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An empirical analysis on the rationalization of world development

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An empirical analysis on the rationalization of world development

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ABSTRACT

The tremendous changes in world society during the past several decades raise a number of important questions that require new empirical evidence and theoretical explanation for studies of rationalization. World society theory treats rationalization as a cultural process. This theory argues that a rational world culture, which originated from western culture, has universal influence. Based on this idea, this thesis proposes the standardized social measurement as one of the main embodiments of the rational world culture. Thus, participation in global social survey infrastructure (GSSI) is used to measure the diffusion of scientific rationality in world society. Based on this measurement, a descriptive analysis on the global participation in GSSI and an event history analysis on the history of global participation are conducted to describe this process and provide insights into its causes. Results of descriptive analysis show the national participation in GSSI is extensive, but highly unbalance even throughout its expansion in recent years. Event history models show that countries with closer connections to world culture are at greater risk of joining the GSSI. Both results support the argument of world society theory. Rationalization in contemporary world is driven by the world culture through diffusion.

CHAPTER 1. INTRODUCTION

Background

Rationalization is a central question in sociology. As early as the Enlightenment Era, scholars of rationalization sought to find an underlying pattern for social development. This exploration was especially heated during the 20th century marked with great scientific development and perhaps overdevelopment. Weber's (1905) analysis of western society's rationalization is the foundation of modern literature on the topic. He described this process as the prevalence of mean-end instrumental rationality over other kinds of rationality. Following this theoretical track, later theories explain many social problems in the 20th century, for example, technique dominance, loss of meaning and holocaust, which improved our understanding of modernity and development.

However, the Weberian theory is not without weakness. One weakness is the lack of empirical evidence. Indeed, rationalization is difficult to be operationalized and tested. Even the sparse empirical research found weak relationships between Protestant ethic and economic development. To rationalization in new era, World society theory provides alternative explanations. In this theory, rationalization in world society is an expansion of the rationalized western culture. The rationalized purposes of world development (Meyer, Boli, Thomas and Ramirez 1997) have become so deeply institutionalized as to have achieved a take-for-granted status among many world society's actors. Because world cultural values and goals have become deeply embedded in national and international institutions and scripts, they now exert considerable exogenous isomorphic pressure for further rationalization and standardization. This diffusion of rationality in world society theory distinguishes it from the structuration of rationality in Weberian theory. According to this theory, I propose that institutionalization of the world cultural value of scientific rationality exerts formal pressure on individuals and nation-states worldwide. Failure to

act in accordance with world cultural norms and values puts actors in the world polity at risk of illegitimacy and isolation from the world society.

Scientific rationality in world culture implies a new measurement of rationalization: scientific measurement. On the one hand, this is very closely related to the formal rationality in Weberian theory. Since any rational activity requires clearly defined measurements, it is through these standardized measurements that people can make abstract ideas concrete, calculable, predictable and, therefore, achieve stability and efficiency. On the other hand, prior research on the international diffusion of rationality as defining principles of world development suggest the international standardization movement has played an essential role in the rationalization of world society and world development (Meyer et al 1997, Boli and Thomas 1999). The standardization of scientific measurements exemplified in the international data infrastructure implicitly assumes the universal prevalence of latent concepts and universal comparability of the measurement constructs. The activities of data collection, analysis, and distribution are conducted by western based global scientific organizations and built on scientific principles with origins in western culture. This system of standards constitutes actors which can be accurately compared, for instance, a series of standard measurements (e.g. GDP per capita, human development index and fertility rates) constitute people's knowledge about a nation state. It is the mediation between a single country and world society. In this sense, how a country is integrated into global data infrastructure indicates the degree to which it has been rationalized and incorporated by world society. The working hypothesis for this research is: more rationalized countries have more global measurements.

In this research, rationalization is measured by the global social survey infrastructure (GSSI). It is posited that differences in the risk of being surveyed in multi-countries and multi-regions and global social survey research programs are positively associated with world polity

penetration and socioeconomic development. A census of global social survey programs is collected, which includes all general, standardized designed, comparative, and public accessible survey programs from 1948 to 2013. A descriptive analysis to explore the spatial and historical expansion of GSSI participation is in the first step. By doing this I seek to answer the following questions: is the distribution of global participation patterned in GSSI? If so, which countries and regions are more surveyed? Which are less surveyed? What is the trend for participation globally and regionally? In the next step, an event history model with a smaller sample is constructed to test the four hypothetical factors to the expansion of GSSI— development, globalization, world culture and scientific relation.

It is expected this empirical work will contribute substantial new material to research on rationalization. To theory, it is an empirical application of world society theory to the analysis of contemporary rationalization of the world system, which extends theoretical understanding of rationalization from historical focus on individual societies to the whole world society. An innovative methodological contribution of this research involves the deployment of a new measure of world rationalization using global data infrastructure. This research identifies the theoretically important processes of rationalization in the current world by analyzing patterns in the global data infrastructure.

Organization

This thesis has four sections. The first section introduces the concept of rationalization in Weberian theory and its development in theories that have been developed since Weber. Next, world society theory is introduced to expand knowledge of world-level rationalization the contemporary era. The working hypotheses will largely be derived from this theory. The second

section describes the data and methods. Results are reported in the third section. Findings are discussed in the final section.

CHAPTER 2. REVIEW OF LITERATURE

Weber's rationalization

A large component of Weber's work is dedicated to the analysis of rationalization in western civilization. In his analysis of the origins of capitalism, Weber analyzed the religious roots of rationalization, which he posited as stemming from rational asceticism associated with the Protestant ethic. The Protestant ethic regards rational work as the method to fulfill the calling from God (Weber 1904). Thus, wealth gained religious legitimation and became the demonstration of efforts made to glorify God, from which the spirit of modern capitalism and rationalization was born. Weber went on to theorize that the religious roots of rationalization would become obsolete by the needs of economic development. Modern rationality would be institutionalized and structured, which pose great formal influences on human society. In this historical trend, traditional rationality (rational asceticism) was replaced by modern instrumental rationality (structured economic needs), which leads to the rationalization of industrial society, according to Weberian theories.

One example was authority (Weber 1922). Weber summarized three types of authority: charismatic, traditional, and rational. Charismatic authority is based on the leader's personal characteristics. Traditional authority traces its roots traditions, such as aristocratic politics based on historically established social rank. Rational authority rests on rational rules and laws based on common agreements. Although these three types of authorities are not completely chronological, they do demonstrate a trend of rationalization whereby the source of social authority is changed from arbitrary personal influences to institutionalized impersonal rules.

Bureaucracy is another important example of modern rationalization in Weber's theory. Weber (1925) summarized the traits of bureaucracy, including document-based (or file) and

specialized office management, rule oriented, strictly hierarchical position and salary, and professionalization. Ideally, a bureaucratic organization is built on fixed rules documented thoroughly; these rules unambiguously states the commitment and salary of every position. Personnel are trained systematically into specific tasks and responsibilities, which makes them replaceable; change of personnel will not have great influences on the operation of the whole system. All of these features demonstrate bureaucratic organizations are designed to minimize uncertainties and irrationality for the efficient operation of organization. Due to its certainty and efficiency, Weber argues (1925), bureaucracy is indispensable and unbreakable in the modern society. This is the epitome of modern rationalization—powerful and ubiquitous.

Post-Weberian theory of rationalization

One major criticism of the Weberian theory of rationalization is Weber's ambiguous definition of rationality (Kalberg 1980). An effort was made by Kalberg to clarify types of rationality in Weber's theory. He summarized four types of rationality based on Weber's analysis on rational action, namely, (1) practical rationality, (2) theoretical rationality, (3) substantial rationality and (4) instrumental rationality. To be specific, practical rationality involves the rationality of pragmatic interests, i.e. "daily experiences". Theoretical rationality is the abstract but systematic rationality people generate to explain reality, i.e. religious worldviews. Substantial rationality refers to value systems composed of many related and consistent values. For example, Marxism, which consists of values based on materialist conceptions, is a kind of substantial rationality. The Protest ethic is another kind of substantial rationality. Substantial rationalities always represent the values of a social group. Formal rationality is the mean-end rationality based on formal rules. It only exists in fields of science, economics, and industry in the Industrialization Era. Ritzer (1993) developed the features of formal rationality—efficiency, calculability,

predictability and controlling. This definition emphasizes the nature of efficiency-oriented formal rationality[1]. Therefore, rationalization in modern society is the process where formal rationality becomes dominate in every social aspect. This is described as "McDonaldization" by Ritzer.

Habermas (1981) turned his attention to the rationalization of communication by providing a subjective perspective to understand rationalization. He argued Weber's definition of rationality did not encompass the subject aspect of human society, while rational actions were actually defined by social context. Communication, on the other hand, represented the subject field of society. By discussion and reasoning, people reached understandings and consensus. Habermas defined the "life world" as the phenomenological shared background of knowledge and values, which distinguished it from the system, as the functional aspect of society. In rationalization, the lifeworld separates from the objective society and becomes an object of formal rationality. Formal rationality affects communication, which distorts the life world.

One important implication of this process is the "loss of meaning". Weber was permissive to the future of rationalization: with the fading of religious influences, economic developments became purely utilitarian. Pursuing wealth needed no justification. "*Specialists without spirit, sensualists without heart;*" (Weber 1904/2009: 96). This powerful, ubiquitous instrumentally rational system with priority on efficiency would take the place of humanity, which was what Weber called the "iron cage". In critical theories, formal rationality is viewed as "technocratic thinking," which means people unthinkingly obey the structured rules for the structured goals instead of human rights. The rationalization of cultural and knowledge in the modern world, as

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[1] By Weber, rationalization is sociocultural process which can only be understood in corresponding social, cultural, and economic context. There were different rationalizations in different era. In this research, rationalization refers to the rationalization in modern society.

critical theorists argue (Marcuse 1941, Horkheimer and Adorno 1944), leads to a massive culture knowledge production system which imbues the "popular" culture and knowledge to people.

Theories of rationalization are highly in parallel with people's understanding of modernity. In the era that people painfully realized the adversity of modernity, especially after World War II, it was not surprising that theories of rationalization focus on the dark side of formal rationality and the future of humanity. However, the future of rationalization is not the main question this research attempts to answer. Weberian theories constitute the foundation of rationalization theory, i.e. the instrumental nature of formal rationality. But they cannot explain the increasingly irrational activities in modern society, for instance, the substantial growth of scientific ministries in governments, even in many undeveloped countries (Drori et al. 2002). One problem for rationalization theorists is that, the process of rationalization described in Weberian theory has proven difficult to test empirically. This is partly due to the challenge of operationalizing rationality. Several studies focusing on Protestantism even fail to find significant evidence (Delacroix and Neilson 2001, Norris and Inglehart 2004). A new theoretical perspective, which fits with contemporary world society and uses reliable and valid measurements of rationalization, is necessary.

Neo-institutionalism and world society theory

World society experienced tremendous changes in the latter half of the 20th century. With the collapse of the Berlin Wall, antagonism between East and West disappeared and people no longer faced the imminent threat of mass destruction by nuclear war. With decolonization, the world became increasingly diverse and 'development' attracted more and more attention. This is noted by the rapid diffusion of civil rights and environmental movements, net of a society's level of modernity.

Rather than treating rationalization as the dominance of formal rationality, institutional theories treat rationalization as a cultural process. This theoretical perspective echoes Weber's methodology of understanding the social process in a historical context. Meyer (2008) describes the branch of institutional theories as a line that ranges from the realist pole to the phenomenological pole, based on the extent to which the institutional context is recognized. At the realist pole, cultural effects are partly recognized. In their discussion of organizational isomorphism, DiMaggio and Powell (1983) analyzed the isomorphism of organizations. They found efficiency was partly the reason why organizational structures and strategies tended to be similar. In particular, efficiency or profit are the standards on which organizational structures and strategies are evaluated at the beginning of an organizational field or cultural context. They become less important after the organizational field is established. Organizations imitate strategies and structures for the purpose of legitimation of the organization, dealing with the unclear situation, or just because of personnel networks. In this case, rationalization of an organization is driven by irrational factors.

On the other pole of this theoretical line is phenomenological institutionalism. In this theoretical perspective, social actors are strongly culturally defined. Meyer's world society theory further extends this idea into a world culture. The main idea is the rational world culture with roots in western ideals has become the driving force of rationalization in the modern world. World culture establishes institutional orders, which contribute to several cultural models defining and structuring how societies work--the "actorhood" of all actors in world society. Meyer describes influence of world society (Meyer 2009: 174):

If an unknown society were "discovered" on a previously unknown island, it is clear that many changes would occur. A government would soon form, looking something like a modern state

with many of the usual ministries and agencies.... The society would be analyzed as an economy with standard types of data, organizations, and policies for domestics and international transactions...the population would be counted and classified in ways specified by world census models. Modern educational, medical, scientific, and family law intuitions would develop.

