This enables us to determine whether the industry to which a worker belonged matters for making transitions from either full-time or part-time work. The second replaces the industry dummies with industry openness characteristics. Unsurprisingly, we find that industry matters for labour market transitions. The hypotheses about openness are then tested using the second set of regressors. The explanatory variables are described in table 1.[7]

-- Table 1 here --

3.1.2 The random-intercept logistic model with two outcomes. In the previous sub-section, we assume that individuals have a choice of three types of employment status. Here, we assume that the j^{th} individual has just two choices in the t^{th} period, i.e., to be a part-time employee or a full-time employee. That is, the outcome in the t^{th} period, z_{jt}, is the following binary variable

$$z_{jt} = \begin{cases} 1, & \textit{to be a part} - \textit{time employee}; \\ 0, & \textit{to be a full} - \textit{time employee}. \end{cases} \tag{5}$$

We specify the latent variables (z_{it}^*) underlying the observed outcomes (z_{it}) as linear functions of the explanatory variables. Denoting W_{it} as an explanatory variable matrix, then the latent-response model is written as follows

$$z_{it}^* = \gamma' W_{jt} + \tau_t + u_{jt}, \tag{6}$$

where τ_t and u_{jt} are the unknown random intercept and the error term, respectively. The continuous latent responses z_{jt}^* are related to the observed outcomes z_{jt} via the threshold level λ as follows.

$$z_{jt} = \begin{cases} 0, & \textit{if} \quad z_{jt}^* \le \lambda; \\ 1, & \textit{if} \quad \lambda < z_{jt}^*. \end{cases} \tag{7}$$

The relationship between the outcomes and the explanatory variables is

$$ln\left\{\frac{\Pr(z_{jt} = 1 \mid W_{jt}, \tau_t)}{1-\Pr(z_{jt} = 1 \mid W_{jt}, \tau_t)}\right\} = \gamma' W_{jt} + \tau_t - \lambda, \text{ where } \tau_t \mid W_{jt} \sim N(0, \phi). \tag{8}$$

Note that equation (8) differs from equation (4) since contemporaneous values of all the variables are used. That is, this model estimates the effects of the 'destination' industry characteristics for job changers. As above, we use two different sets of explanatory variables and the STATA *gllamm* procedure is used.

[7] Equation (4) is estimated using the STATA *gllamm* (generalised linear latent and mixed models) procedure (see Rabe-Hesketh and Skrondal, 2008).

3.2 Econometric procedures and the descriptive statistics. First, we estimate the model described by equation (4). The data used for the estimation are from Waves 2 to 12 of the *JPSC*. The descriptive statistics for the data are given in Appendix table A7.[8] The most obvious feature is that more than half of the female workers in our sample are in the service and wholesale and retail trade industries.

The estimates using the industry dummies are contained in Appendix table A9. The omitted industry categories are government and utilities; industries which are essentially closed and purely domestic. In addition to the personal characteristics and the measure of globalisation, industry of affiliation is clearly important for labour market transitions from full-time work. Apart from the service and wholesale and retail trade industries, manufacturing is also important. Ignoring the mining industry, the latter two industries are the most open and internationally exposed. The wholesale and retail trade industries, where are large percentage of women in our sample work, have very high import penetration, export orientation and FDI. We turn next to an explicit consideration of these openness variables and the globalisation index.

-- Table 2 here --

First, consider panel *I* of table 2. As the model makes the proportional odds assumption, the odds ratio for being in a part-time job or not working at all compared to being in a full-time job is the same as the odds ratio for not working compared to being in a full-time or a part-time job.[9] Hence, the result for imports indicates that a one percentage point increase in import penetration of the industry to which a woman belonged in the $(t\text{-}1)^{th}$ period increases the odds ratio of leaving full-time work by 1.006 (=exp(0.006) and the odds ratio of not working at all by 1.006

As for the other industry-level variables, a one percentage point increase in the female unemployment rate increases the odds of not working by 1.576. On the other hand, an increase in the KOF index *increases* the odds of working; contrary to the usual concerns about globalisation.

