

# Labour Market Risk Shifts in 18 Post-industrial Economies: An Application of Fuzzy-set Ideal Type Approach\*

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## ◀ Abstract ▶

The discussion of “new risks” in the field of social policy started to gain attention in the late 1990s and it is commonly argued that new risks are provoked by deindustrialization and/or globalization being more concentrated among the young, women and low skilled individuals. This study commences its inquiry with a conceptualization of labour market risk in an attempt to critically rethink the argument of new risk. A reevaluation of the concept is followed by an empirical investigation on the different types of risks and their changes by different degree. Eight-teen countries are selected in order to provide a comparative account to understand new risk. These are comparatively analyzed using the fuzzy-set ideal type approach to discover different types of social risks and to

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measure degrees of changes in relation to social risk. In sum, this paper aims to answer: what is new risk? and how do the characteristic of labour market risks differ in different post-industrial countries? The findings suggest that the types of risk are diverse and the speed or the directions of shift are also diverse.

Key words: new risk, fuzzy-set ideal types, post-industrial economy, non-standard employment, labour market risks

## 1. Introduction

The discussion on “new risk” started to gain attention in the discipline of social policy and welfare state research in the late 1990s (Huber and Stephens 2006, Esping-Andersen 1999, Pierson 2001, Iversen 2001, Taylor-Gooby 2000, 2004, Hacker 2004, Jenson 2004, Bonoli 2007). It is commonly suggested that new risks are provoked by deindustrialization and/or globalization. The argument posits that deindustrialization exerts pressure on the welfare state in various ways, translating into increased risk for different groups mostly arguing that new risks are more concentrated to mostly among young individuals, women and low skilled persons.

While it is worthy to highlight the contribution of the production of theories on new risk, literature on social risk seldom devotes itself to discussing the concept of new risk neither does it fully exploit scientific methods to dissect the concept of risk. Thus, the concept of new risk is often blurred and the distinctions between old and new risks become inevitably ambiguous, leading to a lack of sound empirical analysis.

This inquiry opens the discussion with a conceptualization of social risk with an attempt to critically rethink the argument of new risk. A lack of empirical evidence regarding new risk in the existing literature calls for an investigation of several advanced economies both from the global West, as well as the East. In this paper, we especially focus on risk in the labour

market. Hence, 18 countries are examined in order to ground a comparative perspective on the new risk in the labour market using the fuzzy-set qualitative analysis method (Ragin 2000, Ragin 2009) to measure the changes of risk in degree and in kind. In sum, this paper aims to answer two questions: 1) What is new risk? and 2) How are the characteristics of risk in labour market and the trajectories of risk shift differ in different countries?

## 2. Discussions of New Risk

Scholarly literature on “new risk” has focused on the increase of precarious work, tertiarization, destandardization or casualization of employment, increasing inequality, greater labour market flexibility, the weakening of labour unions and the fiscal burden on the welfare states that these social processes have produced. Globalization as one of the suggested causes of new risk is argued to increase inequality in wages and working conditions through greater labour market flexibility. Mishra also argues that globalization produces long term unemployment because it is untenable for countries to adopt Keynesian approaches to stimulate growth and job creation due to the relaxation and eventual abolition of government control over capital mobility (Mishra 1999). In his study of the social foundations of postindustrial economies, Esping-Andersen defines the post-industrialized economy as an economy with a labour market which has gone through a decline of the manufacturing industry (Esping-Andersen 1999). It is suggested that the expansion of the service sector replacing the manufacturing sector provided a high premium for skilled labour and educated people, while pushing low skilled workers in low value added, low wage jobs at the bottom of the wage structure (Kalleberg 2009, Krugman 1996). The emergence of new risk is brought on by the gap between provisions of postwar welfare states and the needs generated by this labour market transition (Esping-Andersen 1999; Pierson 2001, Bonoli 2007, Taylor-Gooby 2004).

Studies above have been successful in drawing attention to the appearance of what has been called new social risk, particularly in the field of social policy and welfare state analysis. However, the literature is characterized by some limitations. Firstly, just as a large share of the existing welfare state discussion has been largely focused on western countries, the new risk discussion which is built on the perquisite of western welfare state has been examining risks in western countries. The so called old risk such as old age and unemployment (Huber and Stephen 2006) can actually be more of an issue at present than before in some other countries such as East Asian countries. High unemployment rate was seldom witnessed in NIEs(newly industrialized economies) and the elderly were mostly taken care by family members, hence it is questionable whether high unemployment or old age can be categorized as old risk in East Asian welfare states as in Western countries where the welfare system developed in the earlier period. The literature on post-industrialization and new risk is based on studies focusing almost exclusively on advanced economies of Western welfare states and routinely excludes Asian post-industrial societies. Features of new risks in East Asian countries may be different or similar to the generally suggested new risks, indicating new implications for theory and empirically-grounded discussion. Hence, secondly, the body of scholarship on 'new risk' is less sensitive about the potential diversity and assumes an international convergence in the features of new risks without sufficient discussion on the potentially different characteristics or degrees of risk in different countries. To challenge this caveat, this study starts with a hypothesis that social risk is multidimensional and the characteristics of risk may vary in different post-industrial societies. Thirdly, analyses of new risk are still in a somewhat embryonic stage in the sense that most studies argue the emergence of new risk without fully exploiting comparative empirical evidence. An comparative empirical study on how new risks have emerged over time and whether they differ in degree with reference to empirical data can further develop the new risk discussion. In this paper, we commence this study by discussing on the concept of new risks referring to the literature above and continue our conceptualization and analysis especially focusing on risks in the labour markets.

### 3. Conceptualizing Social Risk

A critical review of previous discussion leads us to the question: what is risk and how can it be measured? Although some scholars have been successful in making a distinctive contribution to the discussion of concept in social science (Satori 2009, Goertz 2005), concepts are easily neglected partly due to the deep difference between quantitative and qualitative analysis. While qualitative researchers are concerned with concepts, their conceptualizations are often seen nonmathematical and deal with substantive issues. On the other hand, quantitative researchers have “focused on dealing with producing good quantitative measures” (Goertz 2005). Goertz argues that a concept involves both a theoretical and empirical analysis of the object or phenomenon.

The concept of social risk in this study also consists of two levels, the theory level and the empirical level. In the theory level, the essential characteristics of a concept are the necessary conditions for that concept. This level analyzes the necessary conditions that define a concept to be that concept. The necessary conditions which are considered as the essential attributes pin down the boundary of the concept. The second level of the conceptualization is the empirical level. It is the level where it is concrete enough to be operationalized by empirical data and indicators. However, each dimension should all satisfy the necessary conditions of the theory level.