According to world society theory, the basic properties of western culture are the dualism of the world. This implies two unitary worlds: the spiritual and physical worlds. This dualism implies a structure of authority, an "overarching framework" in which God from the spiritual world provide ultimate truth and authority; social actors gain legitimation and authority from their confirmation by the gods. This dualism has a profound impact on western society. With the development, god is increasingly inactive and society becomes more and more important in mediating the two worlds. The impacts of this dualism persist in western countries and are inherited in world culture. This contributes three main characteristics[2] of world culture—scientific rationality, universalism, and individualism, which are discussed below.

Scientization. Scientization involves the expansion of authority of science and scientific rationality[3]. Science established its universal legitimation in natural science in the 19th century and then in social science in the 20th century (Meyer 2010). In modern world society, science is beyond its instrumental function. It is the source of authority. Scientific evidence becomes the main (in many cases the only) basis for decision making. In world culture, science plays a role as religion did in the past. This is not only because science provides the most powerful epistemology to explain the reality, but also because it makes people capable of fulfilling their "duties" in society. It is through science that people can further their exploration from the deep sea to the moon. It is

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[2] It is posited that these three features of western culture affect world culture. However, it does not mean they are unique in western culture.

[3] Both scientific rationality and formal rationality refer to the instrumental rationality based on impersonal rules. The term 'scientific rationality' emphasizes the importance of science in world culture.

also by science that people can fight disease, poverty, and starvation. In other words, science empowers humans. Like religion, science has itself a comprehensive system of rules, symbols, disciplines and communities, which makes it the rational tool to complete the universal and ultimate collective goods of the human being.

Universalism. Universalism of world culture has deep religious roots, specifically in the Christian church. By world culture theory, church is the representation of the kingdom of God in Christianity. It has the duty of bringing "God's glorious love" to the whole humanity without any distinctions. Church developed a unified symbol system, i.e. Bible, rites, and idols. This independent, universal system not only helped Christianity sustain an independent status against aristocratic nation states, more importantly, it helps Christians fulfill their duty despite the difference of language and tradition. Universalism is inherited and becomes an important property of world culture. It foresees the professional INGOs after the World War II, which serve as disinterested agents for the universal, stateless goal of development and justice of world culture when the power of nation states recede (Meyer 2010). Universalism in world society implies that world development and scientific rationality applies to all people and societies. Science knows no borders and neither do rationalizing activities of the world polity. Democracy, human rights, citizenship, education, and improvements in human well-being are seen as universal goals with universal application throughout the world.

Individualism. Individualism in world culture has roots in the dualism of western culture. On the one hand, the capacity of the individual is recognized. Humans, as an agent of the spiritual world, are believed able to achieve the social development and fulfill humanity with work in this world. Therefore, activities, which can improve this capacity, gain increasing importance. For example, education has experienced massive expansion during the last two decades (Frank and

Meyer 2007). This expansion even goes beyond the functional needs and becomes a paragon. The other implication is human rights are treasured with the empowerment of human. This explains the enormous development of global human rights affairs (Drori 2006).

World society theory shares some similarities with Weberian theory. Like Weber's theory, world society theory also focuses on explaining social phenomena in cultural context. Differences are striking as well. In world society theory, it is world culture that pose cultural pressure on actors in world society. This argument distinguishes world society theory from Weber's focus on cultural divisions. Besides, world culture theory emphasizes the cultural process of rationalization, i.e., diffusion. Indeed, one will not deny this impact if he or she thinks about the numerous figures and tables of "scientific findings" in mass media, or look at the widely expanded education institutions with similar curricular settings and teaching methods. This is different from the structuration process of formal rationality in Weberian theory. One methodological implication is that rationalization can be studied through this cultural process.

The main criticisms of world society theory concentrate on its implication for social homogeneity (Buttel 2000, Ingehart and Baker 2000, Guillen 2001, Beckfield 2003, 2010). Empirical evidence shows the existence of great diversities in the economy, politics, and culture. For example, using membership of INGOs as the measurement for national ties to world culture, Beckfield (2003) finds significant inequality in these ties. The rich, core western countries have more memberships than those other countries. Further research on the structure of world society then contracts the universalism of world culture (Beckfield 2010). Evidence shows this structure is fragmental, driven by exclusive global organizations. A related criticism asserts the "top-down" structure of world culture, where the culture influence diffuse from the West to the remainder of

the world is not dominating. Cultural impacts from other countries also have very significant "bottom-up" effects (Buttel 2000).

A clarification of "culture" in world society theory may be useful to justify the theoretical background of this research. In the world society theory, culture is not merely specific values, rituals, or aesthetics, but an ontological model which defines actors and actions. For example, it is not merely Christian values, but more importantly, the underlying Protestant asceticism, which directs people's lives as a "methodological way" being treated as culture in the world society theory. In this sense, the influences of world culture are indirect and long-term rather than direct and instant. In the broader perspective, heterogeneous structures, values, and entities do not necessarily mean no general world culture. For instance, the secondary education system in the United States differs from China in the content of class, exam requirements or infrastructure. But after all, both are institutionalized forms of secondary education which demonstrate the prestige of science and diffusion of scientific rationality. Therefore, world culture does not contradict the observed diversity in world society. Moreover, diversities make world cultural theory more valuable to explain the isomorphism of society. One important application is the explanation of "loosely coupling", For example, a country has to officially claim to support women rights to get global supports. However, the tradition in this country would seriously prohibit women rights in reality. In this case, formal pressure from world culture is counteracted by regional culture.

World society theory suggests a broader understanding in the analysis of rationalization. With this theory, a new measurement of rationalization can be determined.

Standardization

One concept that is closely-related to rationalization is standardization. Although setting standards has a long history, modern standards were initiated in the early 20th century in the

engineering and electrical industry in western countries (Loya and Boli 1999). In current world society, standardization spreads to every aspect of society. These standards are made by groups of experts with scientific and rational methods in neutral standards-making organizations. To join in the standards making process, companies pay membership fee to these organizations.

Based on the definition from Timmermans and Epstein (2010), standardization is the process of designing consistency based on common rules. In short, standardization is the formation of consistency and uniformity. This definition demonstrates its close relation to rationalization. Rational activities require achieving goals with efficient or "scientific" meaning. It is highly necessary to eliminate instability and irregularity. Thus, standards are designed to minimum effects of these factors. A standard administration for government is required to retain the continual operation of the government in case of personnel change. Legitimation of modern science is based on the replication of research process and falsifiable results achieved by standardization of the research method. Another example is the standardization of industry's administration. Scientific administration, which named by Taylor, strictly controls over every step of work to maximize efficiency. This leads to a system of work performance measurements from work duration to working emotion. On the other hand, standardization is the embodiment of a rational world culture—a ritual of universalism. The process of standardization begins with practical needs. Once it is made and achieved, it receives authority from the field. Standards in many cases are actually mandatory to obtain the legitimation of organization, although it may not be the most efficient way, which is described as "irrational rationality". Like science, standards become a source of legitimation, though its makers are those small, independent organizations. Science gains unprecedented power in modern society. Standardization, as an important outcome of scientific rationality, naturally receives this power.

In both senses, standardization is an important part of rationalization. It reflects the needs to rationally organize and legitimize the actors in this rationalized world.

Global data infrastructure

Standardization of the global data infrastructure began in the economic sector after World War II for post-war economic development. The United Nations System of National Accounts (UNSNA) provides the first complete accounting system that guides the definition and collection of various economic indicators across nations. Meanwhile, with increasing attention on development, the standardized measurements of demography, education, and health emerged and increased rapidly. However, development of a standardized measurement infrastructure is not unequal. Standardization of economic data relies heavily on the UNSNA, while indicators outside UNSNA are somewhat sparse and much less systematic. Global cultural and political data are less standardized, too. Compared with the focus on economic data, attention to cultural and political data is very weak. Babones (2004) argues this is because global data infrastructure is economically oriented. The primary mission is to promote the development of global economics. Political and cultural data are not very relevant to economic development and sometimes even refer to "embarrassing" social facts. In addition, the quite diverse, subjective nature of culture makes it hard to be standardized. Therefore, with resource and governmental cooperation, global IGOs provide more standardized, macro level developmental data. The micro level social survey, mostly conducted by NGOs and academia limited by resource and personnel, is less standardized.

The world is diverse, with significant geographical, developmental, and cultural differences. Standardized measurements are indispensable tools, which make globally comparable research possible. By standardized measurements, people quantify abstract concepts into concrete, comparable indicators, which makes comparison, calculation, and prediction across different

cultures possible. If people compare global economic development, in practice they are comparing *indicators* of economic development, such as GDP, GNP, export values or import values. These standardized indicators become the source of knowledge and shape world citizens' understanding of the world. Policies are made according to the analysis of these indicators. Empirical studies rely on these data. Everyday information, such as employment rates, oil prices, or bank interest rates, influence people's daily lives. After all, these measurements come from world society and conversely affect the activities of society. This would suggest that standardized measurements have an influential role in the determination of how a society is realized.

The growing application of standardized measurements is one way world development is progressing in parallel with the rationalization of the world system. Science, as the rational engine of knowledge and decision-making today, relies on these standardized data for research. Much global comparative research has been derived from global data sources. The availability and reliability of international data to some extent determines the research questions, designs, and methods of global comparative research. Therefore, the progression of rationalization would involve more scientific measurements. Moreover, in world cultural perspectives, standardization of scientific measurements is exemplified in an international data infrastructure implicitly assumes the universal prevalence of the latent concepts and universal comparability of the measurement constructs. Global standardization of the social survey as a valid instrument for taking measurements of populations anywhere in the world is a central assumption of the global standardization movement. The existence and expansion of the global data infrastructure represent a significant mechanism by which the world polity rationalizes the world system. By investigating the condition of indicators, the degree to which different countries and regions have been rationally incorporated into world society can be assessed. Therefore, the more rationalized a country, the

more measurements and data it will have and conversely, the more measurements of a country in the GSSI, the more rationalized that nation becomes in world society.

In this framework, I measure rationality by measuring national participation in the global data infrastructure. With this measurement, factors contribute to the condition of rationalization in the current world society, especially inequality in the GSSI, can be explored further. Although the global data infrastructure has greatly expanded in recent years, it does not yet cover all countries and societies. A country may be omitted in a single survey because of unexpected events, but if a country is absent in the whole global data infrastructure, there may be some structural reasons. Based on this argument, these four hypotheses are developed and tested:

Hypothesis 1: A country's connections to world society will be positively correlated with the timing of entry into GSSI.

Based on world culture theory, world society is a rationalized community consisting of rational actors. National-level connections to world society include its economic, cultural, diplomatic and political relationships with other actors. The nations with tier connection to this community are expected to have more powerful effects of these rational world cultural values (scientific rationality, individualism, equality, and universalism). Therefore, if this hypothesis stands, then nations more "central" to world society would be more active in global data infrastructure.

Hypothesis 2: The more central a country is in scientific networks, the more frequently it will be surveyed.

As discussed previously, scientific rationality is an essential feature of world culture. It is posited that the networks of the science community should play an important role in promoting the diffusion of world culture. It is through these networks that personnel flows, data are shared,

global collaborative scientific activities occur, and research results are tested and communicated. Therefore, it is expected that the more central a country is in global scientific networks, the more measurements it will receive in the global social survey infrastructure.

Hypothesis 3: Countries which have better economic and social developments will be overrepresented in the global social survey infrastructure.

The expansion of global measurement may also be driven by rational needs. For example, an increasing number of educational measurements can also be explained by their stated purpose of promoting enrollment rates and donations. Besides, in methodological perspectives, development provides the conditions of data collection, i.e. development of post service and the internet greatly facilitate survey conduction; an advanced highway system also helps with delivery of questionnaires. If this hypothesis holds true, we should expect a positive relationship between levels of national development and participation in global social surveys. Highly developed nations would be expected to have more global measurements than developing countries and undeveloped countries. It may be redundant to say that economic development contributes to booming standardized economic measurements. However, as discussed in the previous section, global social survey programs primarily focus on the welfare of humans rather than economic needs. Is this also the case in global social survey programs?

Hypothesis 4: Countries with different cultural traditions have substantially different risks of being surveyed, but religious effects may not be significant.

Influence of regional culture is well recognized. For example, Inghart (2004) found people from former communist societies have a relatively lower desire for self-explanation. Different cultural traditions divide world society into several coherent cultural groups, which may have different relations with, and exposure to, world culture. Are these differences significant? A

variable indicating the cultural group is included in the model. If the hypothesis is true, different cultural regions will have significantly different risks of being surveyed. In particular, countries of North Western Europe are expected to have the highest risks of participation in the GSSI, while countries from other cultural groups are hypothesized to have sufficiently lower risks.

