

Welfare States' Policy Response to New Social Risk: Sequence Analysis for Welfare Policy*

JONGMIN YANG | SEOUL NATIONAL UNIVERSITY

This paper focuses on the trajectories of welfare state change through policy response to new social risks and methodologically categorizes the pattern of trajectories with sequence analysis. New social risks are the risks that people face in their life course due to the economic and social changes related to post-industrialization. By comparing a typology of welfare states based on trajectories of policy change in last three decades with Esping-Andersen's threefold typologies of welfare states, we can determine whether welfare states maintain their existing welfare systems or change them. The results of sequence analysis on social expenditures and total tax revenue show that welfare regimes undergo a substantial change. In particular, conservative welfare regime countries show various trajectories when reacting to new social risks. This finding empirically supports studies that assert the transformation of the welfare state.

Keywords: *Typology of Welfare State, Sequence Analysis, New Social Risk, Trajectory of Welfare State Change*

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Introduction

One of the main reasons why welfare states exist is to pool and redistribute social risks. A social risk could be defined as the probability that people experience a welfare loss during the course of their lives as a consequence of social and economic changes. Between 1945 and the mid-1970s, referred to as the 'golden age of the welfare state', social risks were efficiently and effectively managed by welfare states, together with other welfare providers, the labor market, and the family. In the labor market, full employment for male-breadwinners was possible because Keynesian demand management policy and the rapid productivity growth in the manufacturing industry guaranteed rising employment (Iversen and Wren 1998; Hemerijck 2012). Women in the family took a pivotal role in caring for young children and the elderly. As a consequence, the risk of unemployment and old age, the main social risk factors at that time, were effectively managed through workers' stable contribution to social security and women's significant care role.

Since the 1980s, however, the labor market and family structure have seen substantial changes, weakening their role as a welfare provider. As economies become more service-orientated, workers who lose their jobs in the manufacturing sector find it difficult to secure other jobs because of the decline in productivity (Baumol 1967). This process has resulted in mass unemployment. Furthermore, liberalization of the labor market has transformed much of the standardized employment into de-standardized employment such as fixed-term or part-time work. And in some continental European states it has resulted in dualization of the labor market; the division between insiders who receive full welfare benefits on the basis of full time employment, and outsiders who don't. Family structure has changed because of the rapid rise of female participation in the labor market, which makes it hard to balance paid work with caring for young children and the elderly. Consequently, as the labor market and family structure has become insecure, the characteristics of social risks have been transformed, and many researchers now employ the term 'new social risks' to express this (cf. Taylor-Gooby 2004; Bonoli 2007).

Faced with new social risks, welfare states inevitably recalibrate their focus on welfare policy. First, targeted social policies have to be implemented such as the Active Labor Market Policy (ALMP) which enhances the

employment and social services that provide support for dual-earner families. Second, since expenditures on “old” social risks such as pension and health services necessarily increase due to demographic ageing, welfare states have to expand the total amount of welfare spending in order to manage both old and new social risks. However, in order to achieve this, welfare states need sufficient financing; and when de-standardized employment becomes prevalent, this is much harder to secure through the social contribution of those in stable employment. Instead, it is necessary for welfare states to reform the tax system and use this as an alternative resource.

For three decades, therefore, welfare states have been under pressure to change their existing welfare system. In this context, considering the trajectories of policy responses to new social risks, it is worthwhile scrutinizing whether three worlds of welfare capitalism suggested by Esping-Andersen (1990, 1999), a paradigmatic typology of welfare states (Arts and Gelissen 2010), remains relevant. By comparing a typology of welfare states based on trajectories of policy change in last three decades with Esping-Andersen's threefold typology of welfare states, we can investigate whether states maintain their existing welfare systems (i.e., path-dependent) or change them (i.e., path-breaking).

Methodologically, sequence analysis is used to measure trajectories of policy change. The term sequence analysis refers to “a body of questions about social processes and a collection of analytical techniques designed to address them” (MacIndoe and Abbott 2009, p. 387). Sequence analysis supplements predominant methodologies for welfare state research: comparative and historical analysis, cluster analysis and pooled time-series cross-sectional analysis or panel data analysis (Amenta and Hicks 2010). Comparative and historical analysis has the advantage of comparing the change of policy or institution soundly within the same welfare regime or political system. However, generally only a few cases can be included since it requires a deep level of knowledge for each case. Cluster analysis permits analytical parsimony and helps to find underlying connecting logic. However, it does not easily capture change (Esping-Andersen 1999, p. 73). Panel data or pooled time-series cross-sectional analysis solves the problem of representativeness and enables hypothesis testing, but it is hard to descriptively show whole trajectories for policies or institutional change using this method. Sequence analysis, however, detects the trajectories of policy or institutional change very well and maintains each country's traits by categorizing the pattern of welfare state change. In other words, sequence analysis could be a ‘supplement’ to existing research methods rather than an alternative to them.

Ultimately, the main idea of this paper is to examine whether trajectories of policy change in response to new social risks are path-dependent or path-breaking. We methodologically categorize the pattern of trajectories through sequence analysis. The outline of this study is as follows: section 2 defines and compares new and old social risks, and describes the level of change. Section 3 discusses the typologies of welfare states research and explains why an alternative typology based on sequence analysis is needed. Section 4 describes the data and research methodology, and the results of sequence analysis are discussed in Section 5. Section 6 concludes the study by drawing out the implications of the results.

What are new social risks?

Taylor-Gooby (2004, pp. 2-3) defines new social risks as “the risks that people now face in the course of their lives as a result of the economic and social changes associated with the transition to a post-industrial society.” In the same manner, Bonoli (2007) also suggests that new social risks are related to socioeconomic transformations under postindustrialization. What, then, is the difference between old and new social risks? As shown in table 1, old social risks are related to industrialization and derived from reduced earning capacity due to old age, sickness or unemployment (Huber and Stephens 2007). The main risk target is the male-breadwinner and the main social policy for the alleviation of its effects is some form of income maintenance such as pensions or unemployment benefit schemes. New social risks, on the other hand, are related to postindustrialization and derived from risks such as mass unemployment of low-skilled employees due to a transition from a manufacturing to a service economy combined with dualization of the labor market owing to liberalization (Emmenegger et al. 2011). Increased instability in the family is also a significant new risk, as the care of young children and the elderly is disrupted by the massive entry of women into the labor market (Bonoli 2007). People most susceptible are those in the earlier stages of their lives (Taylor-Gooby 2004), women, and low-skilled people (Bonoli 2007). Social policies aimed at relieving new social risks include ALMP for enhancing employment and social services for supporting dual-earner families caring for the young and/or elderly.