As expected, marriage increases the two odds ratios, i.e., of not working versus being employed and of not working or working part-time compared to being in a full-time job. For married women, the odds of not working or working part-time as opposed to being in a full-time job is more than three times higher compared to unmarried women. The negative effect of the woman's age on the odds ratio of leaving full-time work highlights the importance of job tenure and work experience. Education also has the expected significant negative effect on the transition from full-time work.

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[8] In Japan, transitions from full-time to part-time employment 'usually' proceed as follows: full-time employment to job quit to part-time employment. Changes in employment status within a given establishment are still uncommon. However, we do not distinguish job changers from those workers changing employment status within the same workplace.

[9] Whereas a binary logistic regression models a single logit, the proportional odds model models several cumulative logits. Therefore, since our ordinal outcome has three levels (0, 1 and 2), two logits are modelled, one for each of the following cut-off points: 0 vs. 1, 2 and 0, 1 vs. 2. The proportional odds assumption means that the two logits are equal.

Next, consider the next two panels of table 2 where the estimates of the odds of leaving a full-time job or a part-time job are presented. There is a positive effect of age on the odds ratio of becoming a full-time employee rather than a part-time employee. The negative effect of age on the odds ratios for losing jobs or obtaining part-time work observed in panel *II* is consistent with results from earlier research (e.g., Kitamura, 2005 and Abe, 2006). Unsurprisingly, years of education have a negative effect on both the odds of being out of the labour force and of changing employment status from full-time to part-time.

Overall, the effects of openness characteristics of the 'origin' industries on the changes in employment status are important but less important than personal factors such as marriage and age. The latter finding, in particular, confirms the view that it was relatively uncommon for young, full-time employees to be retrenched in Japan even during the Lost Decade.

Next, we estimate the model in which full-time employees face only two outcomes, i.e., to work part-time or full-time, i.e., in the t^{th} period. The estimates are in table 3. The descriptive statistics for the data used to estimate equation (8) are given in Appendix table A8 and the results for the estimation with industry dummies are in table A10. The latter table once again reveals the importance of industry effects. Recall that one feature of this present procedure is that we now focus on the characteristics of a woman's *destination* industry, rather than her *origin* industry.

-- Table 3 here --

Panel *I* of table 3 indicates that the import penetration ratio of the industry to which the woman's employer belongs yields a positive effect on the odds ratio of becoming a part-time employee in the t^{th} period. A one percentage point increase in the import ratio increases the odds ratio of having a part-time job rather than a full-time job by 1.015. A one percentage point increase in the female unemployment rate increases the odds ratio of having a part-time job by 1.74. FDI increases the odds of the transition to part-time jobs, but globalisation lowers it.

The results of the personal characteristics are similar to those for table 2. In particular, the effects of being married are extremely strong. Comparing married women and unmarried women, the odds of becoming a part-time employee rather than a full-time employee are about thirteen times higher for married women. Panel *II* of table 3 demonstrates that FDI in the industry to which a woman belongs in the t^{th} period has a significant negative effect on the odds of changing employment status to full-time.

3.3 Summary. First, starting with H_4 *(Individual characteristics)* the results were generally highly supportive. Younger workers with less specific human capital or fewer years of general human capital or formal education are more likely to make transitions to part-time jobs. The effects of marriage are highly significant, and we conjecture mirrors, something idiosyncratically non-Western about Japanese society. Many Japanese women get married and leave full-time work. The only surprise is the somewhat ambiguous effects we found for the number of pre-school children. We are unwilling to provide any casual explanation here and this is a topic for further research.

The second hypothesis was concerned with the increased need to cut costs during the Lost Decade; H_2 *(Demand and cost-cutting).* Despite the presence of highly significant industry fixed effects on the probability of leaving full-time permanent work, these effects are not

attributable to industry-specific growth rates. That is, industry growth has no significant effect on the probability of leaving full-time employment. On the other hand, the impact of a higher female unemployment rate has the predicted effect. The state of the macro-economy matters, even if what happens at the industry level doesn't.