The religious effects will be tested. Weber suggested the research direction at the end his thesis: "*the next task would be rather to show the significance of ascetic rationalism…its relations to humanistic rationalism. To the development of philosophical and scientific empiricism*" (1904/2004: 96). With the new measurement of rationalization, the religious factor will be revisited in this research. If Weber's thesis holds, the protestant countries should be surveyed more than other countries. Religion is a central feature of national cultures. However, their effects are expected to be different. With the fading of religious influence in the modern world, religious effects should be insignificant but cultural tradition should be significant.

CHAPTER 3. METHODS AND PROCEDURES

This chapter discusses data collection and analysis strategies. A census of the global social survey was collected. Based on this census, the analysis has two parts, a descriptive analysis to explore the expansion of GSSI and the pattern of rationalization of contemporary world, and an event history model to explore factors affecting the national participation of GSSI. Along this way, I highlighted one important process by which nation-states are rationalized and incorporated into world society that has, as yet, received little attention. A fundamental feature of this rationalization process is that societies (nation states) are measured and analyzed by standardized measurement instruments. This instrument embodies nearly all world cultural values—individualistic, scientific, universal (a single measuring device treats people as equals), and rationalization.

The unit of analysis in the descriptive analysis is the national social survey conducted in a single society in a single year. For example, since 58 countries and regions were sampled in wave five of the World Value Survey (WVS), there are 58 WVS survey measurements in the GSSI during that period. By doing this, both coverage and extent of survey programs are measured. "Society" is defined as a community with an autonomous government and distinctive culture, which has been recognized and legitimized by the international community. This includes most nation states and affiliated regions. Since borders and sovereignty are fluid, for example, in most global social survey data, there are two samples for East and West Germany before 1991 and one sample for the unified Germany thereafter, it requires special caution when merging time series data. The principle here is to retain as much information as possible. In the cases of split countries, missing values were filled by using the values of their predecessors. For example, missing values for Czech and Slovakia before 1993 were filled with the values of Czechoslovakia. For unified countries, the unified countries' names were used on their predecessors. For instance, all surveys

conducted in East and West Germany are recoded as Germany. The same rule applies to Northern Ireland and the United Kingdom in some surveys, which are not truly split. This provides Germany and the UK more measurements in the global social survey infrastructure. This is empirically true in time series and net-neutral to increasing number of countries which result from filling in values for split-nations.

In the event history model, only the data of sovereign nations which claimed independence before the onset of this study were used. In this way the effects of the sovereign on participation in GSSI were controlled for. This lead to a smaller sub-sample in the event history model, where the unit of analysis in event history model was the country.

Census

A targeted census was collected from the Overview of Comparative Surveys Worldwide of Leibniz-Institute for the Social Sciences (GESIS) to identify all surveys that met the definition. This is a thorough list of global social surveys from 1948 to 2014[4]. This list only includes surveys based national probability samples. I also supplemented this list with information provided by the Survey of International Social Surveys[5].

The global social data infrastructure is a collaborative network of social sciences, which embodies the world culture. The survey programs representing the infrastructure have several features. First, they are highly standardized. The very purpose of GSSI is to allow for direct comparisons between different countries and cultures and to provide a universal tool to measure the complex nature of society. High standardization is necessary to remove any measurement error due to cultural differences. Second, it is collaborative. The research questions, design, sampling,

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[4] http://www.gesis.org/en/institute/
[5] http://www.worldsocialscience.org/resources/survey-surveys/

analysis and in some cases funding operate under the collaboration of researchers from different societies and with different cultural backgrounds. This is a cultural communication in which western researchers plays an important role. Finally, its primary goal is development. As discussed in previous sections, development is the institutionalized commitment of world society. The global social survey program serves as the rational tool for this goal. This feature makes social survey programs different from commercial polls.

Three standards were considered in the collection, based on these features. First, survey programs are comparative and based on a standardized design. All social research is somewhat comparative, but not all programs are comparatively designed. The ex-ante designed survey program has standardized survey items with identical response categories, strict translation and trained interviewers, which distinguish it from the ex-post comparative study, i.e., the comparative study which converts non-standardized into comparable, standardized social data after data collection via data harmonization. Second, the survey programs should be publically accessible. This is not only a requirement of global collaboration, but also an implication of world culture. On the one hand, the survey data should be open to the science community and other world society agents; on the other hand, public accessibility is necessary for the disclosure of scientific results—a way of diffusing of world culture norms. Finally, general survey programs are selected. This research is a preliminary step of world society and global data. The focus is on the general topic of survey programs.

Twenty four survey programs containing 6976 surveys from 1948 to 2014 were selected. Table 1 shows the general information for these survey programs. For example, Pattern of Human Concerns Data (PHCD) which fielded surveys in nine countries (45 percent of 20 United Nations defined world regions) from 1957 to 1963. There were 15,286 respondents in nine societies

surveyed by this program, which accounts for 20 percent of the world's population in 2010. Table 1 shows some interesting phenomena of the global social survey infrastructure. For example, all nonwestern social survey programs emerged after 2000. This will be discussed in detail later.

Table 1. Descriptive information on ex-ante harmonized multi-country, multi-cultural and multi-regional (3M) social survey programs

Survey Program Name (label)	First Year	Last Year	Years in Time-series	Share of World Regions (#)[†]	Number of Societies	Number of Surveys	Completed Interviews (Num.)	Generalizable Share of World Population
Pattern of Human Concerns Data (PHCD)	1957	1963	7	45 (9)	10	12	15,286	0.28
Civic Culture Study (CCS)	1960	1960	1	25 (5)	5	5	4,891	0.09
Political Participation and Equality (PPE)	1966	1966	1	30 (6)	7	7	16,059	0.27
Eurobarometer (EUROB)	1972	2014	43	25 (5)	36	3588	21,100,000	0.09
World Values Survey (WVS)	1981	2014	34	90 (18)	99	243	341,271	0.89
European Values Study (EVS)	1981	2008	28	30 (6)	46	128	168,072	0.17
International Social Survey Program (ISSP)	1985	2013	29	70 (14)	50	736	1,004,210	0.66
Central and Eastern Eurobarometer (CEEB)	1990	1997	8	30 (6)	22	128	125,875	0.05
New European Barometer (NEB)	1991	2007	17	15 (3)	15	99	123,023	0.04
Latin Barometer (LATINB)	1995	2013	19	20 (4)	19	285	332,252	0.09
Afro Barometer (AFROB)	1999	2013	15	25 (5)	24	80	119,151	0.09
Voice of the People Surveys (VOTP)[‡]	2000	2013	14	100 (20)	103	571	535,159	0.89
Asian Barometer (ASIANB)	2001	2012	12	10 (2)	13	34	59,574	0.30
Pew Global Attitudes Surveys (PGAS)	2002	2013	12	90 (18)	60	330	329,806	0.83
European Social Survey (ESS)	2002	2014	11	25 (5)	36	160	33,480	0.11
Worldviews 2002 (WORLD)	2002	2002	1	25 (5)	7	7	9,263	0.09
Asia Barometer (ASIAB)	2003	2007	5	20 (4)	29	51	46,094	0.55
AmericasBarometer (AMERAB)	2004	2014	11	20 (4)	27	124	208,703	0.13
Arab Barometer (ARABB)	2006	2014	9	10 (2)	13	28	34,493	0.04
East Asia Social Survey (EASS)	2006	2012	7	5 (1)	4	16	40,151	0.22
Candidate Countries Eurobarometer (CCEB)	2001	2004	4	20 (4)	13	143	132,335	0.03
Transatlantic Trends Survey (TTS)	2003	2014	12	30 (6)	15	153	154,536	0.14
Attitudes toward Europe Study (ATE)	2008	2008	1	5 (1)	5	5	4,774	0.03
GSSI	**1948**	**2014**	**58**	**20**	**178**	**6933**	24,938,458	

Notes: Regions are based on the United Nations 20-region coding scheme. The VOTP survey program is an ex-ante, period harmonized survey program, but required ex-post harmonization to construct longitudinal dataset. The full name of Worldviews 2002 is Worldviews 2002: American and European Public Opinion on Foreign Policy. Societies are not only nation states, but also include oversee territories, autonomous territories, and several disputed territories, according to survey convention. Population share is based on 2010 world population.

Event history analysis

The event history model is an application of survival analysis in the social sciences. This model focuses on the time to the occurrence of events, i.e. survival time. Survival time is not always fully observed. One kind of incomplete observation is censoring, which occurs when the occurrences of events are unobserved during the research period. Right censoring happens when a case does not experience event until the termination of the study. This is the most common type of censoring in event history analysis. Interval censoring happens when the exact time of the occurrence is unknown. Left censoring means the event occurs before cases joined the research. The other type of incomplete observation is truncation. Left truncation happens when a case is already under risk before its entry into the study. Interval truncation, also called "gaps," means the subject leaves during the study, but returns later. Hence, a part of its event history is missing. Right truncation occurs when the sample is biased. The incomplete observation in event history data make some commonly used univariate statistics inappropriate. The traditional GLM model estimation does not apply either. Several assumptions of GLM model will be violated when it is applied to this type of data. For instance, the survival time may not be normally distributed. In addition, survival time is often tied. Data are tied when several cases experience the event at the same time. This causes problems when modeling with covariates in the GLM model. Therefore, the event history model designed for this kind of data is used this research.

Depending on the method of estimation, there are three types of estimation in survival analysis: (1) parametric estimation, (2) semi-parametric estimation, and (3) non-parametric estimation. In parametric estimation, the distribution function of the hazard rate is specified. If the choice of distribution function is appropriate, the parametric model may be more accurate. However, Steffensmeier and Jones (2004) found distribution of dependency time was very

sensitive to the model specification. A different set of independent variables may result in different hazard function. Also, as Steffensmeier and Jones discussed, determining the form of distribution is not always as important as finding the relationship between the hazard rate and independent variables. While this idea does not apply to all research, it is true for the present study. Thus, the more flexible cox proportional hazards model is considered.

The equation for the semi-parametric cox hazard model is:

$$h(t|x_j) = h_0(t)e^{x_j\beta_x} \qquad (1)$$

In the cox model, the likelihood ratio estimation of the conditional probability for each failure time is modeled. It is a ratio comparison between the alternative and null models. Therefore, the baseline hazard function is left unspecified. The intercept is absorbed into the unspecified baseline hazard function and, therefore, absent from the model. From this model, the effect is known for every unit change of the coefficient for the hazard ratio. Effects of covariates on the hazard function depend on the order of survival times.

Non-parametric estimation is also considered. As its name, the non-parametric analysis focuses on the nature of data rather than a modeling parametric. There is no model of non-parametric estimations. Nevertheless, they are helpful to describe and screen the data, especially when checking the assumption of the proportional hazard. In this analysis, the Kaplan-Meier estimator of the survival function will be utilized to describe the survival function and the log-rank test will be used to check the significant of regional difference of survival time.

Data collection

This research focuses on the methodological nature of social survey programs, i.e. how many countries are surveyed and how many surveys have been conducted, rather than the content of social surveys. Since most global social survey data are organized by single observations, data

collection in this research involved recording each conducted survey and creating systematic variables, such as wave, year, and sample size. Original documentation is always preferable when it is available, since it retains the most information. In instance where data documentation was absent, summarized statistics of data were used instead. Some data were merged, for example, all 184 single year data files for Eurobarometer from 1974 to 2012 were merged into an integrated data file before creating systematic variables. Also, some special methods were utilized in data collection: (1) documentations of some survey programs did not provide the exact year of survey. The first year was used as survey time in these cases. (2) In cases where wave survey (a single data collection) was unknown, a wave variable for each survey year was generated.

Dependent variable

The event history for each country in this research is the time from the onset of the study to the first time the country was measured by an international, comparative social survey program. The dependent variable is the hazard ratio. This is the ratio of hazard rate between the alternative and null models, which can be interpreted as the percent increase in rates at which events occur under the effects of the independent variable. For example, a hazard ratio equal to k means a country joins the GSSI at a rate (1-k) percent as large as the rate of baseline model, under the effects of the independent variables.

Independent variables

Culture. The religious variable comes from the 2005 Cross-National Socio-Economic and Religion Data, which is the combination of United Nations Development Report, CIA World Factbook and CIA International Religious Freedom report. This variable indicates the majority religion by the proportion of the population for each country. In this research, the original variable was recoded into a seven-category variable (0=Atheism, 1= Protestant, 2=Catholic, 3=Orthodox,

4=unspecified Christian, 5=Islam and 6=East religions and 7=other religious beliefs) to distinguish the religious differences in the contemporary world society. Although this is 2005 data, the religious compositions for most countries are assumed to be relatively constant across time.