Discussions of ‘risk’ are in fact not new and the concept has been widely used in various disciplines. Pinning down the boundary of the concept is important especially in order to combine the theoretical discussion with empirical analysis. This paper conceptualize risk to consist of two levels; the theoretical level and the empirical level. At the level of theory, what should be discussed are the essential characteristics that define risk to be a risk (Goertz 2005). This paper defines the concept of social risk to consist of three necessary conditions that make an event be a social risk (i.e. the essential characteristics of social risk): the threat to basic

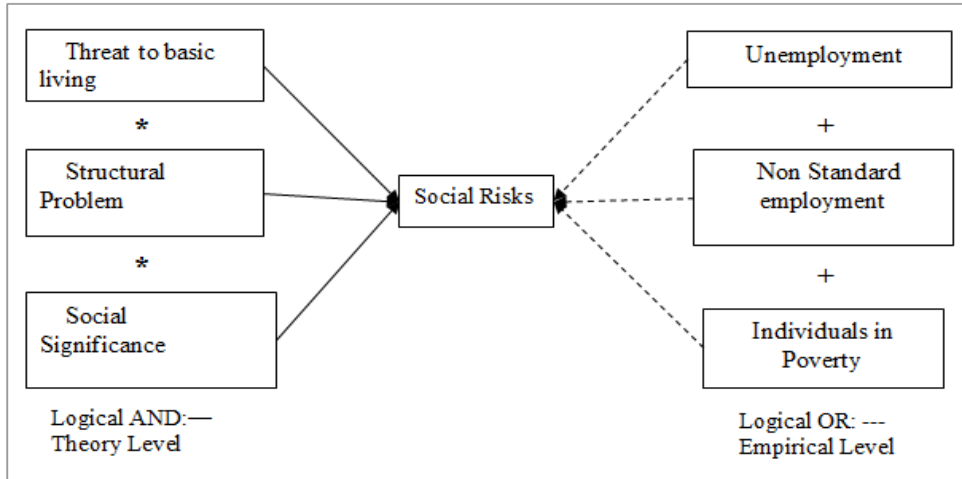
living, structural problem and social impact. These attributes are what mark the boundary of the concept of social risk and a phenomenon has to have all three characteristics to be defined as a social risk.

Threat to basic living refers to situations or an undesirable event that threatens individuals' standard economic level of living. In other words, falling into economic poverty is a risk for individuals as it is associated with the lack of material resources. In this study, economic poverty is related to poverty in the social context, understood through the concept of relative poverty. Theory suggests that as societies become more affluent, the standard economic level of living is also gradually adjusted upward and the level of standard living also becomes adjusted (Sen 1992; Townsend 1979). Normally, empirical studies or governmental databases adopt the definition of relative poverty as the percentage of persons living with incomes below 50 or 60 percent of the national median income.

Social impact refers to the risk that has an impact or influence in that society. The concept of social impact was theorized first psychologically by Latané (1981), but the concept developed to be more general and it is used to assess the consequences of policies, programs, projects and development etc. Here, this dimension of the theory level understanding of risk refers to a risk that is not confined just to individuals, but which has greater consequences for, influence or impact on substantial portions of society.

Structural problem refers to the kinds of risk that are manmade, but where the control of risk is beyond individual capacity. Social force or structural problem that is external to the individuals may affect, for instance, the increase in individuals' suicide rates. For the concept of social risk, unemployment due to economic recession, market failure and/or government failure can be a few among many examples. The negative pole (something that is not a structural problem) could be unemployment (either temporary or long-term) due to personal choice for various reasons.

[Figure 1] Conceptualization of Social Risk in the Labour market



This study confines social risk as the concept which satisfies all three necessary conditions and mathematically a logical AND is applied to pin down the boundary of social risk.<sup>1)</sup> That means that a social risk is a phenomenon that is a threat to basic living AND a structural problem AND has a social impact.

Once the essential characteristics for social risk are defined, we need to discuss the empirical aspects of social risks. This paper confines the analysis of new risks in the labour market and based on the previous discussion of new risk, empirical dimensions of social risk that are to be analyzed in this study are unemployment, non-standard employment and individuals in poverty. Each of these three dimensions of empirical level social risk satisfies the three theoretical conditions that qualify social phenomena as social risk. In other words, this level is structured by logical OR meaning that each dimension is a sufficient condition of social risk and each dimension is defined as social risk.

Unemployment is one indicator of social risk. The International Labour Organization defines “unemployed workers” as those who are currently not in paid work, but are willing and able to work for pay, currently available to work, and have actively been searching for work. It

1) In the fuzzy set method, “Logical AND (\*)” represents compound sets when two or more set are combined. The “logical OR(+)” refers to the unions of sets and it is expressed with summation in the equation.

has been widely discussed that unemployment increases individuals' susceptibility to malnutrition, illness, mental stress, loss of self-esteem and that long term unemployment may lead individuals to fall into economic poverty. Unemployment and/or long-term unemployment also have a cost for society: Dehesa and Snower (2006: 1) describe unemployment as "a colossal waste of human potential and national product; it is responsible for poverty and inequality". The literature explains that unemployment, at least in the West, was a cyclical phenomenon during the postwar industrial period. However, it is suggested that in the postindustrial period, long term unemployment has increased because the market for manufacturing is saturated and the demand has decreased (Iversen 2001). As far as the poorly skilled are concerned, it is harder for them to be employed in a society which provides high premium to the skilled and those in possession of knowledge. However, this argument is testable in the context of Asian countries, where youth employment is often unachievable even to those with high levels of education.

Non-standard employment refers to employment other than permanent salaried employment. The OECD defines non-standard workers as those who are temporary workers and part-time workers. In addition, temporary work includes work on fixed term contracts, temporary agency work, seasonal work and on call work. Non-standard employment is also precarious because of its informal employment arrangements. Many workers do not have a written contract specifying the terms and conditions for their employment and/or at best they have implicit contracts based on verbal agreements (Lee and Eyraud 2008). For example, the Republic of Korea reported that 39 percent of employees had no written employment contracts in the mid-2000s. (Lee and Yoo 2008). Furthermore, the OECD stated that in Japan and Korea, workers holding irregular jobs are paid between 40% and 60% less per hour than regular workers (OECD, 2008).

Individuals in poverty represent the third dimension of the empirical level understanding of social risk, which measures change in poverty. This dimension measures the change in relative poverty rate and also the ways in which poverty is distributed across society as a whole. Declining wages among low skilled workers and the increase of inequality over the past quar-



ter of century has been suggested to be the outcome of different socioeconomic changes (Blank, Danziger and Schoeni 2006). Huber and Stephens argue that the socioeconomic changes of the 1990s and early 2000s “increased the social groups at risk and/or increased the risk of a given social groups to fall into poverty” and suggested that the populations represented by less-educated working age persons, single mothers and young adults are the new social risk groups (Huber and Stephens 2006). Detailed explanation on the construction of property spaces in the fuzzy-set ideal type approach in this paper is continued in the following sections.