As for our main hypothesis: H_1 *(International competition)*, we find quite strong evidence that women in internationally-exposed sectors were more likely to make transitions to part-time employment *or* to exit the labour force compared to workers in non-tradable goods sectors. In addition, the transition probability of being in part-time employment in internationally-exposed sectors is higher than in other sectors. These results are apparent using both estimation methods. Our results reinforce the perception that the most open segments of the Japanese economy are the more likely to make the greater adjustment to their employment practices. A caveat to our findings is that, while the measures of international-exposure are often significant and have the hypothesised sign, they are not statistically significant in every model specification. In contrast, the effects of the industry dummies for internationally-exposed sectors, particularly that for the wholesale and retail trade industries, are strong and may reflect a time-invariant feature of employment practices in these industries.[10]

Finally, we tested H_3 *(Structural change and globalisation*). Is the spectre of globalisation really casting a dark shadow over the Japanese labour market? In Japan, as well as in most other countries, globalisation is blamed for every imaginable economic malaise. However, it seems that globalisation, at least as measured by the broadly-defined KOF index, is not the ominous factor operating on labour markets as is commonly thought, at least as far as the labour market transitions for female workers are concerned. Arguably, the opposite may very well be the case. In our view, globalisation may have actually served to offset some of the negative effects of the economic stagnation which affected all workers, part-time and full-time; male and female.

4. Discussion and concluding comments

Like nearly every other OECD country, Japan has experienced strong growth in part-time employment. In fact, the new jobs that Japan has added during its recovery from the Lost Decade have mainly been part-time jobs. Apart from some wistfulness about the capacity of the economy to once again generate high quality and high paying jobs, more practical concerns are normally raised about the low pay, poor training provisions, instability and general low quality of part-time jobs. The part-time jobs growth that Japan has experienced also raises questions about whether the new employees are, on average, less loyal and less productive than their predecessors, which might lower social efficiency and long-run growth.

This paper studied the labour market transitions of female workers for the period 1993 to 2004; a period of unprecedented economic stagnation for Japan. It provided an excellent, albeit salutary, setting to investigate how workers are affected and how firms have adjusted their workforces during such trying economic times. To achieve this purpose we used data

[10] Based on 2004 data, it should be noted that, among the ten industries covered by the *JPSC*, the wholesale and retail trade industries have the second highest import penetration (after mining); highest export orientation and second highest FDI (after mining).

from the Japanese Panel Data on Consumers (*JPSC*) to investigate the determinants of labour market transitions. In particular, we focussed on the transition from full-time to part-time work. While a number of the customary demographic and sociological determinants such as marital status, children in care and low levels of education are important, we also found that workers in trade-exposed industries were more likely to move to part-time jobs. The estimates in this paper indicate that firms in the most internationally-exposed sectors of the economy were the ones most under pressure to forego traditional life-time employment practices. In contrast, while all firms were under financial pressure during the economic slowdown, firms in non-tradable goods sectors seemed better able to resist the need for more flexible work-place arrangements. On the other hand, we found that the employment status in a previous period is important for what a person's employment status will be in the next period. The women most likely to remain unemployed, or to not find full-time work, are those not in the labour force. While this result may not be particularly surprising, what it points to is the fact that transition probabilities to permanent full-time employment are significantly higher from part-time employment (*cf.*, from unemployment). For reasons we are unable to completely fathom, this issue remains contentious in the literature, but the findings in this paper support the research done for other countries (see, e.g., Gaston and Timcke, 1999; Farber, 1999; Gaston and Kishi, 2005).

In contrast to the specific findings for trade-exposure, we find no evidence to support the commonly-made claim that globalisation is responsible for the changing nature of the Japanese employment relationship. In fact, globalisation may have been a saviour for female workers during the economic malaise of the 1990s in Japan. The growing integration of Japan into the world economy – as measured by an index capturing economic, social and political globalisation – has possibly softened the blow of a very severe recession. The rapid growth of ICT and high tech service sector industries, inwards FDI, financial sector liberalisation and political internationalisation offer Japan's workers full-time employment opportunities, they haven't destroyed them.