Huntington (1996) created a classification of nine cultural groups: Protestant Europe, English-speaking, Catholic Europe, Confucian, Orthodox, Latin America, South Asia, Islamic and Sub-Saharan Africa. Since the analysis requires exclusive categories, a cultural variable is created with seven categories based on Huntington's classification and conventional categorization of regional culture: North and Western European ancestry, which includes the United States, Canada, Australia and New Zealand; South European ancestry; Eastern European ancestry; Latin America ancestry, including countries in Central and Caribbean America; East and South Asian Ancestry; Central-West Asia and North African Ancestry, which represents the traditional Muslim world; and the African Ancestry of the Sub-Saharan Africa.

Globalization. The KOF index of globalization is used to measure globalization. This is a 1-100 index which measures the economic, social and political globalization of 207 countries from 1970 to 2012. It is created by KOF[6] Swiss Economic Institute. It defines globalization as "the process of creating networks of connections among actors at multi-continental distances, mediated through a variety of flows including people, information, and ideas, capital and goods."(Dreher, Axel 2006). In particular, it measures social globalization in three categories: (1) personal contact, (2) information flows, and (3) cultural proximity. The KOF index is based on variables such as 'Trade in books', which measures the cultural interactions between countries, and the number of McDonalds and Ikeas per country, which measure the influence of mainstream culture. Thus, this index provides a broad measurement of economic, social, and political globalization.

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[4] "KOF" is the acronym for the German word "Konjunkturforschungsstelle", which means business cycle research institute. It is directly used.

Scientific networks. The first variable used to measure the scientific networks is the number of universities in each country. In the global scientific network, a university can be regarded as the nodes between knowledge and personnel transport. Therefore, the number of universities indicates the strength of a country's connection to the global scientific community. This variable was obtained from the Webometrics Ranking of World Universities. It provides the total number of universities in 207 nations and regions while most other data covers only the "top" universities. Ranked universities data are not used, since ranking results are subject to different ranking methods. One concern for this variable is it is a time-independent variable measured in 2015. It may not be appropriate to include in a longitudinal study. This is an expediency, due to the lack of historical data for number of universities. This variable is used with the assumption that the establishment of universities is closely related to the independence of countries, which means a majority of the universities in the selected countries for this study already existed before the onset of the study. Indeed, many universities were also established after this time, which leads to higher measurement for this variable. The interpretation of results from this variable should be with cautions.

Tertiary education enrollment rate from World Bank Development Indicators (WDI) is used to supplement this measurement. The tertiary education enrollment rate indicates the development status of higher education in the country. A higher tertiary education rate for a certain country will imply more education expenditure, more advanced construction of infrastructure, more educated population and, therefore, a more central position in global scientific networks.

Development. Total fertility rate and life expectancy measure the social development and GDP per capita quantify economic development. The measurements for social development come from the World Bank indicators. The total fertility rate data measure the number of children born

to a woman who survives through the children-bearing age and experiences the fertility rate corresponding to age. The total fertility rate usually has an inverted relationship with social development due to education, development of women rights, and urbanization. Life expectancy measures the possible life of a newborn under the assumption that mortality at birth is constant. A large value for life expectancy indicates high social development. The GDP per capita data comes from the WDI database and measures the gross domestic product in constant 2005 U.S. dollars.

Control variables

Three additional variables are included in the model to control for effects not covered by formal hypotheses. They are urbanization population, primary education enrollment rates, and population density.

Urbanization population. In many countries, especially in developing nations, rural populations are more difficult to access than the urban population due to the poor construction of infrastructure and education. In these cases, only an urban population will be surveyed, which influences the choice of the survey population. Therefore, in this analysis, it is posited that countries with a large rural population have a lower risk of being surveyed, and, correspondingly, countries with a larger urban population have a higher risk of being surveyed. The proportion of the urban population from World Bank Indictors is used to control for this effect.

Primary education enrollment rates. Based on the definition for the international standard classification of education, the primary education goal is to provide children with basic education in reading, writing, and mathematics. This implies taking primary education gives people the capability to take part in surveys. A higher primary education rate would enable more participation in surveys. Therefore, data of primary education enrollment rate from the World Bank

Indicators are applied to control for this effect. Due to serious missing values, literacy rate, which is a more straightforward measure of survey taking ability in the population, is not used.

Population density. Population density is also likely to have an effect on survey participation. It is particularly influential to several survey methods commonly used in the global social survey. For example, a face-to-face interview would be more difficult to conduct in regions with sparse populations. This could affect the choice of the survey population in the beginning of design. Therefore, population density is included in the model to control for the effects of population density. Population density data, which are from WDI, are calculated by midyear population divided by land area in square kilometers. The population includes all residents despite citizenship.

Survival analysis set

The world society literature suggests 1945, when the United Nation was established, as the watershed moment for the development of world culture. Many world cultural norms experienced increasing expansion after this year, including environmentalism (Frank et al 2000), human right protection (Burton and Tsutsui 2005), education (Meyer, 2000) and scientization (Boli and Tomas 1999). Globally standardized social measurements emerged during this period. The first global social survey, *How Nations See Each Other*, was conducted in 1948. So 1945 is used as the start year for this study. However, onset of the risk period is set to 1960 and the end time of this study is set in 2013, since most country attributes data are 1960 through 2013. The event is the first participation of the country in any selected social survey program. Since this model includes time-dependent variables, discrete multi-records for these data are employed, i.e. the event history for each case is divided into several, even time intervals. Each interval has a failure. The time variate covariates are assumed to be discrete and unchanged within each time interval. For example, the

KOF globalization index for the United States is 55.12 in the period 1960–1961, which is assumed to be constant in this year.

Missing values

Much statistical software performs automatic listwise deletion of missing values. This is problematic in the event history model for this research, since multi-records are utilized. Each observation represents a period of event history. Listwise deletion would lead to missing time periods and reduced sample size. Three steps are taken to deal with missing values in these data. First, non-imputable cases are defined as having all missing values in more than three independent variables. Such cases are dropped. Most missing values of this kind concentrate in small island countries. Dropping these cases reduces the sample size, but does not otherwise distort the estimated parameters. Second, linear interpolation is applied with forward and backward moving averages, lagged to 10 years, to impute missing values. Third, any remaining missing values in step two are filled with yearly and regionally averaged values. The widely used multiple imputation method is not compatible with the structure of these data, since the multi-record method requires data to be in a long form, while multiple imputation requires data in the wide form.

CHAPTER 4. ANALYSIS RESULTS

Descriptive analysis

A preliminary time series descriptive analysis shows a significant expansion of global social survey programs. In 1948, there was only one survey program with nine total surveys. By 2000, 1859 surveys from 14 survey programs had been conducted. This increase is even more striking in the 21st century, as shown in Figure 1[7]. After 2001, the number of surveys increased by 50 percent from 200 to more than 300. By 2013, 6237 surveys have been fielded by 24 social survey programs. Figure 2 shows the number of countries surveyed each year. There are three remarkable increases in the number of surveyed counties. The first increase occurred between 1990 and 1991, when more than 30 countries were surveyed in the following year, while less than 20 countries on average were surveyed previously. This period is marked by participation of former republics of the Soviet Union. The second phase of the increase occurred between 1998 and 2000, from 50 countries to more than 80 countries on average. And the third one happens in 2004, when more than 100 nations are surveyed per year thereafter. Most newly joining countries are small countries or autonomous regions. This explosion of surveyed countries needs more attention in future analysis. The expansion of the global social survey programs is also demonstrated by their conductors. From Table 1, all survey programs before 2000 were conducted in the Western world. After 2000, a number of survey programs were established in other regions. Many new social survey programs were initialized in the first 10 years of the 21st century. In general, data show the periodical expansion of global social survey programs.

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[7] Generally, the survey is intermittent, which means specific fluctuations in this figure are less informative. However, it still shows evidence of an increasing trend if we look at the general picture.

Smith (2010) describes the historical development of GSSI differently. He has the first phase covering the period prior to 1972. Most global social surveys conducted during this period were small ad hoc programs. He identifies the second period as spanning the period from 1973 to 2002. In this period, more global collaborations focusing on general and longitudinal surveys emerged. The ongoing third period started in 2002 in Smith's schema, marked with more systematic, more organized global social survey programs. A close look at the census in this research supports his chronology. As shown in the Table 2, prior to 1971 the global social survey programs were small-scale social surveys conducted between several nations. These survey programs were not longitudinal. The only exception was the Eurobarometer. Most existing global multi-cultural and longitudinal social survey programs emerged during the second period. All social survey programs emerging after 2002 were regional, multi-country survey programs. These survey programs, represented by Barometer surveys in Arab, Asian, and the Americas, imply a higher level of collaboration argued by Smith. The survey programs are no longer collaborative within single survey organizations, but collaborative by organizations from different regions. This also implies a cross-regional diffusion of scientific rationality into the regions traditionally defined as being in the periphery of world society.

Table 2: Period of GSSI.

Era one (Prior to 1972)	Era two (1973-2002)	Era three (After 2003)
Eurobarometer	European Values Study	Pew Global Attitudes Survey
Pattern of Human Concerns	World Values Survey	European Social Survey
Civic Culture Structure	International Social Survey	Arab barometer
Political Participation and Equality	Latino barometer	Americas barometer
How Nations See Each Other	Afro barometer	Asian Barometer
Attitudes toward Europe Study	Voice of the People	Worldviews 2002
	Asia barometer	East Asia Social Survey
	Central and Eastern Eurobarometer	Transatlantic Trends Survey
	New Europe Barometer	
	Candidate Countries Eurobarometer	

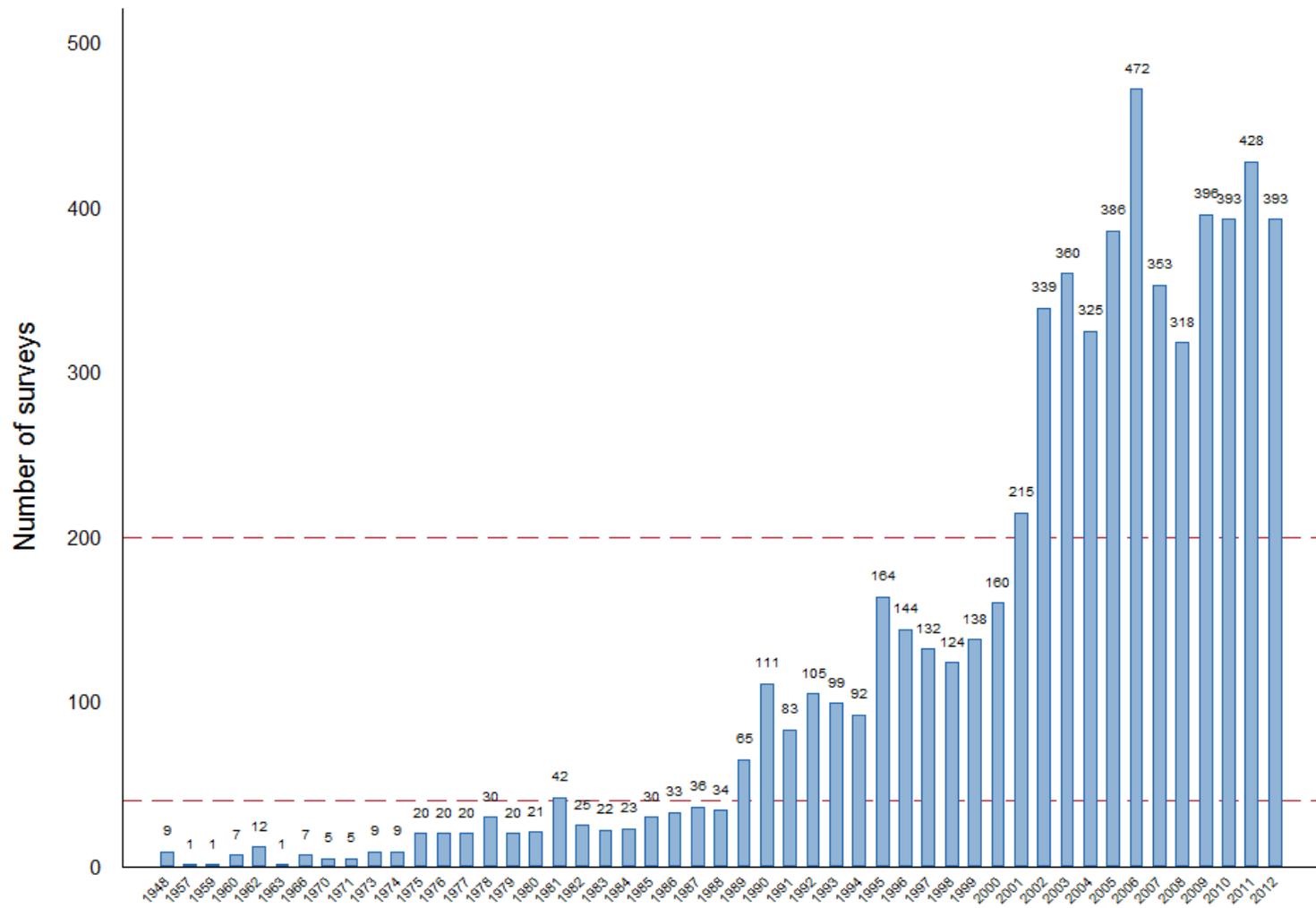**Note:** Time periods are based on Smith (2010).