#### 4. Risk Shift and the fuzzy set ideal type approach

Returning our focus to ‘new’ in the risk discussion, in fact many of the suggested concepts of risks- inequality, precarious work, low wage, people under poverty lines, homeless people, working poor, unemployment, female poverty, elderly poverty etc - are in fact may not be very new. For example, unemployment, which is commonly suggested as an ‘old risk’ in the new risk literature (Huber and Stephen 2006), still prevails and inequality which is commonly suggested as ‘new risk’ in fact can be very old. These social risks have always been at the center of social policy or welfare discussions and it is questionable how new these social risks are. In this study, the concept of ‘risk shift’ is introduced and the concept of ‘new’ is tested. Rather than arguing the emergence of new risk, this study investigates the shift in the characteristics of labour market risk by kind and by degree.

The method of fuzzy set qualitative analysis which was introduced to by Ragin (2000) is employed to measure the ‘risk shift’. In this paper, two extended approaches of fuzzy set method are utilized, namely the configurational approach (Ragin 2000, Ragin 2009) and the ideal type approach (Kvist 1999, 2006). To make sense of the heterogeneity within the concept of labour market risk in an encompassing manner, diverse theories were engaged and

multiple aspects of risk were investigated above. This configurational approach allows us to examine different types of a same phenomenon, social risk. In other words, labour market risk is viewed as a configuration of the three dimensions (unemployment, non-standard employment and individuals in poverty) and 8 (23) types (configuration) of social risk are possible, which allow for the complexity of labour market risk.

The ideal type approach which is an extension of the configurational approach exploits the notion of fuzzy sets, establishing a degree of membership (Kvist 1999, 2006). In the fuzzy logic, the fuzzy truth represents membership in sets, which are defined by the researcher by establishing qualitative breakpoints of 1 and 0. Between these breakpoints, cases are given a fuzzy membership score, which is determined by the researcher as well and permits the scaling of the membership score and allows partial membership. Calibration<sup>2)</sup> itself is pertinent for comparative social research in many aspects as a researcher can compare qualitative concepts quantitatively (Ragin 2007). Logically 8 different ideal types of social risk can be generated and each case has a membership score for each type of social risk. However, the type with the highest membership score represents that the case is a member of that type of social risk. For example, Korea/1981 can have a membership score 0.3 for the ideal type U\*N\*P and 0.7 for u\*N\*P. Membership scores indicate that the case Korea/1981 is a u\*N\*P type rather than a U\*N\*P types because the membership score of u\*N\*P is higher than the U\*N\*P type.<sup>3)</sup> When calculating the membership scores of each ideal type, two rules of fuzzy sets method are applied: logical negation and minimum rule (Ragin 2007).

A case can logically have different fuzzy membership scores for different sets. A case can have a fuzzy membership value for the set U but can also have a fuzzy membership value for the set not-U (here represented as 'u') which is 1-U. For example, if Korea/1981's membership score for the set U is 0.3, its membership score for not-U is 0.7. This is called the rule of logical negation. The minimum rule is applied to calculate the membership scores for

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2) Calibration in fuzzy-set method is the membership scoring scheme. It is a standard developed by the researcher which makes measurement directly interpretable.

3) 'U' refers to high unemployment and 'u' is low unemployment. So for example 'u\*n\*p' would be a type that have low unemployment rate AND low non-standard employment rate AND low rate of individuals in poverty.

each ideal type which are a combination of three different dimensions (U and N and P). A case's membership score for each combinations which are formed by logical and (here represented by \*) is equal to the lowest score in any of the dimensions.). Hence, if the membership score for U, N, P is 0.4, 0.6 and 0.8 respectively, membership score of the configuration  $U*N*P$  is 0.4.

The analysis commences with examining risks in 18 OECD countries<sup>4)</sup> in order to investigate the how risks are shifting in a comparative perspective. The time span stretches from 1981 to 2007 with 8 time points. Each case (for example Korea/1981, Korea/2007, US/1981, etc.) is assigned a membership score for each empirical dimension of social risk and these dimensions compose 8 logical configurations, or social risk types. When interpreting the membership scores, the fuzzy set ideal type approach is utilized. Membership score 1 indicates that a case is fully in the ideal type of that dimension and membership score 0 indicates that a case is fully out of the ideal type. Cases also have membership scores between 0 and 1, and 0.5 is the crossover point for a case to be fairly in or out of the type. Sources of the original data are OECD data base, ILO labour statistics, European Labour Force survey, European household panel survey, National statistics bureau of Republic of Korea, National statistics bureau Japan, Hong Kong Special topic report and US Supplementary report to the labour force survey.

## 5. Analysis of Risk Shift in 18 countries

### 5.1 Unemployment

It is extremely difficult for any researcher or any policy maker to support their argument that a country has a high employment rate or a low employment rate. It is difficult because the as-

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4) Selected 18 countries are Rep. Korea, Japan, Hong Kong, Denmark, Sweden, Finland, Belgium, Netherlands, France, Germany, Austria, Greece, Portugal, Italy, Spain, United Kingdom, Ireland and the United States. Other NIEs such as Taiwan and Singapore are exclude for data unavailability.

sumed breakpoints for unemployment rate to be called high or low is profoundly qualitative. The strength of the fuzzy set approach is its ability to measure the changes in the unemployment rate not only quantitatively, but also qualitatively. Fuzzy set approach is qualitative as the breakpoints of fully in, fully out and the crossover point are decided by the researcher's substantive knowledge on both context and knowledge of the country cases under discussion. This involvement of the researcher in deciding the qualitative breakpoints are open to criticism for not properly translating data into appropriate membership scores. However, by being as transparent about the logics of the choices made as possible is one way to resolve such a challenge. The fuzzy set approach is also quantitative since the data is calibrated to measure the changes in degree once the breakpoints are established.

In fact for the dimensions of risk such as unemployment, empirical facts are profoundly important. In other words, an accumulation of empirical facts actually provides important information for understanding the case in its own context and it enables a researcher to make qualitative decisions within a comparative perspective. Therefore, we start by examining the unemployment rates in 18 OECD countries which have advanced economies from year 1981 to 2007. With some missing data, 475 cases are examined.