To figure out the level of new social risks in OECD countries, four indicators are presented in table 2. The first indicator is part-time employment. Whilst those countries classified by Esping-Andersen as social

TABLE 1
COMPARISON BETWEEN OLD AND NEW SOCIAL RISKS

| | Old Social Risks | New Social Risk |
|---------|--|--|
| Cause | Industrialization | Postindustrialization |
| Content | Risks from deprivation of earnings capacity owing to old age, unemployment, sickness, and invalidity (Huber and Stephens 2006) | Mass unemployment of low-skilled Employees due to transition from manufacture to service economy, and dualization of the labor market owing to liberalization (Emmenegger et al. 2011). Increased instability of the family as care for young children and the elderly is disrupted by the massive entry of women into the labor market (Bonoli 2007). |
| Target | Male-breadwinner | People in early stages of their lives (Taylor-Gooby 2004), women, and low-skilled people (Bonoli 2007). |
| Policy | Income maintenance such as pensions and unemployment benefits | ALMP for enhancing employment, social services which provide care services for dual-earner families. |

democracies (discussed in detail in the following section) saw significant increases in part-time employment in the 1980s, in most conservative and liberal countries this increased after the 1980s. In particular, countries such as Austria, Belgium, Germany, the Netherlands, Australia, and Ireland all experienced a dramatic rise. Next we have long-term unemployment (continuous periods of unemployment of a year or longer). Whilst this has increased in Sweden and Norway, it has significantly decreased in Denmark owing to flexicurity¹. In conservative regime countries, there are wide variations; Belgium, the Netherlands, and Spain have notably reduced it while Japan, Switzerland, and Greece have not. Most liberal regimes, with the exception of Canada and the United States, have curtailed long-term unemployment. Female employment is the third indicator. High numbers of women in social democratic and liberal regime countries have participated in the labor market since the 1980s, whereas, in spite of an increase, southern European countries still maintain low rates of female employment. With regards to the final indicator, age dependency ratio (defined as the ratio of

¹ Flexicurity refers to “flexible labor markets, generous unemployment benefits, and active labor market policies, so as to reduce unemployment and improve the quality and supply of workers to the labor market.” (Hemerijck 2013, p. 29)

people older than 64 to those ages between 15 and 64), social democratic regime countries and continental European countries experienced a demographic ageing in the 1980s, and there was a substantial increase in the age dependency ratio for Japan, Italy, and Portugal.

At first glance, the level of new social risks is different between welfare regimes, just as Bonoli (2007) suggested. However, there is high variance between countries with the same category of welfare regime. Furthermore, welfare policy in response to new social risks could vary according to socioeconomic and political circumstances. Therefore, we should be cautious about drawing a direct link between welfare regime and welfare policy in response to new social risks. Instead, by considering the trajectories of welfare policy over the past thirty years, it is possible to categorize welfare regime in another way.

Typology of welfare states

Why do we need to categorize welfare states? Above all, a research method of typology “helps to arrange the observable empirical “mess” of phenomena into a more ordered, transparent, and therefore comprehensible manner (Van Kersbergen and Vis 2013, p. 59).” Furthermore, we can identify the underlying connecting logic of social phenomena and even generate and test hypotheses (Esping-Andersen, 1999). There has been an abundance of research into categorizing welfare states since Esping-Andersen (1990) published his outstanding book *The Three Worlds of Welfare Capitalism*. Van Kersbergen and Vis (2013, p. 53) describes the meaning of his work. Esping-Andersen helped move research beyond the prevailing preoccupation with using social expenditure as the primary indicator of welfare generosity. He showed the importance of systematic comparative research based on qualitative indicators such as decommodification and stratification. And on the basis of his typology of welfare regimes, he showed how these regimes are systematically connected with social outcomes such as labor market behavior. In short, Esping-Andersen reconceptualizes welfare states as welfare regimes.

Three concepts are central to his analysis: decommodification, stratification and welfare mix. Decommodification means that welfare benefits are rendered as a matter of right and that an individual can maintain a livelihood without relying on the market, stratification refers to the difference or inequality between groups who obtain welfare benefits (Esping-Andersen, 1990, pp. 22-3), and welfare mix directs our attention to which