Figure 1. Number of Fielded Surveys
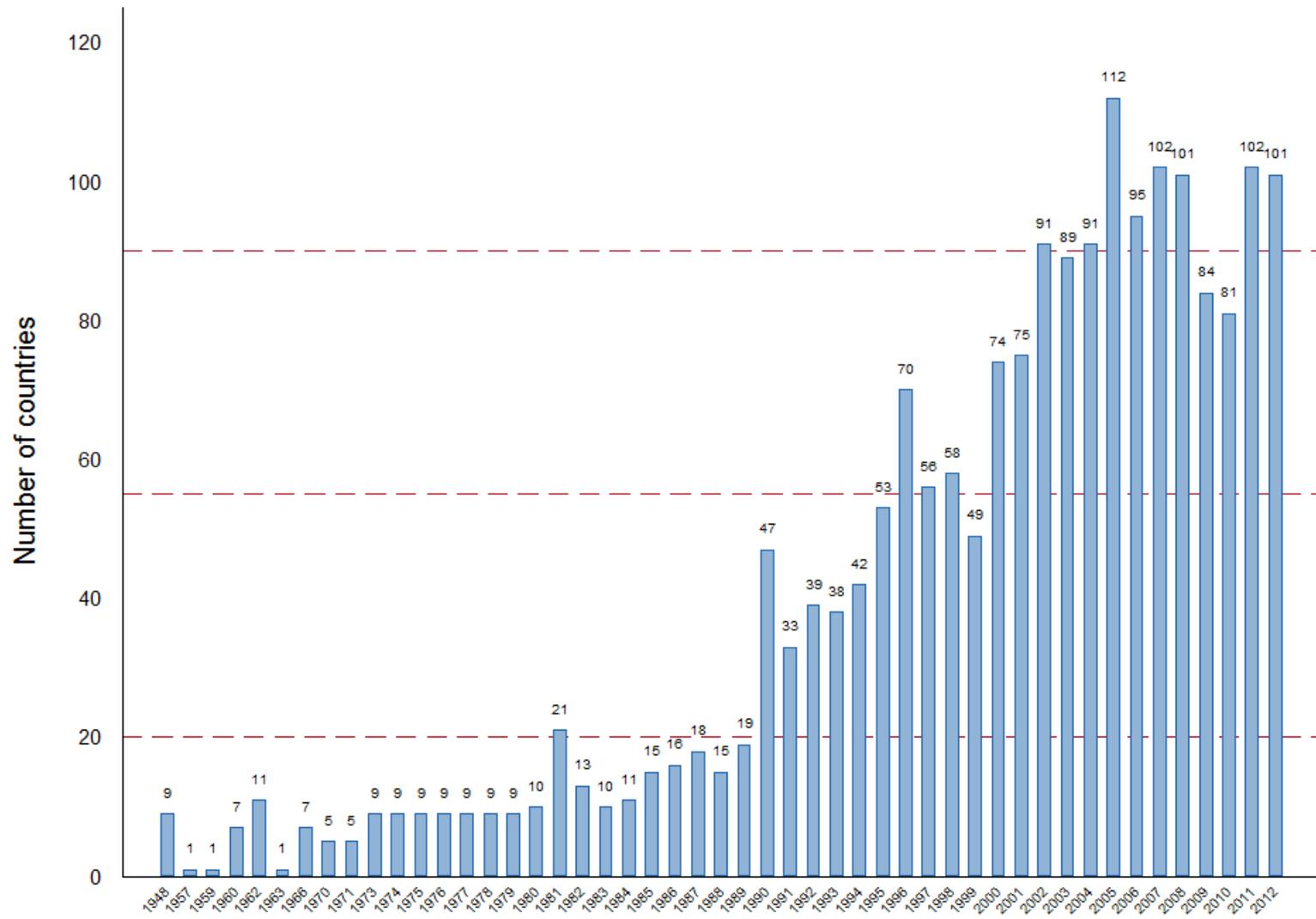
Figure 2. Number of Surveyed Countries

As noted in Figure 3, the number of surveys conducted in Europe, especially in countries of North and Western European ancestry, is far larger than the remainder of the world. Expansion of social survey programs first began in Northern and Western Europe ancestry countries in the early 1970s, followed by South and Eastern European countries during the 1990s. The beginning of standardized social surveys in Asia and Latin American occurred in the new century, followed by Africa. Differences in the number of fielded surveys between Western countries (as well as Eastern European countries) and the remainder of the world are becoming larger. This increasing gap is interesting, since based on both realism theory and institutionalism theory, the gap should be smaller, not only because the rising Asian and Latin American countries are catching up in economic and social development, but also because of the expansion world society. This difference needs further explanations.

However, the number of surveyewebed countries do not differ greatly between regions, as shown in Figure 4. The North-Western European countries experienced an earlier start and stability. Other regions experienced a greater increase later and soon matched the surveyed countries. The sharpest increase of surveyed countries occurred in Asia. Again, Figure 4 provides evidence of the explosive expansion of global social survey programs in the non-Western countries. On the other hand, it shows that the density of being surveyed in the North and western European countries is much larger when compared with the massive number of conducted surveys.

Figure 3. Number of Fielded Surveys by Cultural Ancestry
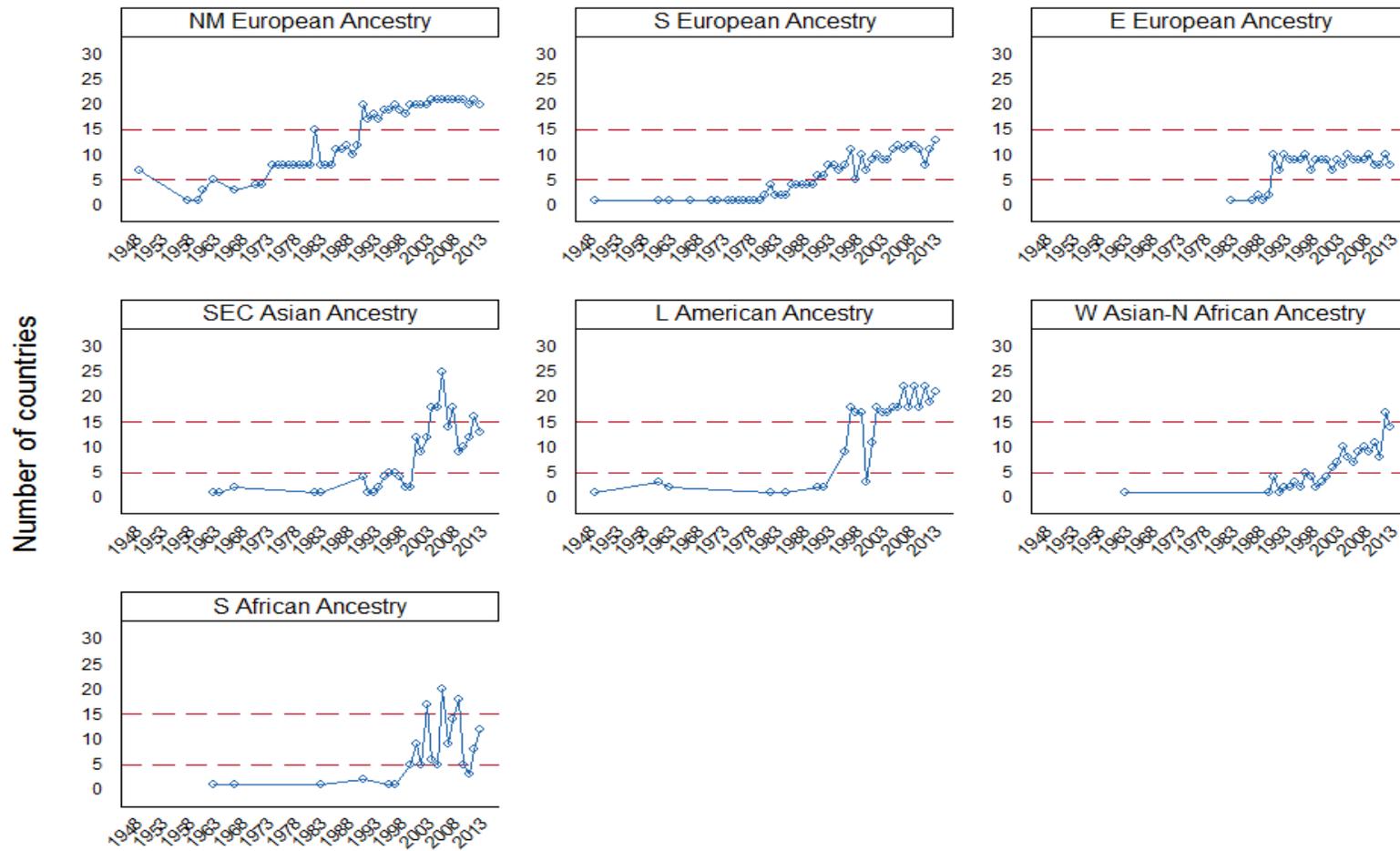
Figure 4. Number of Surveyed Countries by Cultural Ancestry
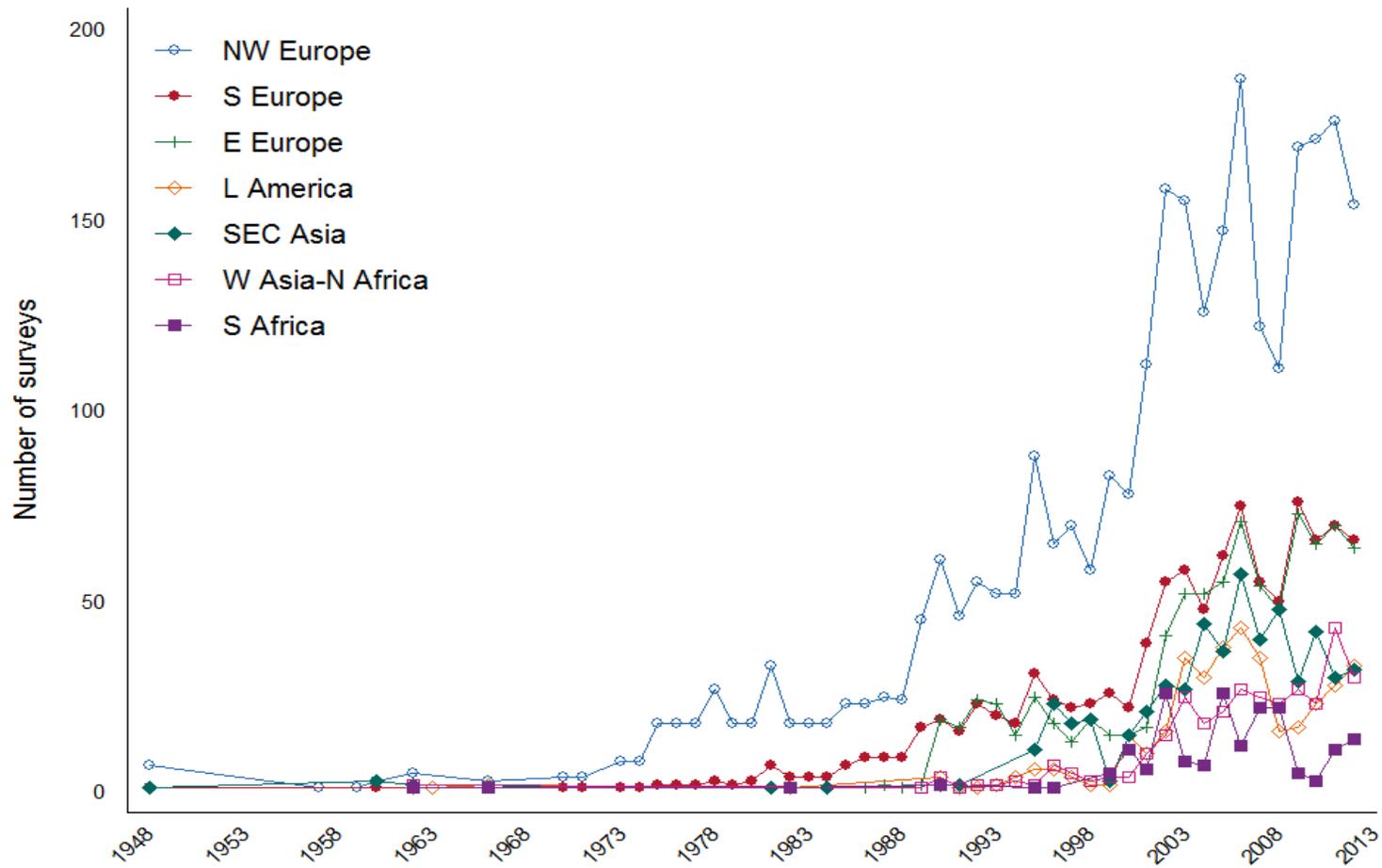
Among the survey programs selected in this research, the size of the Eurobarometer is massive (Figure 5[8]). From Eurobarometer, 3588 surveys have been conducted in 36 countries in 44 years. This is nearly half the total number of fielded surveys. On average, every member of Eurobarometer has been surveyed at least twice annually. The actual frequency is more intensive in recent years. For example, seven waves of surveys were conducted in 2001 for various topics from technologies to culture. Every year, many waves of Eurobarometer are conducted to investigate specific topics. The social survey has long been a regular tool for Europeans to understand their societies. In terms of sample size, the Eurobarometer has surveyed 42 percent of the total sample size by all social survey programs. Therefore, it is not surprising the Western countries occupied the list of most surveyed countries followed by east and south European countries. This result is more remarkable when the population and geographical area of Europe are considered. While this is only for Eurobarometer. It does not take into consideration the frequency of other survey programs, including two European-based programs—European Values Survey and the European Social Study. All the results manifest one fact—the global social survey programs are still very westernized and unequal.