The mean for unemployment levels is 7.42 % and a standard deviation of 4.03. Giving more attention to cases, it is possible to notice that a few time points have unemployment rates that exceed 20 percent (the maximum being 23.88%) and these rates impact on the overall average. Cases with unemployment rates above 20 percent are mostly from Spain, an exceptional country in this sense. Also, Nordic countries show exceptionally high unemployment rates around the year 1993 compared to their unemployment levels in different time points. This indicates the impact of the financial crisis in Nordic countries in 1993. Ireland also had a high unemployment rate, above 15% in the mid-1990s, but this sharply decreased in the 2000s. Ireland transformed itself from an agricultural economy to a post-industrial economy of high technology and was referred to as the 'Celtic tiger' in the 1990s. Some of that transformation was made possible by generous EU structural funds, a system in place to reduce inequalities across the Member States of the European Union. In addition, a quite light

taxation regime was introduced to attract foreign companies. In contrast to the countries explored above, the average unemployment rate in the three Asian countries is 3.52%, which is substantially lower than the mean of the 18 countries reviewed here.

Plotting the frequency of each unemployment rate among 475 cases, most cases are concentrated to be under about 12 percent. Since one of the aims of this study was to examine closely the changes in the three Asian countries which have comparatively low unemployment rate (Korea, Japan and Hong Kong), we intentionally pay less attention to the countries that have had exceptionally high unemployment rates like Spain, the Nordic countries after the economic crisis, and also Ireland in 1980s to mid 1990s. In other words, it is less important to examine the degree of high unemployment when the cases already have an exceptionally high unemployment rate. With this intention and knowledge on cases, the breakpoint for a fully in high unemployment ideal type is set to be 11%<sup>5)</sup>. About 18 percent of the cases have higher rates than 11% and they have a membership score of 1, therefore. The lower 2 percent of all cases has an unemployment rate lower than 2% and these cases show very little variance. Considering Asian countries' low unemployment rates, the breakpoints for fully out of high unemployment ideal type, and membership score 0, is set to be 2%.<sup>6)</sup> Cases with unemployment rates between 2% and 11% are given continuous membership scores that are between 0 and 1. However, setting the 0.5 cross-over points that is based on qualitative knowledge of the case is challenging. Unlike other studies which employed ideal type approach to measure cases' conformity to the theory based ideal types, the concept of 'high' and 'low' unemployment can be developed highly dependent on other empirical parameters like average, median and distribution. Since case specific knowledge is engaged when setting the anchors of 1 and 0, the cross-over point was set at the middle point of each anchor with the justification that the frequency of rates is fairly distributed. Hence, the 0.5 crossover point is at 6.5% unemployment.

Membership score 1 indicates that a case is fully in the high unemployment ideal type and .5 is the breakpoint for a case to be considered a fairly high unemployment type. In other

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5) This is slightly lower than the sum of mean and standard deviation.

6) It is lower than the lower deviation of the mean of 18 countries, which is 3.39% (=7.42-4.03).

words, membership score ( $x$ ) indicates;  $x \leq 0$ : fully low unemployment rate,  $0 < x < .5$ : fairly low unemployment rate,  $.5 \leq x < 1$ : fairly high unemployment rate,  $1 \leq x$ : fully high unemployment rate.

The membership scores of the all three Asian countries are low in all time points showing no specific change. Austria is the only European country that has low membership scores in all time points. Finland and Sweden experience a rapid increase of unemployment rate from 1993 on, while the membership score falls after the mid-90s in Denmark and the Netherlands. The Southern European countries, Spain, Greece and Italy, are almost fully members of the high unemployment ideal type all throughout the analysed period. UK and Ireland have high membership scores until the late 1990s, but these drop rapidly, scoring around 0.2 in the 2000s. No general trends in the change of unemployment rate are examined, though some countries cluster into groups: three Asian countries, Southern European countries and Anglo-Saxon countries.<sup>7)</sup>

Unemployment is further examined by measuring how long-term unemployment rates have changed over time. The mean of the 426 cases (cases from 17 countries from 1981 to 2007 with missing data) is 3.14% and the standard deviation is 2.7. However, paying a closer attention to cases in the context rather than the descriptive statistics is required in order to make qualitative decisions. Spain and Ireland again stand out with their exceptionally high long-term unemployment rates until the late 1990s. The long-term unemployment rates in the rest of the countries vary from around 0% to 6%.

Similar to the observation made earlier, the calibration in this study does not intend to measure changes within the exceptionally high rates of unemployment. The long-term unemployment rate of Spain and Ireland are already high compared to other cases whether the rates are 15% or 10% or even 7%. Hence, a long-term unemployment rate that is higher than 6% is set as the criteria of fully high rate that is a fuzzy set score of 1. Two Asian states, the United States and Sweden show relatively low rates throughout all time periods, 1.5% being

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7) A table of a full fuzzy set membership scores of the set of high unemployment and raw data (and also fuzzy-set scores of the rest of the seven sets) can be obtained from the author by request.

the highest of all three countries. Attempting to include the variance of rates in these countries in the examination, long-term unemployment of 0.5% is set as a fuzzy-set score of 0.5, which essentially indicates that unemployment rates very near to 0% has a fuzzy set score of 0. Hong Kong is omitted due to the unavailability of the data.

Korea, Japan, the United States and Austria show small changes and have very low membership scores throughout all time points for long time unemployment. Although Finland experienced dramatic changes during the financial crisis, the membership score has fallen and together with that of other Nordic countries and thus they have fairly low membership scores. The Southern European countries have high membership scores throughout most of the time points, presenting no major changes, and this trend is similar in France and in Germany. However, the UK and Ireland show a change from fairly low long-term unemployment rates to high long-term unemployment rates from the late 1990s onwards.

## 5.2 Non-standard Employment

In this study, non-standard employment comprises temporary employment and part time employment as defined by the OECD, as well. Temporary employment rates and part-time employment rates are examined separately. In terms of part-time employment rates, full-time/part-time distinction in the main job is made on the basis of a spontaneous answer given by the respondent in most European countries. In Sweden, the Netherlands, the Republic of Korea and in Japan, part-time is determined on the basis of whether the usual hours worked are fewer than 35 per week or not. In the United States, part-time is determined by whether the usual hours worked are fewer than 30 hours. Data from all European countries has been retrieved from the European Labour Force Survey. Part-time employment rates for the Republic of Korea, US, Japan and Hong Kong are from each country's Labour Force database.

The mean of all cases is 15.27% and a standard deviation of 8.28. Carefully examining the

cases, the Netherlands stands out to have distinctively high part-time employment rates starting from the mid-1980s, ranging from around 26% to over 35%, while the rest of the cases vary between 4% to around 25%. Giving less attention to the Netherlands' case, with rates higher than 26% in all time points, the breakpoint for the fully in membership score is 26%. Hence any case over 26% part-time employment has a membership score of 1. As the variance in low part-time employment rate, less than 5%, is very small, 4.1% being the minimum. Therefore 5% or lower is considered to be fully out of the ideal type high part-time employment. The rest of the cases display fairly normal distributions around 15% and the crossover point for a case to be a member of fairly high part-time employment is thus 15%.