TABLE 2
SELECTED STATISTICS RELATING TO NEW SOCIAL RISKS, OECD COUNTRIES, 1980-2009

| | Labor Market | | | | Family | | | | |
|-------------|----------------------|------|------------------------|------|-------------------|------|----------------------|------|--------|
| | Part-time Employment | | Long-term Unemployment | | Female Employment | | Age Dependency Ratio | | |
| | 1980 ^a | 2009 | 1980 ^b | 2009 | 1980 ^c | 2009 | 1980 | 2009 | Δ80-09 |
| <i>SDR</i> | 20.4 | 22.7 | 20.4 | 11.6 | 66.1 | 71.3 | 22.2 | 24.9 | 2.7 |
| Sweden | 24.2 | 24.2 | 5.5 | 12.8 | 73.3 | 70.2 | 25.4 | 27.4 | 2.0 |
| Denmark | 23.8 | 25.7 | 44.3 | 9.5 | 64.3 | 72.7 | 22.3 | 24.5 | 2.2 |
| Finland | 6.7 | 14.0 | 27.0 | 16.6 | 66.1 | 67.9 | 17.7 | 25.4 | 7.7 |
| Norway | 27.1 | 26.9 | 4.8 | 7.7 | 60.8 | 74.4 | 23.4 | 22.3 | -1.1 |
| <i>CR</i> | 10.5 | 20.4 | 41.1 | 34.8 | 44.5 | 60.1 | 19.9 | 27.5 | 7.5 |
| Austria | 7.0 | 24.6 | 18.4 | 21.3 | 58.9 | 66.4 | 24.0 | 25.9 | 1.9 |
| Belgium | 8.0 | 23.3 | 64.8 | 44.2 | 36.4 | 56.0 | 21.7 | 25.9 | 4.2 |
| France | 9.6 | 17.3 | 41.3 | 35.2 | 50.5 | 59.8 | 21.9 | 25.8 | 3.9 |
| Germany | 12.6 | 25.8 | 41.6 | 45.5 | 49.6 | 65.2 | 23.4 | 31.5 | 8.1 |
| Netherlands | 18.7 | 34.8 | 48.8 | 24.8 | 34.2 | 69.6 | 17.4 | 22.6 | 5.2 |
| Japan | n/a | n/a | 16.5 | 28.5 | 51.4 | 59.8 | 13.5 | 35.6 | 22.1 |
| Switzerland | 25.4 | 33.6 | 17.0 | 30.1 | 66.5 | 73.6 | 7.1 | 20.8 | 3.7 |
| Greece | 6.4 | 5.9 | 33.3 | 40.8 | 34.4 | 48.9 | 14.5 | 28.2 | 7.7 |
| Italy | 5.1 | 14.3 | 58.2 | 44.4 | 33.4 | 47.0 | 20.4 | 30.7 | 10.3 |
| Portugal | 7.3 | 11.9 | 53.7 | 44.1 | 45.8 | 61.6 | 18.0 | 27.2 | 9.2 |
| Spain | 5.2 | 12.5 | 58.8 | 23.8 | 28.5 | 53.5 | 17.8 | 24.5 | 6.6 |
| <i>LR</i> | 14.5 | 23.2 | 19.8 | 16.5 | 50.4 | 64.9 | 17.1 | 19.7 | 2.6 |
| Australia | 15.9 | 29.4 | 19.2 | 14.7 | 47.9 | 66.3 | 14.8 | 19.7 | 5.0 |
| Canada | 14.3 | 19.2 | 5.3 | 7.8 | 52.6 | 69.0 | 13.9 | 20.0 | 6.2 |
| Ireland | 6.6 | 21.3 | 36.7 | 29.1 | 31.9 | 57.6 | 18.2 | 16.1 | -2.1 |
| New Zealand | 14.0 | 24.0 | 7.9 | 6.3 | 60.2 | 67.4 | 15.4 | 19.3 | 3.9 |
| UK | 19.0 | 25.7 | 45.6 | 24.5 | 54.5 | 65.6 | 23.3 | 23.8 | 0.4 |
| US | 16.9 | 19.5 | 4.3 | 16.3 | 55.4 | 63.4 | 17.1 | 19.2 | 2.1 |

a: Italy and the Netherlands: 1981, Belgium, Denmark, France, Germany, and United Kingdom: 1983; Spain: 1987; Switzerland: 1991

b: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, United Kingdom, and Switzerland: 1983; New Zealand, Portugal, and Spain: 1986; Austria: 1994

c: Belgium, Denmark, France, and Greece: 1983, Ireland: 1981; United Kingdom: 1984; New Zealand: 1986; Switzerland: 1991; Austria: 1994

NOTE.—SDR is social democratic regime, CR is conservative regime, and LR is liberal regime.

SOURCE.—OECD statistics

social actors provide welfare benefits (Esping-Andersen 1999). From these he constructs three typologies of welfare state regime; social democratic, conservative, and liberal. A social democratic regime is characterized by “a comprehensive specification of social risks” (Powell and Barrientos 2004, p. 86). The state plays a pivotal role in providing welfare production on the basis of universalism and egalitarianism (Esping-Andersen 1999). Therefore, decommodification is higher than the other regimes and stratification is also very low. A conservative regime considers the family as the main actor of welfare provision and social risks are specified as ‘family failure’. The welfare benefits are concentrated on male-breadwinner and earned on the basis of social contribution. Consequently, stratification is higher than any other regime. A liberal regime narrowly specifies social risks and confines the role of states, instead preferring the market (or the labor market) as the provider of welfare benefits. Social risks are regarded as a market failure and welfare benefits are required only if there are significant market failures. The state selectively provides welfare to the most vulnerable groups based on the means-testing. Thus, decommodification is the lowest of three regimes.

For last three decades, a lot of researchers have tested, criticized and adjusted Esping-Andersen’s typology of welfare state regime (e.g., Ferragina and Seeleib-Kaiser 2011; Powell and Barrientos 2004; Scruggs and Allan 2006; Vrooman 2009; see also Arts and Gelissen 2010). Although there are many problems relating to methodology and data, his typology is still worthwhile as a paradigmatic welfare state model (Arts and Gelissen 2010). That is, researchers may update the original data (Scruggs and Allan 2006), include more exhaustive social security programs or use an alternative methodology (Vrooman 2009), but many still conclude that classifying welfare states into three regimes is a valid approach.

However, there are two shortcomings in the existing research on welfare state typology. First, new social risks are not considered. As Ferragina and Seeleib-Kaiser (2011) mentioned, welfare regime studies have focused on old social risks such as old age and unemployment. The measures focus narrowly on income-maintenance programs such as pensions and social security spending, both of which are built around the standard male-breadwinner and are fundamentally passive programs (Esping-Andersen 1999; Powell and Barrientos 2004). Second, research methodologies for welfare state typology such as cluster analysis cannot describe and explain the change of welfare institutions. Esping-Andersen (1999, p. 73) also acknowledges that typologies “provide a snapshot of the world at one point in time and do not easily capture mutations or the birth of new species.”

To modify these drawbacks, sequence analysis is used to classify welfare states in response to new social risks. Sequence analysis, as discussed in detail in following section, is a research method designed to compare the trajectories of data and uncover its underlying patterns (Kruskal 1983; MacIndoe and Abbott 2009). Often utilized in the analyses of DNA, it was originally developed to emphasize (in contrast to variable-based causal models) a longitudinal, holistic approach, and the development of explanatory typologies (Pollock 2007). In a manner complementary to studies of institutional change, sequence analysis can effectively discern whether welfare states maintain existing institutions despite external change (drift), attach new elements to existing institutions (layering), redeploy the old system to a new purpose (conversion) (Streeck and Thelen 2005), or functionally recalibrate existing institutions (Hemerijck 2013). In other words, we can find out whether welfare regimes are path-dependent or path-breaking as well as which welfare states have undergone significant change.