During the past 60 years, out 235 world countries and regions, 154 are surveyed at least once. The process behind the expansion of the global social survey is the production and distribution of knowledge about world societies. This knowledge, comes from the standardized and scientific social survey, become people's knowledge about society. This is the expansion of rationalization, which is highly unbalanced. The Western world is still at the center. African world is in the periphery. Then, what factors contribute to this pattern? It is answered in the event history analysis that follows.

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[8] Only longitudinal survey programs present in this figure.
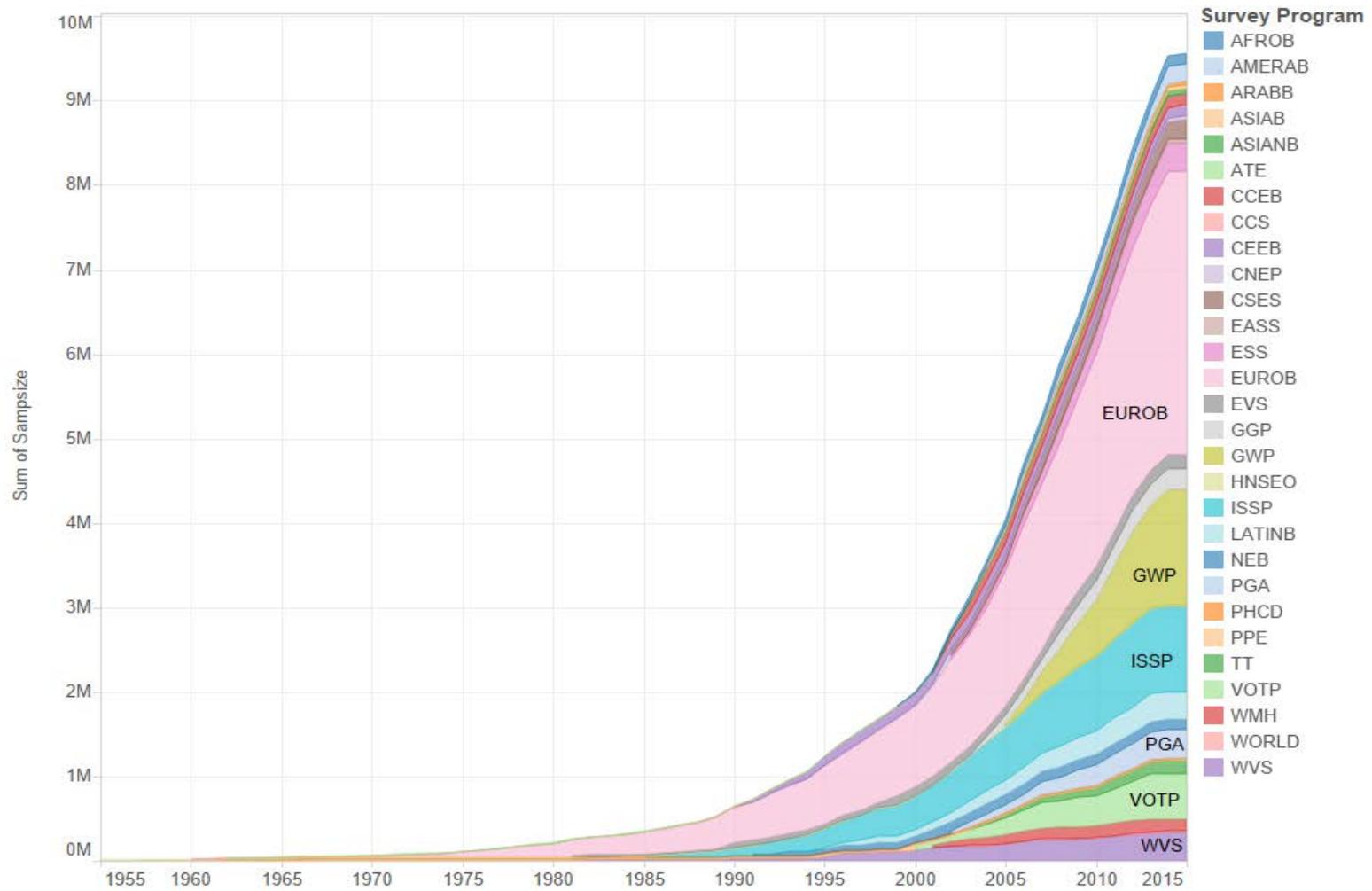
Figure 5. Cumulative Number of Sample Size by Program

Note: This figure is based on cumulative sample size of each survey program. Please see table one for the name of each survey program.

Figure 6. Spatial Distribution of GSSI, 1948-2013

Note: This map is based on number of fielded survey. A survey program can field multiple surveys in a single wave.

Event history analysis results

Survival time is the duration between the onset of the study and the occurrence of the event. There is a moderate, negative correlation between the survival time and GDP per capita, which indicates a higher GDP per capita is associated with a shorter survival time. Similarly, the correlations between life expectancy and globalization index against survival time are also moderately negative. Since fertility rate is negatively associated with development status, the correlation between fertility rates and survival time is positive, meaning that low fertility countries are at greater risk of being surveyed by comparative social survey programs. This finding shows evidence of the effects of social and economic development on the participation of GSSI. The correlations between scientific network indicators and survival time are also negative but substantially small. The result supports Hypothesis 4.

Table 3: Correlation matrix: Survival time and covariates

	Survival time	GDP per capita	Life expectancy	Fertility rates	KOF	Universities(#)	Tertiary enrollment rates
Survival time	1.00						
GDP per capita	-0.56	1.00					
Life expectancy	-0.48	0.69	1.00				
Fertility rates	0.54	-0.64	-0.81	1.00			
KOF	-0.45	0.76	0.71	-0.63	1.00		
Universities(#)	-0.26	0.00	0.14	-0.21	-0.09	1.00	
Tertiary education	-0.23	0.51	0.56	-0.56	0.50	0.15	1.00

Figure 7, which models the Kaplan-Meier estimation of the cumulative hazard function, indicates that an increase of cumulative hazard rate was especially pronounced after 1990. This is consistent with results reported earlier in the descriptive analysis. The GSSI was expanding during the past several decades and this expansion was particular fast after 1990, with many Asian, Latin, and Arabic countries joined in GSSI.
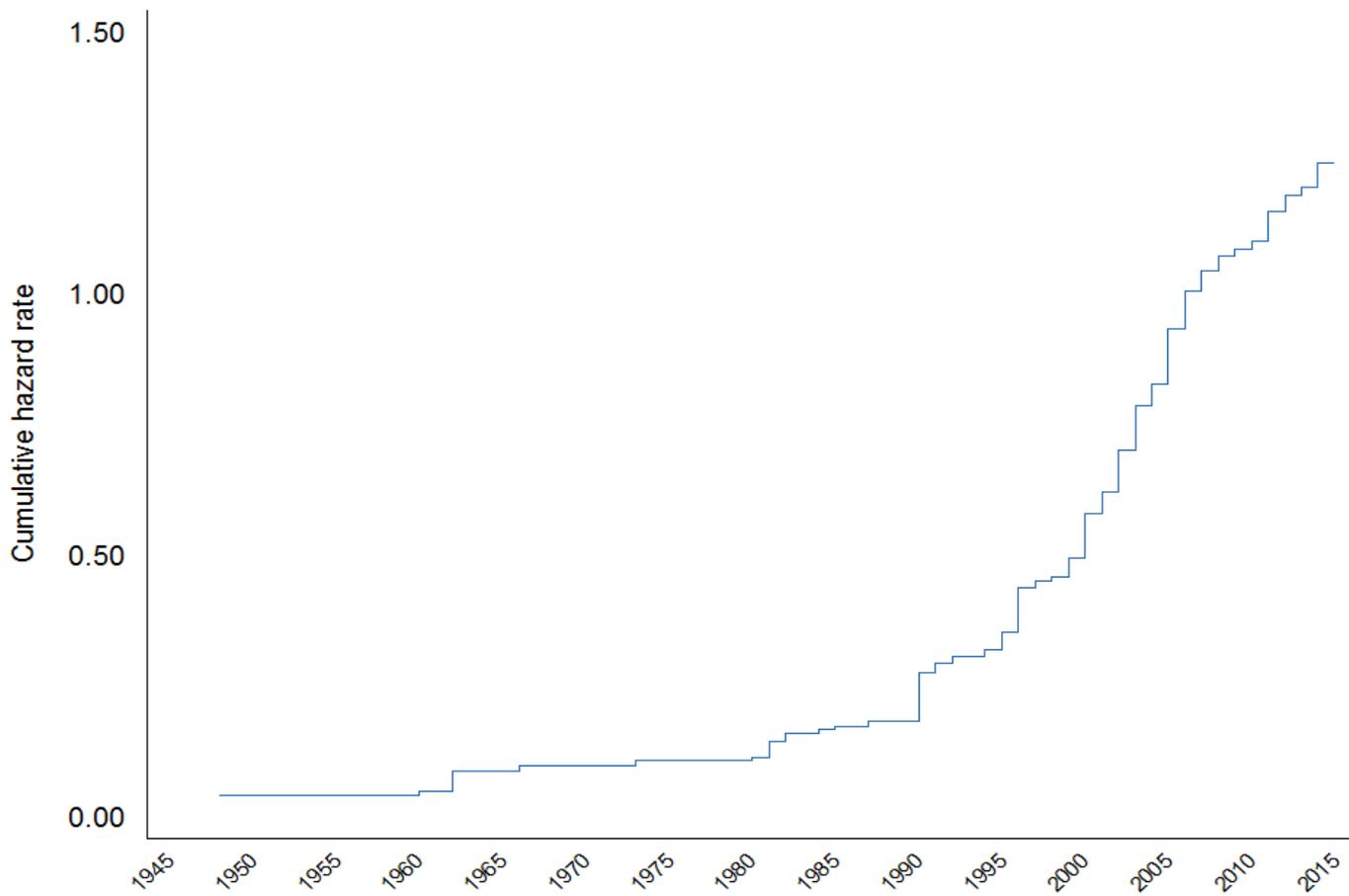
Figure 7. Cumulative hazard rate

The results of the event history analysis are reported in Table 4. A total of 3158 cases are included in the event history model. Among the 98 countries, six are right censored. The first four models measure the bivariate effects of each factor on hazard rates. Then each factor is combined into a single, integrated model to investigate the conditional effects of each predictor variable on the survival time of each country in the study. In the first model, the hazard ratio for GDP per capita is 1.089, which indicates every unit increase of GDP per capita is associated with an 8.9 percent higher risk of joining the GSSI. This is consistent with their correlations. But, in model five, when the globalization index is included, the hazard ratio becomes less than one, meaning that the relationship between GDP per capita and global social survey participation become negative. The two variables for social development are insignificant. The hazard ratio of life expectancy is insignificant in all models while the hazard ratio for the fertility rate is significant in the first model, which included no other covariates, but is no longer significant when the globalization index is included as an additional covariate.