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Tables and Appendices

Table 1. Explanatory variables

Label	Definition
Export	(Exports/total demand) for industry to which respondent's employer belongs (%)
Import	(Imports/total demand) for industry to which respondent's employer belongs (%)
Growth	Growth rate of valued added for industry to which respondent's employer belongs (%)
KOF	KOF Index of Globalisation
FDI	(Foreign direct investment/gross value added) for industry to which the respondent's employer belongs (%)
UR	Female unemployment rate (%)
Married	Dummy = 1 if the respondent married; =0 otherwise
Age	Age in years
Education	Years of education (9 = junior high school, 12 = senior high school, 13 = technical school, 14 = junior college and technical college, 16 = university and 18 = higher education)
Kids	Number of children less than 6 years-old
Dummy variables for industry (reference category: government, utilities and others)	
Primary	Dummy=1 if the respondent is in the primary sector; =0 otherwise
Const	Dummy=1 if the respondent is in the construction sector; =0 otherwise
Manuf	Dummy=1 if the respondent is in the manufacturing sector; =0 otherwise
Wsale	Dummy=1 if the respondent is in the wholesale and retail sector; =0 otherwise
Transport	Dummy=1 if the respondent is in the transportation and communication sector; =0 otherwise
Service	Dummy=1 if the respondent is in the service sector; =0 otherwise

Table 2. Odds ratios of changing employment status (*origin* industry characteristics)

	I. From FT or PT jobs			*II. From FT jobs*			*III. From PT jobs*		
Explanatory variable	Estimated coefficient	z-value	Odds ratio	Estimated coefficient	z-value	Odds ratio	Estimated coefficient	z-value	Odds ratio
Export	0.016	0.16		0.036	2.13 **	1.037	-0.009	-0.65	
Import	0.006	1.68 *	1.006	0.098	1.50		-0.003	-0.59	
Growth	0.009	0.85		0.012	0.72		0.015	0.91	
KOF	-0.050	-2.27 **	0.951	-0.449	-1.30		-0.043	-1.23	
FDI	-0.014	-0.89		-0.033	-1.06		0.028	1.12	
Female unemployment rate	0.455	4.16 ***	1.576	0.478	2.89 ***	1.613	0.133	0.80	
Married	1.271	8.23 ***	3.564	0.626	3.91 ***	1.870	-1.000	-5.56 ***	0.368
Age	-0.014	-2.84 ***	0.986	-0.106	-5.63 ***	0.899	1.056	5.91 ***	2.875
Kids	-0.058	-0.88		-0.267	-2.25 **	0.766	0.358	3.70 ***	1.430
Years of education	-0.186	-3.66 ***	0.830	-0.250	-4.77 ***	0.799	0.059	1.13	
Fixed part: Thresholds									
κ_1	-3.993	-3.04 ***		-4.806	-2.76 ***		-0.459	-0.27	
κ_2	-0.619	-0.48		-4.340	-2.50 **		4.998	2.88	
Random part: variance									
ψ	9.568 (0.707)			1.625 (0.353)			1.601 (0.363)		
Log likelihood	-5054.079			-1658.720			-1877.264		
Number of level 1 units	7530			4470			3060		
Number of level 2 units	1450			928			812		
$\rho = \frac{\psi_{11}}{\psi_{11} + \pi^2/3}$ †	0.744			0.005			0.005		

Notes: Dependent variable for estimates in *I* and *II*: Odds ratios of y_{it}, 2 = NLF, 1 = PT, 0 = FT; dependent variable for estimates in *III*: Odds ratios of y_{it}, 2 = FT, 1 = PT, 0 = NLF. All explanatory variables are for the $(t\text{-}1)^{th}$ period. † Estimated interclass correlation for the latent responses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels.