Over the last decade, many researchers have tried to explain the change in welfare states. Bonoli and Natali (2012) and Hemerijck (2013) assert that welfare states are under pressure to change because of the instability of the labor market and the family structure. Therefore, comparative social policy research needs to focus on “policy trajectories (Bonoli and Natali 2012, p. 11)” and “dynamic” theoretical perspective (Hemerijck 2013, p. 41). Esping-Andersen (2010) also maintains that there are two solutions for Bismarckian countries facing pressure to change. The first solution is to conform to the existing welfare model, whilst the second solution is to produce a genuine ‘regime-shift.’ (Esping-Andersen 2010, p. 18). In line with such research, sequence analysis can not only empirically detect the trajectories of policy change in response to new social risks, but also ascertain the critical juncture of the transformation of welfare state.

Data and method

Data

The object of analysis is data from 21 OECD countries from 1980 to 2009. The analysis begins in 1980 due both to the availability of this data and the fact that the ‘Golden Age’ of the welfare state appears to peak around that year (Starke, Obinger and Castles 2008, p. 976). The variables used in this analysis are total social expenditures, total tax revenue, ALMP, and family

expenditure.² All of the variables are measured as a percentage of gross domestic product (GDP). The social expenditure database (SOCX) and revenue statistics published by OECD are used for this research. The social expenditure database consists of nine categories: old age, survivors, incapacity-related benefits, health, family, ALMP, unemployment, housing, and other policy areas. The revenue statistics is used to measure the total tax revenue.

Four of these variables require further explanation. The total social expenditures represents the fundamental ability to cope with social risks. If the total social expenditure is high, welfare states are more likely to supply resources aimed at negating new social risks while still managing the existing social risks through, for example, pensions and health care. However, if the total social expenditure is low, welfare states will struggle to solve both old and new social risks. ALMP aims at stabilizing the supply of labor, and is different to the passive labor market policies aimed at income maintenance for unemployed workers. ALMP was originally used in Sweden the complement labor policy to the Rehn-Meidner model. When workers lost their jobs at an uncompetitive company, the government retrained them and reallocated them to competitive companies. However, from the early 1980s, most welfare states have taken advantage of ALMP to solve long-term unemployment and facilitate 'activation' policy (Nelson 2013).³ Therefore, ALMP is used to measure the welfare states' response to labor market uncertainty. Family expenditure includes cash benefits for families and all social service expenditure. Family expenditure is related to the welfare states' response to the changes in family structure. It includes publicly subsidized childcare, care services for the elderly, the health service, family allowance and paid parental leave (Bonoli and Natali 2012). Total tax revenue consists

² This research uses the level of social expenditure to analyze the changes in the welfare institutions. Welfare states developed the welfare institution to manage social risks such as old age, illness and unemployment and then expanded the total amounts of welfare expenditures for sustainability and development. Although problematic because the social expenditure is influenced by the change of GDP and the number of beneficiaries, it can give a first estimation for how much welfare states have developed policies in specific fields. This also makes it possible to combine many variables into a simple indicator, which contains a substantial amount of information (Bonoli 2007, p. 507). Practically, many empirical studies have made use of welfare expenditures as an indicator of welfare institution or strategy (e.g., Bonoli 2007; Castles 2009).

³ Bonoli (2011) classifies ALMP into four types. First, incentive reinforcement is to encourage the unemployed workers to re-enter the labor market by curtailing duration and rate of benefits. Second, employment assistance aims at removing obstacles to enter the labor market. Third, occupation is to prevent the depletion of human capital associated with unemployment by expanding public employment. Lastly, training aims at "upskilling" unemployed workers.

of total tax and social contributions as a percentage of GDP. After the 1980s, as the adoption of the floating currency system and the diffusion of neoliberalism ideology were implemented, the extent of national finances that welfare states can manage has been shrinking. Furthermore, as the demand for pension and health services has increased with demographic ageing and reduced social contributions due to decline in full time employment, securing an adequate amount of welfare finance has become an important issue in coping with new social risks. Thus, total tax revenue is used to measure how much welfare states are preparing for welfare finance.⁴

Research method

The methodology applied in this paper is sequence analysis (SA). SA was originally invented by biologists to compare DNA sequences to figure out to what extent two DNA strands are analogous to each other or to find out the distance between them (Kruskal 1983; see also Brzinsky-Fay and Kohler 2010). Sequence data consists of an ordered list of items such as events or numbers. The term SA refers to “a body of questions about social processes and a collection of analytical techniques designed to address them” (MacIndoe and Abbott 2009, p. 387). The common characteristic of SA is that it considers each data sequence as a whole, rather than as stochastically generated at each point - as in event history or time series analysis (Ibid., p. 387).

There are many methods of undertaking SA, but for this paper, we chose optimal matching (OM). OM is essentially the first step in a SA analysis to calculate the distance for each pair of sequences in a data set. It needs to be emphasized that OM is basically descriptive as opposed to causal in its orientation. Unlike other types of quantitative analysis, OM is not concerned with hypothesis testing. Instead OM is a means to further analyses of classification or typology building such as cluster analysis or multidimensional scaling (MDS) (MacIndoe and Abbott 2009, p. 388). OM algorithms define simple algebras that create a metric for distances between whole sequences of events. There are two ways to make sequences equal. First, ‘substitution’ replaces an element of a sequence with a different element. Second, ‘input and delete (or indel)’ literally inserts or deletes an element from the sequence.

⁴ Manow (2010, p. 280) also asserts that “whether a welfare state is financed through taxed or through social insurance contributions had a crucial impact on how the welfare state adjusted to the dire economic environment since the end of the golden age in the mid-1970s.”

In this manner, optimal matching is a process to find the least costly way of making two sequences equal through substitution or indel (Abbott and Tsay 2000; Lesnard 2006; MacIndoe and Abbott 2009).

Why do we need to make use of SA when researching welfare? Abbott (2000) suggests that using SA in the social sciences can help us when “fishing for patterns,” and, ultimately, in identifying the sub-rhythms of social processes. OM is used to differentiate both events with different rhythms and events whose cadence is close (Lesnard 2006, p. 10). Welfare states have implemented social policies in various ways in responding to new social risks. Although states may, on the surface, appear to follow the same policy, the level, extent, and direction of that policy will be different. Therefore, by finding out the trajectories of the welfare states’ response to new social risks over the past thirty years, it is possible to discover whether welfare regimes have maintained or changed their system. We can also categorize the welfare regimes more comprehensively by combining the four policy options in this paper.