The hazard ratio of globalization index is significant in all model. Every unit increase of globalization index is associated with a 4.5 percent higher hazard rate to participate in global social survey programs, which does not look large. However, the effect of globalization reverses the direction of development. This means that poor countries with strong global connections are more likely to be surveyed because of their relations to the world society, net of their economic and social development status. According to the meaning of the KOF globalization index, this connection includes trade, communication, and global aid, to name a few. This explains why many undeveloped African countries are surveyed earlier. Many social survey programs are dedicated to analyzing conditions there to facilitate global financial and humanity aid.

The effect of the cultural variable, which measures cultural tradition, supports Hypothesis 4. The hazard ratios for countries with mainly Asian culture, Latin culture and Eastern European culture are insignificant. It shows strikingly low risk of participation of the countries from Western Asian and Northern African (the MENA) cultural ancestry and Southern African cultural ancestry to global social survey programs. When compared with Northern and Western European cultures, the hazard rate of the MENA countries is 0.09, while this number is 0.075 for Southern African culture. This is evidence of cultural 'penalty' for non-western nations. The Western Asian and Northern African culture, which represents MENA cultural tradition, and Southern African ancestry, which represents the indigenous African cultural tradition, have significantly less participations in the global social survey programs.

The models show insignificant effect of the religious variable. Again, with a new measurement, Weber's religious account of rationalization fails to find support. However, this does not mean Weber's thesis is incorrect. This is evidence that in contemporary world, religious beliefs are not the primary driver of world-level rationalization. In this research, the religious component in Hypothesis 4 is not supported. One interesting finding is the difference between Islam and MENA cultures in this model. These two cultural terms have substantial overlap. In fact, Islam is so important and ubiquitous that it nearly perfectly overlaps with the whole of Arabia in some cases. However, these two variables tell different stories. Islamic culture is insignificant in influencing participation, but MENA culture is significant. Then, what features of culture have the strongest association with scientific rationality? One conjecture that may answer this question is the indigenous culture tradition in the Middle-East, which has been slower to embrace and adopt many elements of modern scientific rationality. Further analysis of this question requires thorough inspection of Muslim culture, which is beyond the scope of this research.

This hazard models indicate that number of universities is positively associated with the hazard rate of participation in the global social survey infrastructure. This finding partly supports Hypothesis 2. The effect of tertiary enrollment rates is insignificant for both models. One implication of this finding is that rationalization may occur in a more diffuse, rather than interactive, way. Scientific rationality is "exported" in one-directional—from central countries to periphery countries—through products, aid packages, and diplomatic activities, rather than through global collaboration among members of the science community. However, caution is noted for this finding, since the effects are quite small. The hazard ratio of the number of the universities is 1.001, which means each additional university is anticipated to increase the hazard rate of participating in global social survey programs by with a tenth of a percent.

In total, the results obtained from the event history models support Hypothesis 1, which indicates that a country's connections to world society are positively associated with its participation in GSSI. The effect of globalization is not only significant but also reverses direction of development factors. It fails to support Hypothesis 3, which demonstrates a country's level of development has insignificant relationship with participation in GSSI. The significantly underrepresented participations of countries from Middle-Eastern and North African culture and South African culture support Hypothesis 4. The effect of scientific networks is positive but very weak. Future research utilizing additional data would shed light on these findings.

Table 4: Cox proportional hazard model: Hazard rates regressed on covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Development							
GDP per capita (log)	1.089				0.905	0.883	0.920
	(0.171)				(0.158)	(0.173)	(0.178)
Fertility rate (FTR)	0.602***				0.591***	0.727	0.769
	(0.081)				(0.082)	(0.143)	(0.154)
Life expectancy	0.975				0.954	0.954	0.954
	(0.026)				(0.027)	(0.036)	(0.037)
Globalization							
Globalization index		1.055***			1.045**	1.046*	1.047*
		(0.012)			(0.014)	(0.019)	(0.019)
Culture							
N-W European Ancestry			ref			ref	ref
			(.)			(.)	(.)
S European Ancestry			1.654			2.622	2.932
			(1.038)			(1.797)	(2.005)
E European Ancestry			0.498			0.939	0.815
			(0.385)			(0.791)	(0.710)
SEC Asian Ancestry			0.308			0.600	0.464
			(0.205)			(0.473)	(0.393)
L American Ancestry			0.244**			0.612	0.666
			(0.132)			(0.413)	(0.458)
W Asia-N African Ancestry			0.041***			0.110**	0.097**
			(0.029)			(0.090)	(0.082)
S African Ancestry			0.029***			0.074**	0.076*
			(0.021)			(0.073)	(0.079)
Protestant			ref			ref	ref
			(.)			(.)	(.)
Atheism			2.067			2.615	1.720
			(1.768)			(2.274)	(1.549)
Catholic			1.220			0.948	1.026
			(0.638)			(0.510)	(0.558)

Table 4: Cox proportional hazard model: Hazard rates regressed on covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Orthodox				1.453		1.227	1.332
				(1.231)		(0.990)	(1.109)
Christian (Unspecified)				1.368		1.434	1.709
				(1.011)		(1.066)	(1.297)
Muslim				0.431		0.320	0.396
				(0.306)		(0.238)	(0.301)
East				0.262		0.196	0.328
				(0.225)		(0.176)	(0.310)
Other				2.749		1.574	1.878
				(2.744)		(1.620)	(1.960)
Scientific networks							
Number of universities					1.001***		1.001**
					(0.000)		(0.000)
Tertiary education enrollment rate					1.005		1.001
					(0.008)		(0.011)
Control variables							
Population density	1.003*	1.004**	1.004**	1.005***	1.002	1.003	1.004*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Urban population	1.013	1.004	1.027**	1.025***	1.008	1.015	1.018
	(0.008)	(0.007)	(0.009)	(0.007)	(0.008)	(0.011)	(0.012)
Primary education enrollment rate	0.996	1.005	0.990	1.002	0.999	0.985	0.984
	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)	(0.008)	(0.008)
AIC	634.76	636.15	609.12	647.63	625.95	605.80	602.61

Notes: "Protestant" is the reference group. "North and Western European ancestry" is the reference group. Excluding the Eurobarometer from the analysis (Model 7) yielded similar results.

CHAPTER 5. DISCUSSION

In this research, world society theory was used to explore rationalization of world development. Rationalization is explored using the global social survey program as the measurement. The descriptive analysis shows the striking expansion of global social survey programs, which reflects a rapid rationalization of modern society. This expansion has occurred in a decidedly unequal way. The developed countries of North-western European ancestry were the first to join the GSSI followed more recently by significant increase in participation from countries in Asia, Latin America, and Africa. At present, Western countries are far more extensively surveyed than countries from other cultural traditions. The interest of world culture is turning to these developing countries, which manifests a mode of value-oriented diffusion in the expansion of rationalization. This feature distinguishes the mode of rationalization in modern society from the mode of practically oriented structuration in Weberian and post-Weberian theories.

Event history analysis supports this idea. Connection to world society, i.e. economic, cultural, and political connection to world society, which determines the intensity of world cultural influences, is a more important determinant of participation in GSSI than a country's level of development. This reflects the diffusion of formal influences from the world culture. This diffusion process is perhaps one-directional, as seen by the effects of scientific networks. However, this process is not without interaction or conflict. As indicated by the results, the Muslim world continues to be underrepresented in the GSSI. The regional culture under the global diffusion of scientific rationality merits further research. According to the data, there is an interesting discrepancy in GSSI participation affected by Islamic culture and the larger culture of the Middle-East and North Africa. An analysis of the Middle-East, including its history, tradition, and influence of Islamic culture would be necessary to understand this discrepancy.

The main innovation for this research is the development of a novel measure of scientific rationality in world society. It is proposed that standardized social survey is a useful measurement of scientific rationality in modern world society. This implies people's efforts to quantify, understand, and control abstract social facts. Rather than the conventional measurement in literature, such as bureaucratic organizations and standards, the measure introduced in this research fits the diverse nature of modern world society, as more and more actors (newly formed countries, international non-governmental organizations, governmental organizations, etc.) are integrated into the world society in response to decolonization in the post-war era. With this measurement, a pattern of rationalization is depicted in the contemporary world society and several hypotheses are tested, including a revisiting of classic Weberian theory, which contributes to the rationalization literature.

Limitation

The missing values are the main concern of this research. Due to differences in levels of developments, change of governments, and related factors, many countries have a large number of missing values. This is especially the case for the small island countries. Dealing with missing values leads to a reduction of the sample size and choice of alternative proxies, which may compromise the reliability of the findings. Further research with better measurements is expected to test the findings from this research. Interestingly, the missing values indicate the incompleteness of standardized measurements. The patterns and implications of missing values in global standardized measurement can be a further vocal point of rationalization research.

REFERENCES

Babones, S. J. (2013). Methods for Quantitative Macro-Comparative Research: Sage Publications.

Beckfield, J. (2003). Inequality in the world polity: The structure of international organization. American Sociological Review, 401-424.

Beckfield, J. (2010). The Social Structure of the World Polity. American Journal of sociology, 115(4), 1018-1068.

Blossfeld, H. P., Golsch, K., & Rohwer, G. (2007). Event History Analysis with Stata: Lawrence Erlbaum Associates.

Boli, J., & Thomas, G. M. (1997). World culture in the world polity: A century of international non-governmental organization. American Sociological Review, 171-190.

Boli, J., & Thomas, G. M. (1999). Constructing world culture: International nongovernmental organizations since 1875: Stanford University Press.

Buchanan, W., Cantril, H., & Zerega, V. V. S. (1973). How nations see each other: A study in public opinion: Greenwood Press.

Buttel, F. H. (2000). World Society, the Nation-State, and Environmental Protection: Comment on Frank, Hironaka, and Schofer. American Sociological Review, 65(1), 117-121.

Cleves, M. An introduction to survival analysis using Stata".

Delacroix, J., Nielsen, F., xe, & ois. (2001). The Beloved Myth: Protestantism and the Rise of Industrial Capitalism in Nineteenth-Century Europe. Social Forces, 80(2), 509-553.

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. American Sociological Review, 48(2), 147-160.

Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. Applied Economics, 38(10), 1091-1110.

Drori, G. S. (2003). Science in the modern world polity: Institutionalization and globalization.

Frank, D. J., Hironaka, A., & Schofer, E. (2000). The Nation-State and the Natural Environment over the Twentieth Century. American Sociological Review, 65(1), 96-116.

Frank, D. J., & Meyer, J. W. (2002). The Profusion of Individual Roles and Identities in the Postwar Period. Sociological Theory, 20(1), 86-105.

Guillen, M. F. (2001). Is Globalization Civilizing, Destructive or Feeble? A Critique of Five Key Debates in the Social Science Literature. Annual Review of Sociology, 27, 235-260.

Habermas, J. (1985). The theory of communicative action, Volume 2: Lifeworld and system: A critique of functionalist reason.

Hafner, x, Burton, E., xa, M, & Tsutsui, K. (2005). Human Rights in a Globalizing World: The Paradox of Empty Promises. American Journal of sociology, 110(5), 1373-1411.

Harkness, J. A., Braun, M., Edwards, B., Johnson, T. P., Lyberg, L., Mohler, P. P., et al. (2010). Survey methods in multinational, multiregional, and multicultural contexts: Wiley Hoboken, NJ.

Hughes, M. M., Peterson, L., Harrison, J. A., & Paxton, P. (2009). Power and relation in the world polity: The INGO Network Country Score, 1978–1998. Social Forces, 87(4), 1711-1742.

Inglehart, R., & Baker, W. E. (2000). Modernization, Cultural Change, and the Persistence of Traditional Values. American Sociological Review, 65(1), 19-51.

Inglehart, R., & Welzel, C. (2005). Modernization, cultural change, and democracy: The human development sequence: Cambridge University Press.

Kalberg, S. (1980). Max Weber's Types of Rationality: Cornerstones for the Analysis of Rationalization Processes in History. American Journal of sociology, 85(5), 1145-1179.

Kalberg, S. (1990). The Rationalization of Action in Max Weber's Sociology of Religion. Sociological Theory, 8(1), 58-84.

Levine, D. N. (1981). Rationality and Freedom: Weber and Beyond*. Sociological Inquiry, 51(1), 5-25.

Meyer, J. W. (2010). World Society, Institutional Theories, and the Actor. Annual Review of Sociology, 36, 1-20.