Table 3. Odds ratios of changing employment status (*destination* industry characteristics)

	I. From FT, PT or NLF **(Dependent variable: Odds ratio of z_{jt}, PT = 1, FT = 0**			***II. From FT*** **(Dependent variable: Odds ratio of z_{jt}, PT = 1, FT = 0**			***III. From PT*** **(Dependent variable: Odds ratio of z_{jt}, FT = 1, PT = 0.**		
Explanatory variable	Estimated coefficient	z-value	Odds ratio	Estimated coefficient	z-value	Odds ratio	Estimated coefficient	z-value	Odds ratio
Export ratio	0.025	1.56		0.046	1.53		-0.022	-0.89	
Import ratio	0.015	2.33 **	1.015	0.023	1.79 *	1.023	0.004	0.33	
Industry growth rate	0.002	0.11		0.013	0.39		0.129	0.43	
KOF	-0.109	-3.43 ***	0.897	-0.016	-0.24		0.077	1.42	
FDI	0.119	4.22 ***	1.126	0.022	0.37		-0.154	-2.61 ***	0.857
Female unemployment rate	0.554	3.17 ***	1.740	0.813	2.32 **	2.255	-0.370	-1.31	
Married	2.562	13.33 ***	12.962	1.085	3.39 ***	2.959	-1.521	-5.20 ***	0.218
Age	0.113	4.50 ***	1.120	-0.071	-1.90 *	0.931	0.002	0.06	
Kids	0.220	1.77 *	1.246	-0.167	-0.72		0.314	1.70 *	1.369
Years of education	-0.781	-10.61 ***	0.458	-0.459	-4.44 ***	0.632	0.012	0.14	
Fixed part: Thresholds									
λ	-8.112	-5.07 ***		-0.129	-0.04		4.943	1.91 *	1.012
Random part: variance									
ϕ	14.146 (0.932)			7.276 (1.852)			3.133 (0.894)		
Log likelihood	-2412.724			-555.672			-645.387		
Number of level 1 units	7509			4150			2645		
Number of level 2 units	1425			856			636		
$\rho = \frac{\hat{\phi}_{11}}{\hat{\phi}_{11} + \pi^2/3}$ †	0.811			0.022			0.009		

Notes: Housewives and non-working persons are excluded; non-regular employees other than part-time employees are also excluded. † Estimated inter-class correlation for the latent responses. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels.

Table A1. The *JPSC* samples

Wave	Year	Cohort A	Cohort B	Cohort C
1	1993	1500 entrants (aged 24-34 years)		
2	1994	1422 respondents		
3	1995	1342 respondents		
4	1996	1298 respondents		
5	1997	1255 respondents	500 new entrants (aged 24-27 years)	
6	1998	1196 respondents	442 respondents	
7	1999	1137 respondents	412 respondents	
8	2000	1102 respondents	386 respondents	
9	2001	1059 respondents	366 respondents	
10	2002	1032 respondents	344 respondents	
11	2003	980 respondents	323 respondents	836 new entrants (aged 24-29 years)
12	2004	944 respondents	311 respondents	724 respondents

Table A2. Data on import penetration

Wave	1	2	3	4	5	6	7	8	9	10	11	12
Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
industry												
agriculture and fishery	9.6	9.5	9.0	10.8	11.0	9.8	8.7	8.6	9.0	9.1	9.5	10.0
mining	52.7	51.5	53.9	56.2	57.6	54.7	55.2	65.4	66.0	66.2	68.4	70.4
construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
manufsacturing	4.3	4.8	5.4	6.4	6.6	6.4	6.5	7.1	7.6	7.8	8.1	8.5
wholesale and retail	21.8	20.6	24.2	61.0	60.5	52.3	42.3	31.1	32.4	33.1	30.1	27.0
finance and insurance	0.6	0.6	0.5	1.1	1.1	1.3	0.5	0.3	0.4	0.5	0.6	0.6
transportation and communication	5.8	5.6	5.5	4.6	4.3	4.1	3.9	3.6	3.5	3.3	2.9	3.4
utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
services	1.7	1.8	2.0	2.5	2.6	2.6	2.1	2.1	2.3	2.4	2.1	2.2
government	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
average	3.7	3.8	4.2	5.0	4.8	4.5	4.4	4.8	5.0	5.1	5.3	5.7

Source: Cabinet Office (2007), *National Accounts for 2006.*
Notes: i) Imports are c.i.f.; ii) the figures for Finance and Insurance industry include data from the real estate industry.