For the last decade, many studies have emphasized the necessity of welfare regime change (Arts and Gelissen 2010; Ferragina and Seeleib-Kaiser 2011; Powell and Barrientos 2004). Whilst these studies have highlighted the necessity of welfare regime change, they lack comprehensive empirical analysis since they only compare specific time points rather than whole periods. SA has the advantage of categorizing the process of change by analyzing the whole sequence, and can therefore help to overcome this shortcoming. Scholars such as Palier (2010), Pierson (2004) and Bonoli (2007) have referred to the need for sequence analysis to be applied to welfare state research, but have not put this into practice. Abbott and DeViney (1992), meanwhile, have conducted a sequence analysis of welfare regimes, but their study does not reveal current trends as it focuses on the order of adoption of five welfare institutions. Thus, our attempt to prove the trajectories of welfare institution change has meaningful theoretical and methodological implications.

Continuous variables are categorized in this study. In spite of the criticism regarding transforming continuous variables into categorized variables (Harrell 2008; O’Brien 1981),⁵ many researchers argue that the use of this method in political science and psychometrics is justified because of

⁵ For example, Harrell (2008) criticizes the categorizing of continuous variables because it causes the loss of power and precision of estimation means and there is not an overarching agreement on the choice of cutpoint which causes an interpretation problem. For more details, see Harrell (2008).

its ability to easily explain regression results and to compare two extreme groups (Cureton 1957; Gelman and Park 2009; Preacher et al. 2005). For example, by conducting 10,000 simulations, Gelman and Park (2009) claim that dividing a variable into 1/4 or 1/3 can minimize loss of efficiency compared to original linear regression based on a continuous predictor. The meaning of categorizing continuous variables in SA can be conjectured from Abbott (2000). He asserts that indel or substitution costs used by SA do not mimic something happening in the real world, but find patterns of change (Abbott 2000, p. 68). In other words, "it is an abstract operation, in this respect not very different from calculating the arithmetic mean of a series of numbers, used only in order to assess the degree of similarity of sequences." (Lesnard 2006, p. 10). In the same manner, finding out whether the general level of social expenditure and total tax revenue is maintained, increased or decreased is more important than retaining the exact values. Indeed, in the renowned welfare research, *The Three Worlds of Welfare Capitalism*, Esping-Andersen (1990, p. 54) also categorizes four continuous variables into three decommodification indices on the basis of mean and standard deviation. However, if the data is skewed, using mean and standard deviation to categorize data could distort the values. Thus, the quartile of data is used in this paper.⁶

Substitution cost is only used with regards to OM. The use of indel (input and delete) costs with sequences related to social events could have unwanted consequences and should be avoided whenever the timing of events is pivotal (Lesnard 2006). That is, using indel costs means warping time. Since this study shares the same time scale, only substitution cost should be used to avoid the distortion of time. To calculate the substitution costs, a substitution matrix is used based on transition likelihoods between positions⁷ (Caswell and Kleif 2013; Han and Moen 1999). Transition likelihoods represent a data-generated definition of costs in opposition to a theoretically derived definition and are recommended when lacking specific theory on the subject matter (Lesnard 2006; Pollock 2007; see also Caswell and Kleif 2013). This paper also uses a transition likelihood substitution matrix because it is difficult to explain theoretically the difference of

⁶ The quartiles are designed on the basis of the data of 21 countries and 30 years (630 data points) by each variable. Ferragina, Seeleib-Kaiser and Tomlinson (2012) also recoded continuous variables into quartiles to avoid the problems related with poorly distributed variables and conducted Multiple Correspondence Analysis (MCA) for unemployment protection and family policy variables in order to examine the dynamics of welfare regime change.

⁷ In this paper, the values of categorization range from 0 (minimum) to 3 (maximum).

transition from 0 to 1 and from 3 to 4. In addition, as mentioned by Abbott (2000, p. 68), substitution costs in this research do not represent the change in the real world, but the pattern of change. Therefore, it is not problematic to use a transition likelihood matrix based on a data-generated definition. On the basis of a transition likelihood matrix, four dissimilarity matrices are calculated to find the distance between the trajectories of each welfare state's welfare policy. Then, the four matrices are normalized and combined to form one overall matrix. There are two strategies for handling multiple dimensions. The first strategy is to make one string combining information on all dimensions. The second strategy, which is used in this paper, combines the dimensions later. The reason we use the second strategy is that "as the number of dimensions increases and as the number of elements increases for each dimension, the former strategy becomes quickly unwieldy." (Han and Moen 1999, p. 203). With this data, we could define 256 elements (4x4x4x4) and the full substitution cost matrix would be 256 x 256.

Results and Findings⁸

The whole sequences by variable are shown in figure 1. First, total social expenditures are generally increasing. Presently, the countries that have a low level of total expenditures are also increasing their total social expenditures. This result could be interpreted as indicating the escalating welfare needs for old and new social risks. Second, in terms of total tax revenue, there are two extreme groups, the same as for new social expenditures. We infer from this that it is not easy to alter the level of total tax revenues compared to social expenditures because the variation of total tax revenue is less than other expenditure variables. Third, ALMP reached its highest level in the 1990s and has decreased in level since the mid-2000s. This finding corresponds to existing research (e.g., Bonoli 2011; Nelson 2013). Fourth, regarding family expenditure, the countries that currently spend high levels on family expenditure have increased family expenditure since the early 1990s. Meanwhile, the countries that spend low levels on family expenditure have increased family expenditure since the early 2000s.

Cluster analysis, specifically hierarchal ward clustering, is conducted after combining the four variables into one (figure 2). Based on the Calinski

⁸ A program used in this study is 'SA' module in STATA 12.0. For details, see Brzinsky-Fay, Kohler and Luniak (2006).



NOTE.—Each bar represents countries and X axis represents time span.

FIG. 1.—Whole Sequences by Variables

and Harabasz pseudo-F index and the Duda-Hart $Je(2)/Je(1)$ index that are used to determine the number of clusters, whole countries are divided into four groups (table 3). Group 1 consists of Denmark, Sweden, Belgium, Finland, and France. Group 2 contains Austria, Germany, Norway, and the Netherlands. Group 3 consists of Italy, Spain, Ireland, Canada, New Zealand, and the UK. Group 4 contains Japan, the U.S., Australia, Switzerland, Greece, and Portugal.

The modal sequences⁹ or the representation of each group is presented

⁹ Modal plot is a representative sequence composed by the most frequent element for each position. If more than one element is the most frequent element at a certain position, the highest value is used.