Meyer, J. W., Boli, J., Thomas, G. M., & Ramirez, F. O. (1997). World society and the nation-state. American Journal of sociology, 103(1), 144-181.

Meyer, J. W., & Jepperson, R. L. (2000). The 'actors' of modern society: The cultural construction of social agency. Sociological Theory, 18(1), 100-120.

Meyer, J. W., Ramirez, F. O., Soysal, Y. N., x1e, & lu. (1992). World Expansion of Mass Education, 1870-1980. Sociology of Education, 65(2), 128-149.

Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. American Journal of sociology, 83(2), 340-363.

Olzak, S. (1989). Analysis of Events in the Study of Collective Action. Annual Review of

Sociology, 15, 119-141.

Paxton, P., Hughes, M. M., Reith, N., Sorensen, J., & Soule, S. (2015). Extending the INGO Network Country Score, 1950–2008. Sociological Science, 2, 287-307.

Polillo, S., Guill, xe, n, M., xa, & F. (2005). Globalization Pressures and the State: The Worldwide Spread of Central Bank Independence. American Journal of sociology, 110(6), 1764-1802.

Ritzer, G. (1975). Professionalization, bureaucratization and rationalization: the views of Max Weber. Social Forces, 53(4), 627-634.

Ritzer, G. (1998). The McDonaldization thesis: Explorations and extensions: Sage.

Ritzer, G., & Goodman, D. J. (1996). Classical sociological theory: McGraw-Hill New York.

Schofer, E., & Meyer, J. W. (2005). The worldwide expansion of higher education in the twentieth century. American Sociological Review, 70(6), 898-920.

Smith, A. D. (1990). Towards a global culture? Theory, Culture and Society, 7(2-3), 171-191.

Strang, D. (1990). From Dependency to Sovereignty: An Event History Analysis of Decolonization 1870-1987. American Sociological Review, 55(6), 846-860.

Thompson, J. B. (1983). RATIONALITY AND SOCIAL RATIONALIZATION: AN ASSESSMENT OF HABERMAS'S THEORY OF COMMUNICATIVE ACTION. Sociology, 17(2), 278-294.

Timmermans, S., & Epstein, S. (2010). A World of Standards but not a Standard World: Toward a Sociology of Standards and Standardization. Annual Review of Sociology, 36(ArticleType: research-article / Full publication date: 2010 / Copyright © 2010 Annual Reviews), 69-89.

Weber, M. The Protestant ethic and the spirit of capitalism : the Talcott Parsons translation interpretations / Max Weber ; edited by Richard Swedberg.

Weber, M. (2009). From Max Weber: essays in sociology: Routledge.

Table A1: Independent variables

Variable	Definition	Data source	Type
GDP per capita	GDP per capita (constant 2005 US dollar), log transformed	World Development Indicators	Continuous, time-dependent
Fertility	Fertility rate, total (births per women)	World Development Indicators	Continuous, time-dependent
Life expectancy	Life expectancy at birth, total (years)	World Development Indicators	Continuous, time-dependent
KOF index	KOF globalization index	KOF index from Swiss Federal Institute of Technology in Zurich	Continuous, time-dependent
Religion	religious beliefs	Cross-National Socio-Economic and Religion Data, 2005	Categorical, time-independent
Regional culture	Regional cultural tradition	Recoded from UN region categories and Huntington's cultural groups	Categorical, time-independent
Tertiary education	Tertiary education enrollment rates	World Development Indicators	Continuous, time-dependent
Number of universities	Total number of universities in 2015	Webometrics Ranking of World Universities	Continuous, time-independent

Table A2: Control variables

Variable	Definition	Data source	Type
Population density	Population density (people per sq. km of land area)	World Development Indicators	Continuous, time-dependent
primary education	primary education enrollment rates	World Development Indicators	Continuous, time-dependent
Urbanization	Urban population (% of total)	World Development Indicators	Continuous, time-dependent

Table A3: Country list of event history model

country	ISO country codes	Year of entry	Region	Cultural ancestry	Religion	Survival time
Afghanistan	AFG	2003	Southern Asia	SEC Asian Ancestry	Muslim	43
Albania	ALB	1991	Southern Europe	S European Ancestry	Muslim	31
Argentina	ARG	1984	South America	L American Ancestry	Catholic	24
Australia	AUS	1981	Australia and New Zealand	NM European Ancestry	Catholic	21
Austria	AUT	1966	Western Europe	NM European Ancestry	Catholic	6
Belgium	BEL	1962	Western Europe	NM European Ancestry	Catholic	2
Benin	BEN	2005	Western Africa	S African Ancestry	Catholic	45
Bhutan	BTN	2005	Southern Asia	SEC Asian Ancestry	East	45
Bolivia	BOL	1996	South America	L American Ancestry	Catholic	36
Bulgaria	BGR	1990	Eastern Europe	E European Ancestry	Orthodox	30
Burkina Faso	BFA	2007	Western Africa	S African Ancestry	Muslim	47
Cambodia	KHM	2004	South-Eastern Asia	SEC Asian Ancestry	East	44
Cameroon	CMR	2000	Middle Africa	S African Ancestry	Catholic	40
Canada	CAN	1981	Northern America	NM European Ancestry	Catholic	21
Chad	TCD		Middle Africa	S African Ancestry	Muslim	
Chile	CHL	1990	South America	L American Ancestry	Catholic	30
China	CHN	1990	Eastern Asia	SEC Asian Ancestry	Atheism	30
Colombia	COL	1996	South America	L American Ancestry	Catholic	36
Congo Republic	COG	2006	Middle Africa	S African Ancestry	Catholic	46
Costa Rica	CRI	1996	Central America	L American Ancestry	Catholic	36
Cote d'Ivoire	CIV	2002	Western Africa	S African Ancestry	Muslim	42
Cuba	CUB	1960	Caribbean	L American Ancestry	Catholic	0

Table A3: Country list of event history model

Cyprus	CYP	1996	Western Asia	W Asian-N African Ancestry	Orthodox	36
Democratic Republic of the Congo	COD		Middle Africa	S African Ancestry	Catholic	
Denmark	DNK	1973	Northern Europe	NM European Ancestry	Protestant	13
Dominican Republic	DOM	1996	Caribbean	L American Ancestry	Catholic	36
Ecuador	ECU	1996	South America	L American Ancestry	Christian (Unspecified)	36
Egypt	EGY	2001	Northern Africa	W Asian-N African Ancestry	Muslim	41
El Salvador	SLV	1996	Central America	L American Ancestry	Catholic	36
Ethiopia	ETH	2005	Eastern Africa	S African Ancestry	Muslim	45
Finland	FIN	1981	Northern Europe	NM European Ancestry	Protestant	21
France	FRA	1962	Western Europe	NM European Ancestry	Catholic	2
Gabon	GAB	2006	Middle Africa	S African Ancestry	Christian (Unspecified)	46
Germany	DEU	1960	Western Europe	NM European Ancestry	Catholic	0
Ghana	GHA	1999	Western Africa	S African Ancestry	Christian (Unspecified)	39
Greece	GRC	1980	Southern Europe	S European Ancestry	Orthodox	20
Guatemala	GTM	1996	Central America	L American Ancestry	Catholic	36
Guinea	GIN		Western Africa	S African Ancestry	Muslim	
Honduras	HND	1996	Central America	L American Ancestry	Catholic	36
Hungary	HUN	1982	Eastern Europe	E European Ancestry	Catholic	22
Iceland	ISL	1981	Northern Europe	NM European Ancestry	Protestant	21
India	IND	1962	Southern Asia	SEC Asian Ancestry	East	2
Indonesia	IDN	2001	South-Eastern Asia	SEC Asian Ancestry	Muslim	41
Iraq	IRQ	2004	Western Asia	W Asian-N African Ancestry	Muslim	44
Ireland	IRL	1973	Northern Europe	NM European Ancestry	Catholic	13

Table A3: Country list of event history model

Israel	ISR	1962	Western Asia	W Asian-N African Ancestry	Other	2
Italy	ITA	1960	Southern Europe	S European Ancestry	Catholic	0
Japan	JPN	1966	Eastern Asia	SEC Asian Ancestry	Atheism	6
Jordan	JOR	2001	Western Asia	W Asian-N African Ancestry	Muslim	41
Laos	LAO	2004	South-Eastern Asia	SEC Asian Ancestry	East	44
Lebanon	LBN	2002	Western Asia	W Asian-N African Ancestry	Muslim	42
Liberia	LBR	2008	Western Africa	S African Ancestry	Christian (Unspecified)	48
Libya	LBY	2014	Northern Africa	W Asian-N African Ancestry	Muslim	54
Luxembourg	LUX	1962	Western Europe	NM European Ancestry	Catholic	2
Madagascar	MDG	2005	Eastern Africa	S African Ancestry	Christian (Unspecified)	45
Malaysia	MYS	2000	South-Eastern Asia	SEC Asian Ancestry	Muslim	40
Mali	MLI	2000	Western Africa	S African Ancestry	Muslim	40
Mauritania	MRT		Western Africa	S African Ancestry	Muslim	
Mexico	MEX	1960	Central America	L American Ancestry	Catholic	0
Mongolia	MNG	2003	Eastern Asia	SEC Asian Ancestry	East	43
Morocco	MAR	2001	Northern Africa	W Asian-N African Ancestry	Muslim	41
Myanmar	MMR	2003	South-Eastern Asia	SEC Asian Ancestry	East	43
Nepal	NPL	2005	Southern Asia	SEC Asian Ancestry	East	45
Netherlands	NLD	1962	Western Europe	NM European Ancestry	Atheism	2
New Zealand	NZL	1991	Australia and New Zealand	NM European Ancestry	Protestant	31
Nicaragua	NIC	1996	Central America	L American Ancestry	Catholic	36
Niger	NER		Western Africa	S African Ancestry	Muslim	

Table A3: Country list of event history model

Nigeria	NGA	1962	Western Africa	S African Ancestry	Muslim	2
Norway	NOR	1981	Northern Europe	NM European Ancestry	Protestant	21
Oman	OMN		Western Asia	W Asian-N African Ancestry	Muslim	
Pakistan	PAK	1997	Southern Asia	SEC Asian Ancestry	Muslim	37
Panama	PAN	1962	Central America	L American Ancestry	Catholic	2
Paraguay	PRY	1995	South America	L American Ancestry	Catholic	35
Peru	PER	1995	South America	L American Ancestry	Catholic	35
Philippines	PHL	1991	South-Eastern Asia	SEC Asian Ancestry	Catholic	31
Poland	POL	1987	Eastern Europe	E European Ancestry	Catholic	27
Portugal	PRT	1985	Southern Europe	S European Ancestry	Catholic	25
Romania	ROU	1990	Eastern Europe	E European Ancestry	Orthodox	30
Russia	RUS	1990	Eastern Europe	E European Ancestry	Orthodox	30
Saudi Arabia	SAU	2003	Western Asia	W Asian-N African Ancestry	Muslim	43
Senegal	SEN	2002	Western Africa	S African Ancestry	Muslim	42
South Africa	ZAF	1982	Southern Africa	S African Ancestry	Christian (Unspecified)	22
South Korea	KOR	1982	Eastern Asia	SEC Asian Ancestry	Atheism	22
Spain	ESP	1981	Southern Europe	S European Ancestry	Catholic	21
Sri Lanka	LKA	2003	Southern Asia	SEC Asian Ancestry	East	43
Sudan	SDN	2011	Northern Africa	W Asian-N African Ancestry	Muslim	51
Sweden	SWE	1981	Northern Europe	NM European Ancestry	Protestant	21
Switzerland	CHE	1987	Western Europe	NM European Ancestry	Catholic	27
Syria	SYR		Western Asia	W Asian-N African Ancestry	Muslim	
Thailand	THA	2000	South-Eastern Asia	SEC Asian Ancestry	East	40

Table A3: Country list of event history model

Togo	TGO	2005	Western Africa	S African Ancestry	Other	45
Tunisia	TUN	2011	Northern Africa	W Asian-N African Ancestry	Muslim	51
Turkey	TUR	1990	Western Asia	W Asian-N African Ancestry	Muslim	30
United Kingdom	GBR	1960	Northern Europe	NM European Ancestry	Protestant	0
United States	USA	1960	Northern America	NM European Ancestry	Protestant	0
Uruguay	URY	1995	South America	L American Ancestry	Catholic	35
Venezuela	VEN	1995	South America	L American Ancestry	Catholic	35
Viet Nam	VNM	2001	South-Eastern Asia	SEC Asian Ancestry	East	41

Notes: blank in the year of entry indicates the country has not be surveyed by any social survey program in the census of this study. Zero in the survival time means this country was surveyed at or before the onset of the study. Region comes from United Nations global regions category.