Distinctive from other Asian countries, only Japan became a country with high rates of part-time employment from the early 1990s onwards. Interestingly, all of the southern European countries have low membership scores while they had high membership scores for unemployment rates, including long-term unemployment. In a quite different vein, Denmark, Sweden and also Ireland, which had low membership scores for long-term unemployment, now have high membership scores for part-time employment rates. This indicates that low rates of long-term employment may have been possible because the part-time jobs absorbed that surplus of labour force. However, Denmark, the Netherlands and the UK show high membership scores throughout all time periods despite the changes from high to low in the membership scores for unemployment rates.

Next, temporary employment rates are examined. Employees with temporary contracts are those who declare themselves as having a fixed term employment contract or a job which will terminate if certain objective criteria are met, such as completion of an assignment or return of the employee who was temporarily replaced. For Hong Kong, casual employment consisting of employment on a day-to-day basis or for a fixed period of less than 60 days is considered temporary employment. Most European countries have full data sets regarding temporary employment from the 1980s onwards. However, data for Hong Kong and the United States are from special topic reports or a supplementary report, which provided temporary employment rates for 3 to 4 time points only.



Examining the cases, Spain and two Asian countries, the Republic of Korea and Japan, show exceptionally high rates compared to other cases. Temporary employment rates are around 30% for these countries, while other cases are fairly distributed between about 4% to around 22%. Hence the breakpoint for fully in the high temporary employment type is 22%, while 4% or lower is fully out and 13% is the crossover point for a case to be a member of fairly high temporary employment type.

Differing from the trend and patterns of membership scores for part-time employment, both Korea and Japan are fairly or fully in the high temporary employment ideal type, while Hong Kong is fully out throughout all its time points. All the three Anglo-Saxon countries have low membership scores throughout all time periods. However, membership scores of continental European countries, including the Netherlands, changed from low to high from around 2001. While all Southern European countries had low membership scores for part-time employment, patterns are diverse in terms of temporary employment. Spain is a high temporary employment type in all time points, while Italy joined the group of high temporary employment only since 2007.

### 5.3 Individuals in Poverty

'Individuals in poverty' is measured by two different indicators: Gini coefficient and relative poverty rate. The Gini coefficient is a measure of inequality in income distribution. The Gini coefficient in this study is taken from the OECD database without exception and refers to households' disposable income, except for the Republic of Korea. Here, the Gini coefficient represents governmental data and refers to urban households' disposable income. Considering the fact that more than 70% of the population lives in an urban area and noticing that the Gini coefficient recalculated by the government from 1990 is only slightly lower than the recalculated OECD comparable data, for Korea we use the Gini coefficient of urban household's disposable income for all available time points. Comparable Gini coefficients for

Hong Kong are unavailable, so Hong Kong is once more excluded from the analysis.

The distribution of Gini coefficients in the selected countries is normal in reference to the mean. However, the United States, the UK, Spain and Portugal have high Gini coefficients of over 35% in most time period. The break point for fully in the high inequality type is 35%, 22% or lower is fully out and 28.5%, which is the mean of both ends, marks the crossover point for a case to be a member of fairly high inequality group.

None of the Nordic countries show any significant change. In all time points their membership score is substantially lower than the crossover point. Often points are even fully out of the inequality type. Although higher, Netherlands, Austria and Germany have fairly low inequality in income distribution. All of the Southern European countries as well as the Anglo-Saxon countries have high membership scores indicating that they are in the high inequality type. Although there is a cluster of similar types, there are no significant changes of low to high or high to low in most of the countries. Interestingly, however, there is a substantial change in the Republic of Korea's membership scores from low to high from the late 1990s onwards.

Individuals in poverty as a dimension is measured by examining the relative poverty rates in each countries. Relative poverty rate refers to the rate of population living under 50% of the median income. A plot of the frequency of relative poverty rates shows that it is fairly distributed with two peak points. However, there are some cases of exceptionally high rates, relative poverty being over 16%. The US at different points in time stands out having particularly high relative poverty rates in all time points, around 17%. However, Sweden and the Netherlands in the 1980s had relative poverty rates that were even lower than 4%. The break point for fully in the high relative poverty type is 16%, 4% or lower is fully out and 10%, which is the mean of both ends, is the crossover point for a case to be a member of fairly high relative poverty type.

Likewise, the membership scores for the Gini coefficients, membership scores for relative poverty, presents clusters rather than a change over time. All of the Southern European countries as well as most of the Anglo-Saxon countries have high membership scores in ev-

ery time points except for the UK, which is fairly out of the high relative poverty ideal type in all time points. Nordic countries have very low membership scores and show almost no change over time. The Netherlands, France, Germany and Austria are also fairly out of the high relative poverty rate ideal type in all time points. However, there is a gradual increase in the membership scores in Austria and Germany. Next, the following section takes the analysis further to examine whether risk as a configuration has shifted in different trajectories.

## 6. Configurational Analysis

The fuzzy set method enables us to examine two modes of change: the change in type (difference in kind) and the change in the conformity to the ideal type (difference in degree). This study commenced with the question of whether there is diversity in the characteristics of risk and trajectories of risk shift especially focusing on risks in labour market.

First, the three dimensions of labour market risk were further divided into two: unemployment (unemployment and long-term unemployment), nonstandard employment (part-time employment and temporary employment), and individuals in poverty (Gini coefficient and relative poverty rate). Utilizing the concept of logical OR, the highest membership score among the two indicators for each dimension represents the membership score of the dimension. For example, the case Japan/1985 has membership score 0.44 for the part-time employment indicator and 0.76 for temporary unemployment. Since the nonstandard employment dimension can be represented by part-time employment rate OR temporary employment rate<sup>8)</sup>, the highest score which is 0.76 is the membership score of the nonstandard employment dimension for case Japan/1985.