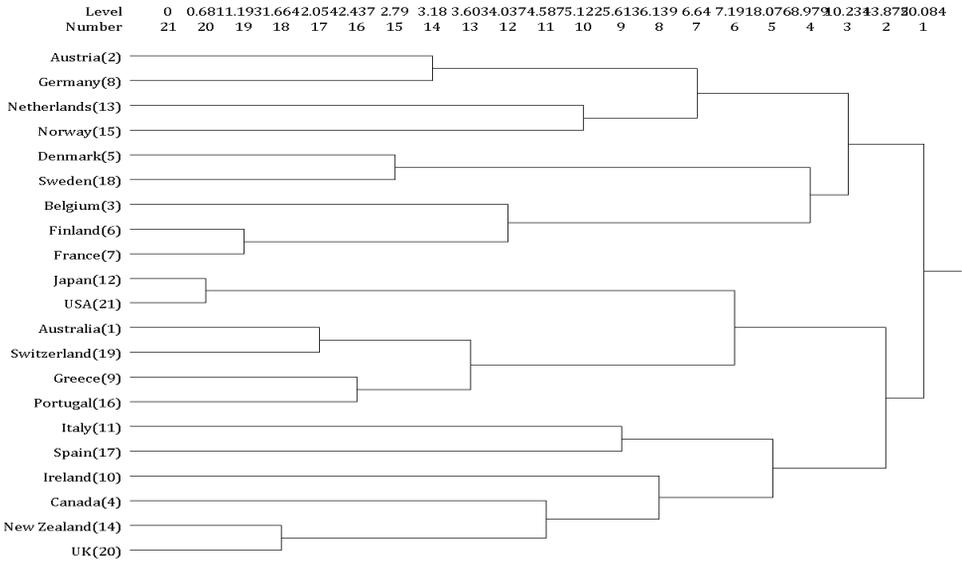


FIG. 2.—The Result of Cluster Analysis Based on Sequence Analysis

TABLE 3
FOUR GROUPS OF WELFARE STATES BASED ON CLUSTER ANALYSIS

| Group 1 | Group 2 | Group 3 | Group 4 |
|---------|-------------|-------------|-------------|
| Denmark | Austria | Italy | Japan |
| Sweden | Germany | Spain | USA |
| Belgium | Netherlands | Ireland | Australia |
| Finland | Norway | Canada | Switzerland |
| France | | New Zealand | Greece |
| | | UK | Portugal |

in figure 3.¹⁰ First, (with the exception of two short periods in the early 1980s and early 1990s) the countries in Group 1 have consistently maintained the highest level (categorization value of 3) of total social expenditure and total tax revenue since the 1980s. Moreover, group 1's family expenditure and ALMP rating increased in the early 1990s and has stayed in the highest category since then. We can thus characterize this group as having *the highest level of risk management since the 1990s*. Sweden and Denmark's story is

¹⁰ The whole sequence for each variable is presented by country in Appendix 1.

instructive. Dealing with the oil shock of the 1970s, Sweden and Denmark increased employment in the public sector to absorb the unemployed workers from the manufacturing industry. In addition, family allowance was introduced to address gender equality and publicly funded care for the elderly has been expanding since the 1970s. This early adoption of social services related to caring for young children and the elderly catalyzed the dual-earner family-friendly welfare state (Hemerijck 2013; Kautto 2010). In particular, Denmark has actively implemented an 'activation' policy through a series of labor market reforms in 1994, 1996, and 1998 (Larsen and Andersen 2009). Belgium is also in this group. At first glance Belgium is commonly taken to have a typical conservative welfare regime. However, Belgium has transformed into a new type of welfare state by guaranteeing minimum wages and providing universal benefits. Between 1970 and 1983, public social spending increased from 14.2% to 24% and has been maintained at around that level since then. The proportion of traditional welfare expenditures such as pension and health services decreased since the 1990s, while social expenditures that cope with new social risks increased (Vandenbroucke 2012). For example, 'optional familialism' has been implemented in family policy to support dual earner households more than sole breadwinner households. Consequently, Belgium's maternal employment rate is approximately 70 per cent, which is almost the same as the Scandinavian countries. Welfare finance is secured by increasing taxes such as value added tax (VAT) whilst curtailing the proportion of social contributions. In France, new social risks such as youth or long-term unemployment were addressed by the RMI (Revenu Minimum d'Insertion), which guaranteed a minimum level of income and was introduced in 1988. It was developed into the RSA (Revenu de Solidarité Active), which aims at encouraging employment, in 2009. Concerning welfare finance, the French government succeeded in tax reform in 1990 and thus turned tax into the major revenue resource instead of social contribution (Palier 2010).

For group 2 total social expenditures reached the highest level in the early 1990s, but total tax revenue generally stayed at a middle-high level (that is, a categorization value of 2). ALMP and family expenditure climbed to the highest level in the early 1990s, however ALMP has decreased by one level since the mid-2000s. Therefore, Group 2 can be characterized as *managing risks through social expenditures, but stagnant in welfare financing*. Countries represented in Group 2 conducted welfare reforms in the 1990s. Germany struggled to reform welfare institutions after unification in the 1990s. Through the 'Hartz' reform after the 2000s, the activation policy was

implemented to curtail insurance benefits for the unemployed and encourage them to re-enter the labor market. In terms of family policy, 'dual-transformation' (shrinking social policies focused on the male wage earner family and expanding policies for the dual-earner family) is in progress (Bleses and Seeleib-Kasier 2004). However, the endeavor to replace social contributions with taxes in welfare finance is hampered by "the adverse effects of Germany's multi-veto point polity" (Manow 2010: 298). Austria also implemented reform of a labor market policy in the mid-1990s. The government focused on cutbacks in unemployment benefits and initiated an activation policy. However, Obinger and Tálos (2010: 110) claimed that this reform did not mean a real departure from existing policy routines. Even though the Austrian government raised family allowances and tax deductions in response to a decline in fertility rates, the overall amount of welfare benefits was curtailed in order to solve a budget deficit problem and allow the country's accession European Union (EU) in the mid-1990s. Welfare finance is still largely maintained by social contributions (Obinger and Tálos 2010). The Netherlands has transformed its labor market policy into activation in the name of 'jobs, jobs, and more jobs.' (Hemerijck 2013). This policy made it possible to increase part-time work by providing treatment equal to that received by full time workers. This increased the employment rate and reduced passive welfare benefits (Hemerijck and Marx 2010). Meanwhile, Norway is also categorized in this group since she is a Social-Democratic latecomer and strengthened welfare institutions from the 1980s (Ferragina, Seeleib-Kaiser and Tomlinson 2012).