Table A3. Data on export orientation

Wave	1	2	3	4	5	6	7	8	9	10	11	12
Yea r	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Industry												
Agriculture and Fishery	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.8	0.4	0.3	0.3
Mining	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manufacturing	9.1	9.3	9.0	9.7	10.6	11.2	10.9	11.5	11.1	12.2	12.6	13.5
Wholesale and retail trade	7.1	6.7	7.3	6.3	9.1	6.8	5.3	13.0	12.8	15.4	16.0	19.2
Finance and Insurance	0.3	0.8	0.3	0.9	0.7	0.6	0.3	0.4	0.3	0.3	0.4	0.6
Transportation and communication	9.4	8.9	8.0	8.0	8.0	8.2	6.9	7.1	7.3	7.4	7.9	8.9
Utilities	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Services	1.2	1.3	1.0	1.9	1.9	1.9	1.8	1.3	1.9	2.0	2.1	2.3
Government	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average	5.2	5.2	5.1	5.5	5.6	5.8	5.5	5.7	5.6	6.0	6.3	6.9

Source: Cabinet Office (2007), *National Accounts for 2006*.
Notes: i) Exports are f.o.b.; ii) the figures for finance and insurance industries include data from the real estate industry.

TableA4. Data on FDI

Wave	1	2	3	4	5	6	7	8	9	10	11	12
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture and fishery	0.2	0.4	0.2	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.3	0.1
Mining	11.4	5.7	12.0	20.4	40.7	15.2	15.7	11.3	9.1	7.4	34.1	45.9
Construction	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Manufacturing	1.2	1.5	1.7	2.2	2.2	1.7	5.1	1.9	2.0	2.6	2.2	1.5
Wholesale & Retail	9.9	7.9	7.7	9.1	7.9	8.9	11.1	9.7	6.5	10.5	13.0	4.6
Finance and Insurance	0.3	0.3	0.3	0.2	0.3	0.3	0.7	3.3	1.0	0.3	0.3	1.0
Transportation and Communication	0.8	0.8	0.6	0.6	0.8	0.8	2.0	9.7	3.1	1.1	0.9	2.7
Services	0.5	0.9	1.2	0.7	0.9	0.6	0.7	0.4	0.4	0.5	0.3	0.4
Total	0.9	0.9	1.0	1.2	1.3	1.2	1.9	1.6	1.2	1.3	1.2	1.5

Sources: Ministry of Finance (2008), Statistics on *Foreign Direct Investment*. Cabinet Office (2007), *National Accounts for 2006*.

Notes: i) Figures are for the ratio of nominal FDI (both inward and outward) and nominal GDP. The data for the finance and insurance include that for real estate. For the utilities and government sectors, FDI is zero.