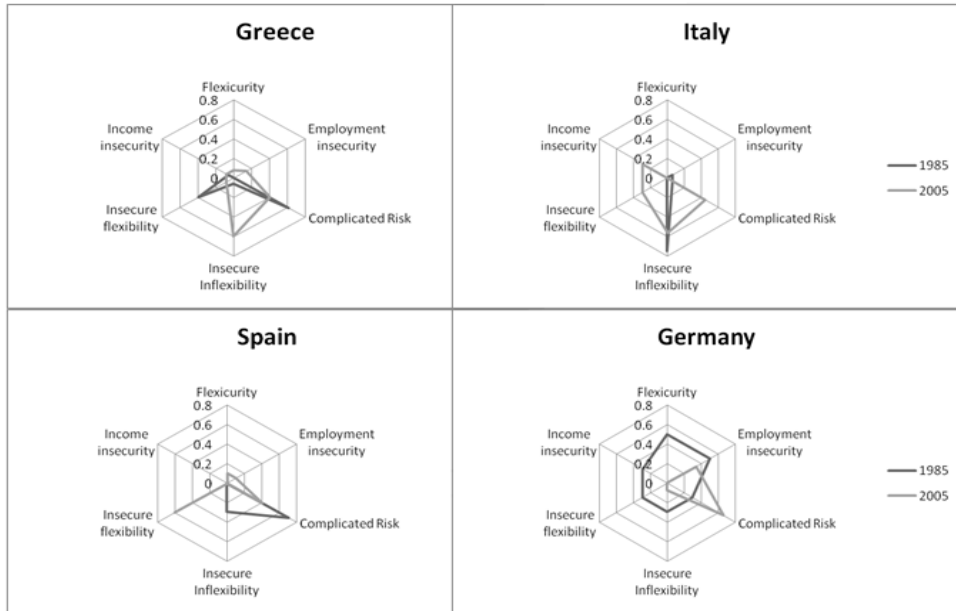
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8) The logical OR is operated here as either high part-time employment rate or temporary employment rate indicates that a case is a member of a high non-standard employment type.

Once the membership scores for each case in each dimension are assessed, risk as a combination of three dimensions is analyzed. Cases with membership scores that are higher than the crossover point (0.5) are fairly in the ideal type (high) and are presented with capital letters (U, N, P). Cases with membership scores lower than the crossover point is fairly out of the ideal type (low) presented with (u, n, p). For example, UK/1985 is U\*N\*P type, which indicates that the risk is a high unemployment, high nonstandard employment and high poverty type. The risk in Hong Kong/1989 is of a u\*n\*P type, which means that it is a low unemployment, low nonstandard employment but high poverty type. After eliminating cases which do not have membership scores for all three dimensions, the rest of the cases conformed to 6 ideal types (type U\*n\*p is neglected since it was only found once in West Germany/1989). Cases for the years 1981 and 2007 are omitted in the final table since less than half of the countries had complete combinations. Membership scores for unemployment rates and long-term unemployment rates show the same pattern, that is either both high or both low, in almost all cases except for the Nordic countries around the financial crisis.

Firstly, the change in type is examined. Contrary to the new risk argument, there is a divergence in the characteristics of risk. 6 different types of risk are found: Employment Insecurity (U\*N\*p), Flexicurity (u\*N\*p), Complicated Risk (U\*N\*P), Insecure Flexibility (u\*N\*P), Income Insecurity (u\*n\*P) and Insecure Inflexibility (U\*n\*P). Countries tend to cluster in groups while there is a weak evidence of a general shift in kind from one type to another. The Insecure inflexibility (U\*n\*P) type, which is a combination of high long-term unemployment, low nonstandard employment and high membership scores for individuals in poverty, occurs often. The risk is described as insecure because of the high membership score in the poverty dimension and high long-term unemployment without high nonstandard employment suggests an inflexible labour market. Italy is in this type and shows no shift in kind throughout the 20 years span. Risk in France, Italy and Ireland are all in the insecure inflexibility type as well until they start to diversify in the late 1990s.

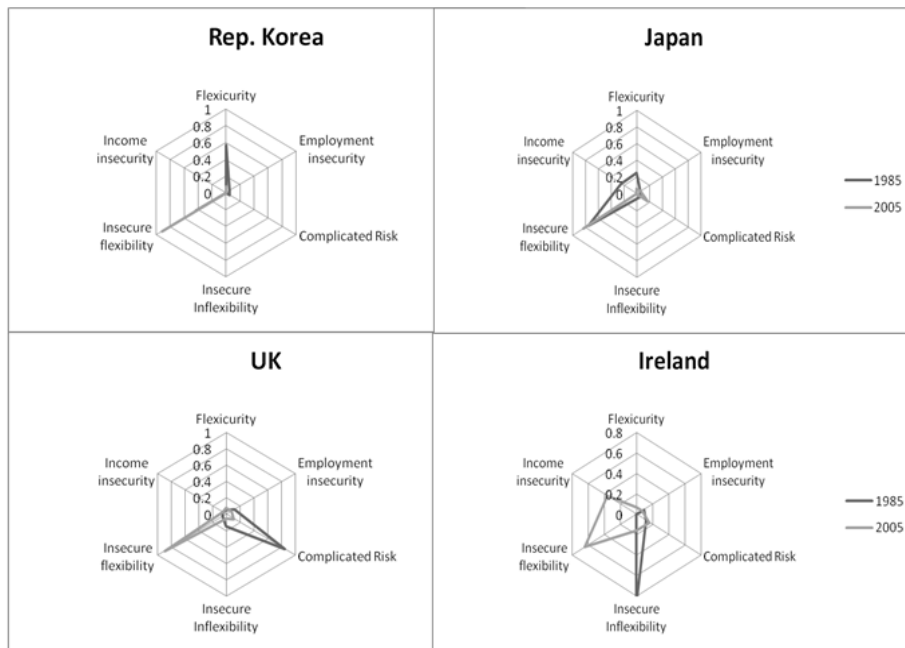
[Figure 2] Risk Shift between 1985 to 2005 in Greece, Spain, Italy, Germany



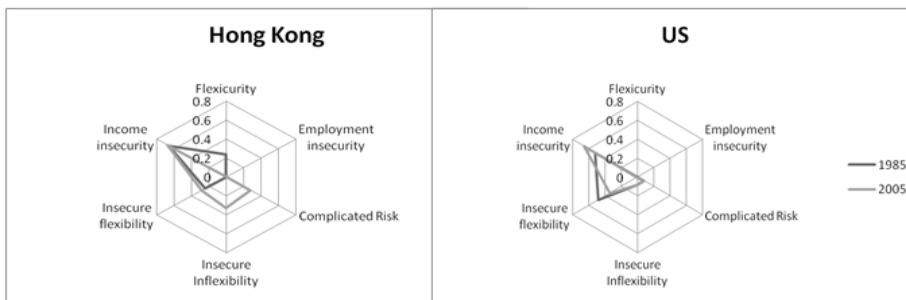
Spain is in the same type as Greece until the 1990s, i.e. complicated risk, which is a combination of high membership scores in all three dimensions, but shifts towards the insecure flexibility type from 2000s onwards. Greece, which was in the complicated risk (U\*N\*P) type, seems to follow the trend of Italy (U\*n\*P) after the 1990s and exhibit an inflexible labour market (figure 2).