Group 3 countries mostly maintained a low-middle level (categorization value of 1) for total social expenditures and total tax revenues. ALMP attained a middle-high level from the 1980s and the early 1990s, but has decreased since then. Although family expenditure displays a wide range of fluctuation because there is a large variation among the countries of group 3, they have generally increased by one level since the 2000s. So, when considering the overall trajectories of change, Group 3 could be characterized as *partial responses: ALMP in the 1990s and family expenditure in the 2000s*. For example, the UK adopted ALMP when the Labor party took office in 1997. In the name of 'New Deal,' ALMP makes it easy for younger individuals and single parents to enter the labor market through intensive training and work preparation programs (Taylor-Gooby and Larsen 2004). Furthermore, 'make work pay' strategy introduced working families tax credit (WFTC) to provide tax credits and guarantee a minimum wage for low income families. WFTC motivates these families to participate in the labor market (Hemerijck



FIG. 3.—Modal Plots by Four Groups

2013, p. 174). Just like the UK, the government of Ireland has also concentrated on the enhancement of a well-educated workforce through economic and welfare reforms. In addition, ALMP was expanded for the long-term unemployed to attain work experience on community projects in the early 1990s (Fitzgerald 2005). Interestingly, among the conservative regime countries and Southern European countries, Spain and Italy are included in this group. Ferrera (2010, p. 626) also asserts that “since the mid-2000s Spain has markedly accelerated the recalibration of its social model, clearly leapfrogging the other three other countries of the area.” In the mid-1980s investment in the activation policy was initiated and the protection of the unemployed workers was curtailed in 1992 (Guillén 2010). In addition, Spain changed the labor laws to relax the protection of core employees and enhance the welfare rights of irregular and temporary workers in 1997, 2001, and 2006 (Ferrera 2010). Concerning Italy, the Italian government

transformed health care system from insurance basis to universal basis by establishing the National Health System in 1978 and reformed the national pension system for financial sustainability in 1994-5. Furthermore, since new social risks are recognized as a potential source of risks in the early 1990s, activation policy such as ALMP was increased around that time (Jessoula and Alti 2010) and family benefits such as social services were expanded in 2000 (Hemerijck 2013).

Countries in Group 4 have increased total social expenditures from the lowest level since the late 1990s. They also increased total tax revenue from the late 1990s, but Switzerland, Japan and the U.S. still maintain the lowest level. Concerning ALMP, some countries expanded it from the mid-1990s, but that of Japan, the U.S., and Greece remains in the lowest level. Meanwhile, most countries in this group have increased family expenditure since the early 2000s. Therefore, we can characterize this group as *starting risk management from the 2000s*. The southern European countries, Greece and Portugal, belong to Group 4. The typical characteristics of southern European welfare states are extended households that take a pivotal role in rearing young children and caring for the elderly, large informal economies, tax evasion, and institutionally powerless administrations. These conditions can result in fragile grounds for the establishment of social safety-nets (Ferrera 2010, p. 624). Among the conservative welfare regime countries, Switzerland is included in Group 4. The size of the welfare system in Switzerland is still modest since a time lag between the constitutional amendment and the adoption of the national law exists (Häusermann 2010). Consequently, unlike other European welfare countries that already enlarged the level of welfare benefits, Switzerland is under pressure for retrenchment while a major social insurance system has not been comprehensively developed.

Conclusion

In summary, the categorization of welfare states based on sequence analysis is different from the three worlds of welfare states classified by Esping-Andersen (1990, 1999). The comparison between these two classifications is presented in figure 4. In the same line of reasoning as prior research (Esping-Andersen 1999; Huber and Stephens 2007; Taylor-Gooby 2004), social democratic regime countries actively respond to new social risks. Among the four groups that emerge from sequence analysis results, they belong to Group 1 and 2. These maintain or attain high level of social

expenditures and total tax revenue. On the contrary, conservative regime countries show a wide variety of trajectories of social policies against new social risks. Like Belgium and France, some countries actively respond to new social risks, and are in this way similar to the Scandinavian countries, while other countries such as Japan, Greece, and Portugal only passively respond to new social risks. These results echo Palier (2010)'s findings that among Bismarckian countries, some countries succeed in welfare programs and pension system reforms, while other countries do not succeed in reforms. Lastly, liberal regime countries also experience various trajectories of welfare policies. The UK and New Zealand have high levels of family expenditure and ALMP. On the other hand, the U.S. and Australia spend a lower amount on of social expenditures and secured lower tax revenues. Most liberal regime countries acquire the lowest level of welfare finance.

The results of this research indicate that existing welfare regimes are not path-dependent, but are undergoing a substantial level of change. However, we cannot definitely identify them as path-breaking because the time span is too short in comparison with Esping-Andersen's typology of welfare regimes. Specifically, conservative welfare regime countries have shown various ways of adapting to new social risks; Belgium, France, Italy, and Spain are undergoing a significant change, while Japan and some Southern European countries still maintain their existing welfare system. Among the liberal regime countries, some are actively responding to new social risks while others maintain existing institutions. For example, Ireland and the UK take new approaches that are different from the characteristic strategies of liberal welfare regimes (Hemerijck 2013). It is wrong, therefore, to regard the landscape of welfare regimes as in any way "frozen" (Pierson 2001). However, we need to emphasize the point that a welfare regime can be transformed or recalibrated in various directions.