Table A5. Data on the real growth rate of industry value added

Wave	1	2	3	4	5	6	7	8	9	10	11	12
Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Agriculture	-11.5	7.5	-4.7	1.5	-4.2	-1.6	-4.0	3.3	-4.4	5.7	-7.4	-13.7
Fishery	-3.7	-16.3	-17.1	5.2	-7.6	-17.2	0.9	-5.1	-5.2	6.4	-11.5	4.8
Mining	-9.0	-18.8	-4.7	7.1	-4.3	-5.1	-0.2	12.3	5.9	-3.0	2.5	-12.2
Construction	-0.1	-5.0	-7.1	-0.7	-1.2	-2.5	-1.5	-2.4	-2.6	-3.7	-2.0	5.7
Manufacturing	-3.7	-1.5	4.1	4.2	3.4	-5.9	1.7	7.2	-3.4	-2.6	9.6	10.1
Wholesale and retail trade	2.0	4.6	6.2	3.7	2.9	-3.1	-4.4	-3.0	0.8	-0.6	-1.5	1.5
Finance and insurance	4.1	7.7	4.2	-1.3	5.1	-1.6	4.6	2.4	7.6	3.8	3.4	1.9
Transportation and communication	1.8	2.5	3.5	1.0	4.7	2.4	-1.7	2.2	4.1	0.2	1.6	1.4
Utilities	-2.2	2.7	1.4	7.8	0.5	3.1	1.2	2.6	2.6	0.8	0.4	4.3
Services	1.8	0.1	2.2	5.8	2.2	3.9	1.3	3.6	1.1	0.4	1.7	1.2
Government	2.2	2.5	2.9	2.4	1.9	2.2	3.5	3.1	2.4	1.9	1.2	0.0
Average	0.2	0.8	2.2	3.2	2.4	-1.2	0.1	2.5	0.3	-0.3	2.7	3.4

Sources: Cabinet Office (2005), *National Accounts for 2004.* Cabinet Office (2007), *National Accounts for 2006.*

Notes: i) Figures for 2004 are obtained by multiplying the two series of the chain indices listed in *National Accounts for 2004* and *National Accounts for 2006*; ii) data for the finance and insurance industries include data for the real estate industry; iii) figures for the fishery industry are separate from those for agriculture and forestry industries for real value added.

Table A6. Components of the KOF index of globalisation

	Indices and Variables		Weights
A.	**Economic Globalisation**		**[36%]**
	i) Actual Flows		(50%)
		Trade (per cent of GDP)	(16%)
		FDI, flows (per cent of GDP)	(21%)
		FDI, stocks (per cent of GDP)	(23%)
		Portfolio investment (per cent of GDP)	(19%)
		Income payments to foreign nationals (per cent of GDP)	(22%)
	ii) Restrictions		(50%)
		Hidden import barriers	(24%)
		Mean tariff rate	(28%)
		Taxes on international trade (per cent of current revenue)	(28%)
		Capital account restrictions	(20%)
B.	**Social Globalisation**		**[38%]**
	i) Data on Personal Contact		(29%)
		Outgoing telephone traffic	(14%)
		Transfers (per cent of GDP)	(8%)
		International tourism	(27%)
		Foreign population (per cent of total population)	(25%)
		International letters (per capita)	(27%)
	ii) Data on Information Flows		(35%)
		Internet hosts (per 1,000 people)	(20%)
		Internet users (per 1,000 people)	(24%)
		Cable television (per 1,000 people)	(20%)
		Trade in newspapers (per cent of GDP)	(14%)
		Radios (per 1,000 people)	(23%)
	iii) Data on Cultural Proximity		(37%)
		Number of McDonald's restaurants (per capita)	(40%)
		Number of Ikea outlets (per capita)	(40%)
		Trade in books (per cent of GDP)	(20%)
C.	**Political Globalisation**		**[26%]**
		Embassies in country	(35%)
		Membership in international organisations	(36%)
		Participation in U.N. Security Council missions	(29%)

Source: Dreher *et al.* (2008).

Table A7.
Descriptive statistics for the estimation of equation (4)
(*origin* industry characteristics)

	From FT or PT jobs	
	Mean	Std. Dev.
Dependent variable:		
Employment outcomes:	NLF: 9.88% PT: 34.30% FT: 55.82%	
Explanatory variables(lagged):		
Export ratio (%)	4.861	5.025
Import ratio (%)	10.935	16.609
GDP growth rate (%)	1.419	3.282
KOF index	58.870	3.595
FDI (%)	2.937	3.913
Female unemployment rate (%)	3.950	0.807
Married	0.586	0.493
Age	32.567	4.986
Children below 6 years-old	0.317	0.622
Years of education	13.645	1.388
Industry dummies (lagged)		
Primary	0.014	0.116
Construction	0.045	0.208
Manufacturing	0.163	0.370
Wholesale and retail trade	0.230	0.421
Finance and insurance	0.084	0.277
Transportation machinery	0.026	0.160
Services	0.316	0.116

Note: *JPSC* data, 7,530 observations.