In fact, the insecure flexibility type, which is a combination of low long-term unemployment, high nonstandard employment and high in relative poverty rate, occurs most often especially in the later period. Ireland, the UK, the Republic of Korea and Japan start to cluster from the late 1990s around the insecure flexibility type. The Republic of Korea and Japan show similarity throughout the 20 years period only in terms of having low long-term unemployment and high nonstandard employment. But from the late 1990s on, Korea joins the group of insecure flexibility as its relative poverty rates increase (figure 3).

[Figure 3] Risk Shift between 1985–2005 in Rep. Korea, Japan, UK, Ireland



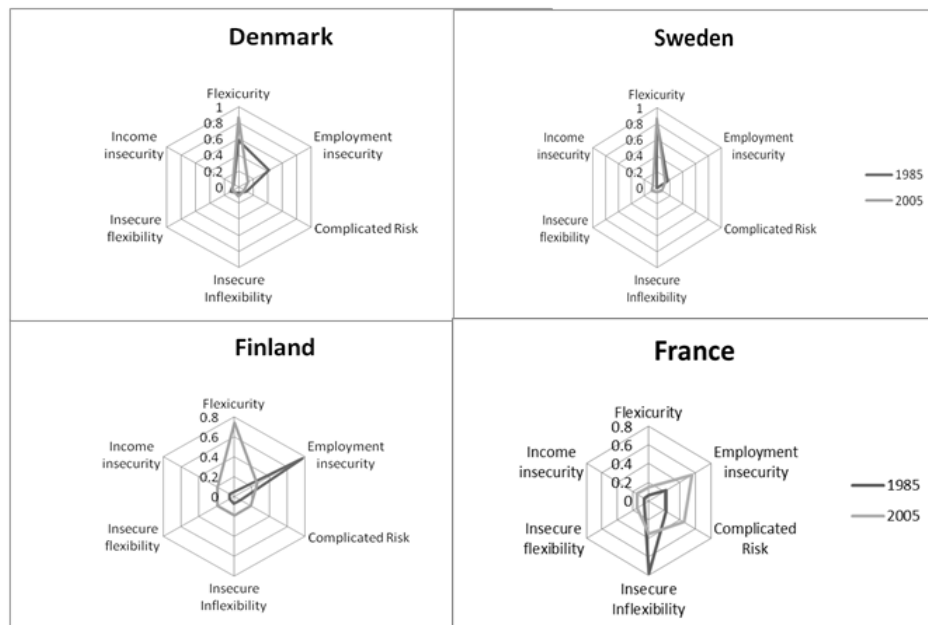
[Figure 4] Risk Shift between 1985 to 2005 in US and Hong Kong



The US and Hong Kong cluster as an income insecurity type ( $u^*n^*P$ ) without any shift to different kinds of risk (figure 4). Both countries have low membership scores for both long-term unemployment and non-standard employment, but very high membership scores for both relative poverty rates and inequality rates. Finland and the Netherlands are in the employment insecurity type ( $U^*N^*p$ ) before shifting to the flexicurity type ( $u^*N^*p$ ) after the late 1990s. However, both Denmark and Sweden conform to the flexicurity type throughout the

period (figure 5). The employment insecurity type is associated with both high long-term unemployment and high nonstandard employment rates, but low membership scores regarding poverty. This means that the security of being employed is low compared to the security from poverty. Germany is in this type until late 2000s and later shifts to the complicated risk type as its membership score for poverty increases. France shifts from insecure inflexibility to employment insecurity. As its non-standard employment rate increases, its membership scores for the poverty dimension decreases.

[Figure 5] Risk Shift between 1985 to 2005 in Denmark, Sweden and Finland (1997 and 2005 in Finland)



Interesting results are also found for the Scandinavian group and the Netherlands<sup>9)</sup>. The question of whether the concept of flexicurity is negative or positive is highly debatable, but here flexicurity appears as one of the 6 combinations. The flexicurity type refers to high flexibility in labour market while being comparatively secured from poverty (high rates of

<sup>9)</sup> While Netherlands presents similar trend with Finland but the figure omitted due to limitations in space for this paper. Please refer the table 1 for detailed fuzzy-set score.

non-standard employment, low rates of individuals in poverty). Denmark and Sweden belong to the flexicurity type without any shift during the given period and Finland together with the Netherlands joins the group of flexicurity type from the late 1990s onwards. As examined above, there are diverse trajectories for multiple configurations of risk and interesting clusters are found, such as US – Hong Kong and UK – Ireland clustering with Korea – Japan after the late 1990s.

[Table 1] Fuzzy-set membership scores of Labour Market Risk in 15 selected post-industrial countries from 1985 to 2005

|     | 1985         | 1989         | 1993         | 1997         | 2001         | 2005         |
|-----|--------------|--------------|--------------|--------------|--------------|--------------|
| DEK | u*N*p<br>.58 | u*N*p<br>.79 | u*N*p<br>.58 | u*N*p<br>.83 | u*N*p<br>.81 | u*N*p<br>.87 |
| SWE | -            | -            | u*N*p<br>.83 | u*N*p<br>.93 | u*N*p<br>.84 | u*N*p<br>.87 |
| FIN | -            | -            | U*N*p<br>.77 | U*N*p<br>.79 | u*N*p<br>.7  | u*N*p<br>.74 |
| NET | U*N*p<br>.8  | U*N*p<br>.63 | u*N*p<br>.53 | u*N*p<br>.63 | u*N*p<br>.61 | u*N*p<br>.67 |
| DEU | -            | U*n*p        | U*N*p<br>.51 | U*N*p<br>.67 | U*N*p<br>.6  | U*N*p<br>.66 |
| FRA | U*n*P<br>.75 | U*n*P<br>.66 | U*n*P<br>.58 | U*N*p<br>.55 | U*N*p<br>.53 | U*N*p<br>.55 |
| ITA | U*n*P<br>.75 | U*n*P<br>.75 | U*n*P<br>.87 | U*n*P<br>.85 | U*n*P<br>.77 | U*n*P<br>.56 |
| IRE | U*n*P<br>.88 | U*n*P<br>.82 | U*n*P<br>.78 | U*n*P<br>.7  | u*N*P<br>.61 | u*N*P<br>.64 |
| GRE | U*N*P<br>.61 | U*N*P<br>.71 | U*n*P<br>.71 | U*n*P<br>.69 | U*N*P<br>.54 | U*n*P<br>.6  |
| SPA | U*N*P<br>.71 | U*N*P<br>.7  | U*N*P<br>.94 | U*N*P<br>.95 | U*N*P<br>.79 | U*n*P<br>.6  |
| UK  | U*N*P<br>.85 | u*n*P<br>.53 | U*N*P<br>.83 | u*n*P<br>.55 | u*n*P<br>.85 | u*n*P<br>.89 |
| KOR | -            | u*N*p<br>.57 | u*N*p<br>.67 | u*N*P<br>.58 | u*N*P<br>.75 | u*N*P<br>.95 |
| JAP | u*N*P<br>.75 | u*N*P<br>.84 | u*N*P<br>.92 | u*N*P<br>.92 | u*N*P<br>.87 | u*N*P<br>.83 |
| US  | u*n*P<br>.52 | u*n*P<br>.55 | u*n*P<br>.52 | u*n*P<br>.61 | u*n*P<br>.66 | u*n*P<br>.66 |
| HK  | -            | u*n*P<br>.66 | u*n*P<br>.87 | u*n*P<br>.81 | u*n*P<br>.74 | u*n*P<br>.67 |