This research described, through sequence analysis, the trajectories that welfare policies aimed at new social risks have taken over the last three decades. It then examined whether existing welfare regimes are sustained or altered through cluster analysis. Although it is worthwhile focusing on the sequence of change in welfare policies, this study has the limitations that could stimulate future research. First, future research could categorize welfare states in a manner that reflects the outcomes of welfare policy. For example, the notion whether the welfare states' response to new social risks solves the social solidarity problem created by liberalization and the dualization of the labor market at various levels (Thelen 2012). Second, a change in political regimes and production regimes also needs to be considered to achieve a

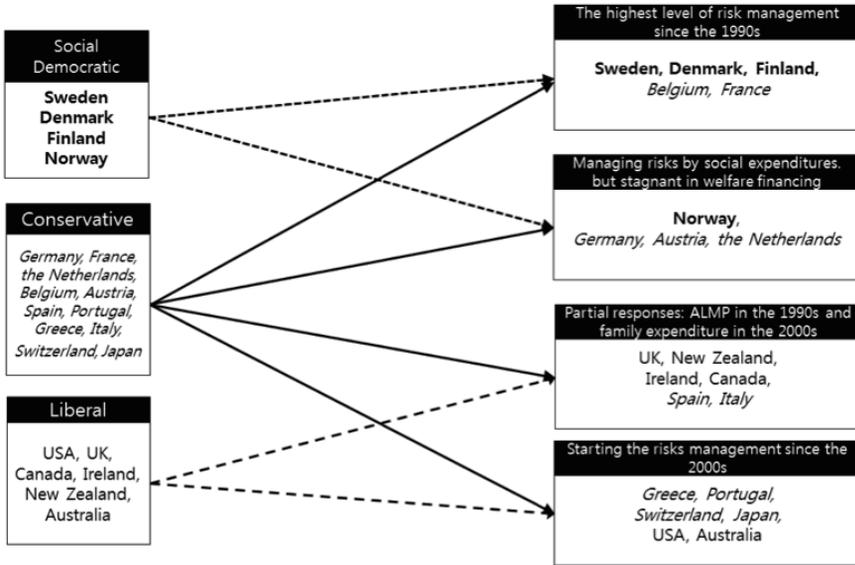


FIG. 4.—Comparison between Esping-Andersen’s Welfare Regimes and the Categorization of Welfare States Based on Sequence Analysis

nuanced analysis of the trajectories of welfare state change. Currently, many studies have tried to find a corresponding relationship among production, political, and welfare regime (e.g., Soskice 2008). Welfare regimes cannot be changed independently. However, welfare regimes can be affected by the change of labor market structure related to the production regimes. Furthermore, the process of political consensus is very important for reforms of welfare institution. Thus, we need to conduct a comprehensive analysis to understand the trajectories of change across production, political, and welfare regimes.

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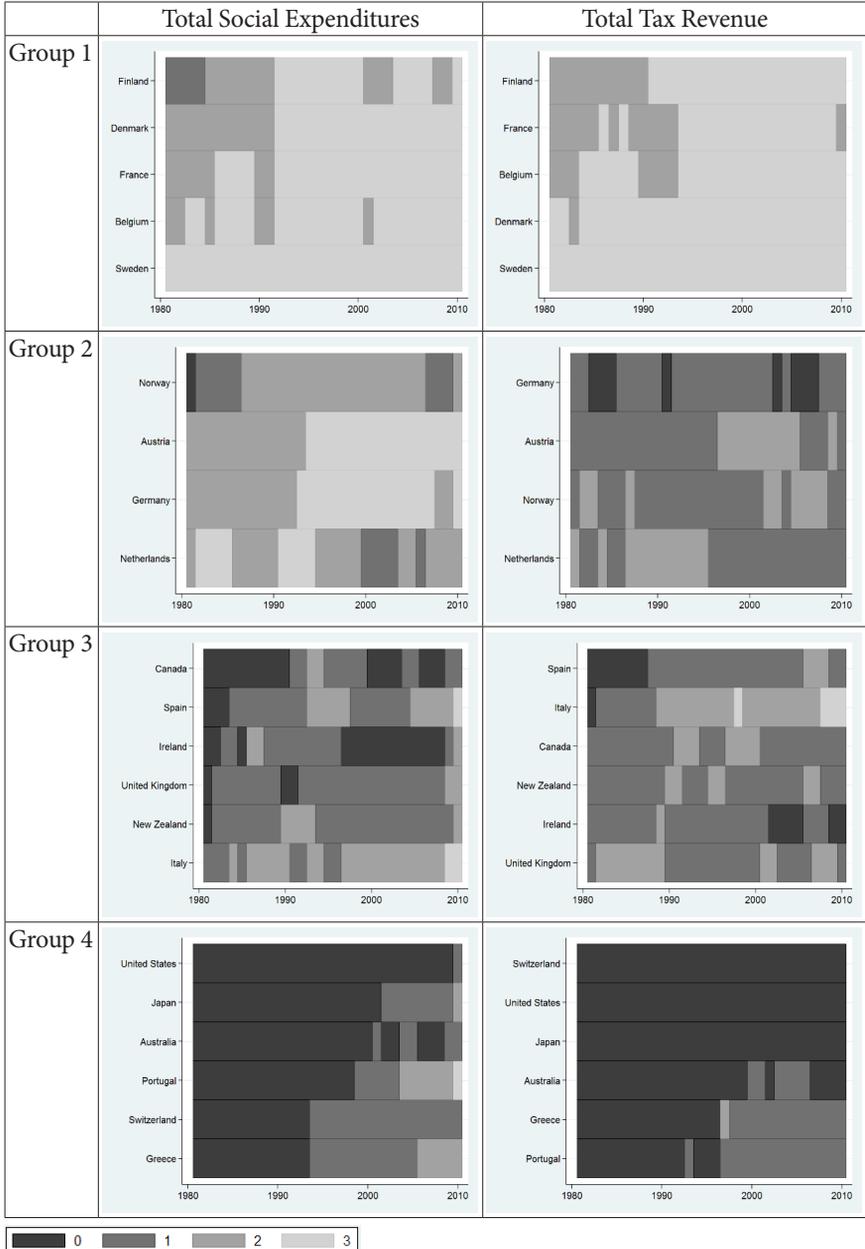
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JONGMIN YANG is Ph.D. candidate in Sociology at Seoul National University. His areas of interest include comparative welfare research, social inequality, and economic sociology. His most recent publication is "*Sijang Gaebangae Ddareun Sahoejeok Weehuemeul Haegyulhagi Weehan Gookgaeui Bokjijichul Guseong Gwa Gyungjaejeok Seonggua*." (Welfare Policy for Solving the Social Risk Caused by Market Openness and Its Economic Performance in 19 OECD Countries, 1980-2007) *Hanguksahoehak* (Korean Journal of Sociology, 2013) 47(1): 107-47. Address: Department of Sociology, College of Social Sciences, S Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 151-742, Republic of Korea [E-mail: muris86@snu.ac.kr]

Appendix

FIG. 5.—Whole Sequences of Each Variable by Country



(CONTINUED)