Table A8.
Descriptive statistics for the estimation of equation (8)
(*destination* industry characteristics)

	From FT, PT or NLF	
	Mean	Std. Dev.
Dependent variable:		
Employment outcomes	PT:42.60% FT:54.40%	
Explanatory variables:		
Export ratio (%)	5.186	5.389
Import ratio (%)	11.080	16.441
GDP growth rate (%)	1.532	3.388
KOF index	59.816	3.704
FDI ratio (%)	2.891	3.804
Female unemployment rate (%)	4.143	0.687
Married	0.617	0.486
Age	33.736	4.950
Children below 6 years old	0.298	0.604
Years of education	13.633	1.384
Industry dummies		
Primary	0.012	0.110
Construction	0.044	0.205
Manufacturing	0.161	0.368
Wholesale and retail trade	0.234	0.424
Finance and insurance	0.082	0.274
Transportation and communication	0.027	0.162
Services	0.318	0.466

Note: *JPSC* data; 7,509 observations.

Table A9. Odds ratios of changing employment status (*origin* industry characteristics)

	From FT or PT **Dependent variable: Odds ratios of y_{it}, NLF=2, PT = 1, FT = 0**		
	Estimated coefficient	*z-value*	*Odds ratio*
Primary sector	0.159	0.52	
Construction	-0.768	-0.28	
Manufacturing	0.475	2.60 ***	1.608
Wholesale and retail	0.563	3.49 ***	1.756
Finance and insurance	0.323	1.45	
Transportation and communication	0.256	0.96	
Services	0.561	3.56 ***	1.752
KOF	-0.064	-3.18 ***	0.938
Female unemployment rate	0.454	4.38 ***	1.575
Married	1.222	8.77 ***	3.394
Age	-0.032	-2.26 **	0.969
Kids	-0.067	-1.01	
Years of education	-0.174	-3.37 ***	0.840
Fixed part: Thresholds			
κ_1	-3.933	-3.20 ***	
κ_2	-0.553	-0.45	
Random part: variance			
ψ	9.394 (0.670)		
Log likelihood	-5044.937		
Number of level 1 units	7530		
Number of level 2 units	1450		
$\rho = \frac{\hat{\psi}_{11}}{\hat{\psi}_{11} + \pi^2/3}$	0.741		

Note: Omitted industries: government, utilities and others. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels.

Table A10. Odds ratios of changing employment status (*destination* industry characteristics)

	From FT **(Dependent variable: Odds ratios of z_{jt}, PT = 1, FT = 0.**		
	Estimated coefficient	***z-value***	***Odds ratio***
Primary sector	0.470	0.59	
Construction	-2.862	-6.53 ***	0.057
Manufacturing	0.222	0.62	
Wholesale and retail	1.785	5.65 ***	5.960
Finance and insurance	-2.167	-5.46 ***	0.115
Transportation and communication	-0.009	-0.02	
Services	0.270	0.89	
KOF	-0.133	-4.41 ***	0.875
Female unemployment rate	0.594	3.58 ***	1.811
Married	2.596	13.36 ***	13.410
Age	0.131	5.55 ***	1.140
Kids	0.167	1.32	
Years of education	-0.803	-11.15 ***	0.448
Fixed part: Thresholds			
λ	-9.178	-5.56	
Random part: variance			
ϕ	14.905 (1.016)		
Log likelihood	-2363.809		
Number of level 1 units	7509		
Number of level 2 units	1425		
$\rho = \frac{\hat{\phi}_{11}}{\hat{\phi}_{11} + \pi^2/3}$	0.809		

Note: Omitted industries: government, utilities and others. *, ** and *** denote statistical significance at the 10%, 5% and 1% levels.