All countries conform to one or maximum three different types of risk and the degree of change within the same type of risk is also measured (see table 1)<sup>10</sup>. This enables us to compare different countries' membership scores that belong to the same type of risk. The risk in five countries, Spain, UK, Ireland, the Republic of Korea and Japan, exhibits the insecure flexibility type at least once. However, Ireland's and Spain's membership scores are not very high compared to the two Asian countries. Ireland's membership score of insecure inflexibility decreases gradually and the risk finally shifts to the insecure flexibility type. In a rather different way, Korea shows a rapid increase of membership scores in the insecure flexibility type, shifting from flexicurity type, while the membership score is gradually reduced in Japan. Korea's membership score of insecure flexicurity is the highest in all cases, which indicates that a shift is taking place with speed. The UK also shifts from the complicated risk type to the insecure flexibility type and its membership score for insecure flexibility is increasing. In terms of the flexicurity type, all three Scandinavian countries are in this type with membership scores over 0.7. Finland was highly in the employment insecurity type during the economic crisis, but immediately shifted to a flexicurity type in the later period. The Netherlands is fairly in the type together with the Scandinavian group, but its membership scores are lower than the Scandinavian countries. However, its membership scores of flexicurity type are increasing over time, which increases its conformity with the group. In case of US and Hong Kong, although they are both in the income insecurity type, the degree of change differs. The US' status in the income insecurity type strengthens, while Hong Kong's membership scores decrease in time. Complicated risk type occurs often in Spain and Greece. However, Spain's membership score increases as high as 0.95 in late 1990s but decreases afterwards and shift to the insecure flexibility type.

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10) Table 1 presents fuzzy-set scores of the selected 15 countries at 6 time points from 1985 to 2005.

## 7. Conclusion

This paper sets out with the question: “What is new risk and is it really ‘new’ rather than ‘old?’” In order to utilize the fuzzy set method that encompasses merits of both qualitative and quantitative analysis, a conceptualization of the labour market risk concept using set theory has been introduced. After a brief description of the method, three dimensions of risk in 18 countries post-industrial countries were examined between 1981 and 2007 in order to ground a comparative analysis. 6 types of risk have been found in 15 countries and its changes in degree and in kind have been measured.

The six different types of risk identified are the following: Employment insecurity (U\*N\*p), Flexicurity (u\*N\*p), Complicated risk (U\*N\*P), Insecure Flexibility (u\*N\*P), Income Insecurity (u\*n\*P) and Insecure Inflexibility (U\*n\*P). Also, countries conform to different types of risk and most countries tend to belong to certain types, suggesting a path dependency of risk shift. Social risk in Scandinavian countries and the Netherlands belong to the flexicurity type and the US – Hong Kong cluster together belongs to the income insecurity type. While Korea and Japan show similar trajectories, the UK and Ireland also cluster with these two Asian countries around the insecure flexibility type. The findings of diverse types of risk and diverse trajectories suggest an interesting implication: different welfare state systems, social policy or patterns of socioeconomic change may result in different kinds of risk even if countries are argued to be in a similar postindustrial stage. At the same time, findings also suggest that the process of post-industrialization is different in different countries. The investigation on the degree of change also indicates two conclusions. It attests that social risk shifts either belonging to the same type or gradually shifting to a different type. The other implication is that the speed of shift differs even when countries belong to the same type.

Finally, we return to the discussion of the issue of allegedly ‘new’ risk in postindustrial countries. The findings suggest that the types of risk are diverse and the speed or the directions of shift are also diverse. However, there is no evidence of an emergence of a uniform

new social risk in the labour markets of examined post-industrial countries. Empirical evidence from this study suggests that a country's type of risk has shifted or is shifting to another type. Post-industrial transition may have reinforced a certain type of risk, leading to changes in degree, or led to a different combination. This paper has investigated social risk in 18 countries to rethink the concept of new risk in post-industrial countries. This paper has its limitation in mainly focusing on labour market risks while giving less attention to increase of female workers and work-life balance discussion in the new risk literature. However, it contributes to the new risk discussion with its finding on diverse types and trajectories of risk and suggests a further inquiry on the cause factors that generates such differences. The finding suggests that institutional difference may be an important factor in explaining the various trajectories of risk shifts in post-industrial labour markets.

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## 퍼지셋 이상형분석을 활용한 노동시장위험의 변화양상 분석: 후기산업사회 18개국 대상 비교연구

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1990년 후반부터 사회정책 및 복지국가 연구에서 활발하게 논의되기 시작한 '신사회 위험' 연구는 일반적으로 탈산업화 또는 세계화의 영향으로 새로운 사회적 위험이 후기산업경제에 도래했다고 주장한다. 이러한 신사회적 위험은 또한 주로 청년층, 여성 그리고 저숙련자에게 집중되었다고 논의되고 있다. 본 연구에서는 먼저 신사회적 위험의 개념화작업을 통해 논의를 재검토하고 다른 유형의 사회적 위험들의 변화 양상을 실증적으로 분석하는데 특히 노동시장의 위험에 초점을 맞춘다. 이를 위해 후기산업경제 18개국을 대상으로, 퍼지셋 이상형분석을 실시하여 국가별로 노동시장 위험이 어떻게 서로 다르게 또는 비슷하게 변화하는지 비교분석한다. 구체적으로 본 논문의 연구문제는 다음과 같다; 1) 신사회적 위험은 무엇인가? 그리고 2) 각 국가에서 서로 다른 유형의 노동시장위험이 어떻게 서로 다른 속도와 정도의 차이를 보이며 변화하는가? 본 논문의 분석결과 후기산업경제의 국가들은 다양한 노동시장에서의 사회적 위험 유형을 경험하고 있으며, 그 유형의 변화 속도 및 정도의 차이 또한 다양하여 일반적으로 공통된 위험을 주장한 '신사회적위험'의 논의와 차이를 보였다. 본 연구는 퍼지셋 이상형분석을 활용한 실증적 비교연구를 실시하여 신사회위험 및 노동시장위험 논의에 기여한다.

**주제어:** 신사회적위험, 퍼지셋 이상형분석, 불안정노동, 후기산업사회, 노동시장 위험

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