# PhD Thesis


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## STATE DEVELOPMENT, INSTITUTIONAL FLEXIBILITY AND LONG-RUN ECONOMIC GROWTH: A CROSS-COUNTRY EMPIRICAL EXAMINATION

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**ABSTRACT**

This thesis is an empirical investigation examining the impact of state development and institutional flexibility on economic growth, across fifteen developed countries from 1880 to 2008. The development of the state, particularly since the late nineteenth century, has resulted in the exponential growth of institutional complexity and living standards. While there is evidence to suggest institutional flexibility may have increased for a time during this period, evidence also indicates a subsequently decline over the course of the twentieth century, resulting in 'rise and decline' explanations for economic growth. This 'rise and decline' hypothesis is tested in this thesis in an attempt to rehabilitate the works of Mancur Olson. This thesis presents a new framework for establishing years of peak institutional flexibility and creates new data for measuring state development and institutional flexibility. It finds both improvements in state development and institutional flexibility explain changes in cross-country growth over the long run. This should come as encouragement to those interested in institutional justifications for economic growth and all interested in revitalising Olsonion explanations for the economic performance of countries over the long run.

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# CHAPTER 1 – INTRODUCTION TO THE THESIS

## 1.1 INTRODUCTION

This research is a cross-country empirical study examining the impact of state development and institutional flexibility on economic growth, across fifteen developed countries from 1880 to 2008. Beginning with Adam Smith (1776), research into economic growth is fortunate to have been addressed by some of the most notable economists. The list of researchers includes David Ricardo, David Hume, Robert Malthus, Friedrich List, Karl Marx, Walt Rostow, Thorstein Veblen, Joseph Schumpeter, Robert Solow, Mancur Olson, Paul Romer, Kenneth Arrow, Robert Barro, Robert Lucas and Darren Acemoglu. Smith's original enquiry as to the causes of the 'wealth of nations' is not only a central question in economic growth theory but also developmental economics, economic history and evolutionary economics (Roland, 2004). Such enquiries shed light on the emergence of Spain, France, the Netherlands and Great Britain as the first states to experience modern economic growth and their subsequent decline (North & Thomas, 1973; De Long, 2000; Roland, 2004).

To borrow the phrase from Mancur Olson, the core of this research is grounded in the idea of a 'rise and decline' of states. The principal research hypothesis asserts two opposing views of institutional development. The first maintains that the transition to a modern capitalist economy depends largely on state development and the integration and modernisation of flexible institutions which support the state. These arrangements facilitate the 'rise'. The second facet of the research hypothesis focuses on the 'decline' of states. It argues modern capitalist economies suffer slowing growth rates,

due to a decline in institutional flexibility and the ossification of once fluid and adaptable institutional structures. This leads to a conundrum where, on the one hand institutional development results in faster economic growth, but on the other hand, these same institutions retard economic growth in the long run.

The rise of the developed world is strongly linked to the development of complex and impersonal institutional arrangements. It is hard to argue that the historical economic emergence of Great Britain, France, the Netherlands and Spain could have been achieved without the development of complex institutional structures, allowing each state to pursue its economic and political goals. An excellent historical account of each of these states can be found in the works of Freidrich List. List (1841) provides an insight into the conditions pertaining in selected countries during the 1800s as modern development gathered pace. List argues countries do not experience increasing levels of real GDP per capita without suitable "public institutions". This institutional view is supported by List (1841:132) when he asserts

> "However industrious, thrifty, inventive, and intelligent, individual citizens might be, they could not make up for the lack of free institutions".

The theory of Mancur Olson is central to all parts of this research. In fact, this work is as much a rehabilitation of Olson's theory of economic development as it is an empirical investigation of the institutional determinates of cross-country growth. Olson (1982) was the first to recognise both facets of the research hypothesis, what he called the 'rise and decline of nations". Others such as Hodgson (1989) Barro (1989), Knack & Keefer (1995) and Rodrik (2000) have empirically tested Olson's original hypothesis, moving the institutional line of investigation to centre stage. This research

takes a similar approach. The empirical tests presented in Chapter 6 consider whether institutional and other related conditions, specific to each country, help explain economic growth, with the focus on state development and institutional flexibility. The countries selected as part of this investigation are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Norway, Switzerland, Sweden, the Netherlands, United Kingdom and the Unites States of America.

## 1.2 RATIONALE FOR RESEARCH

The importance of the institutional line of research has been noted by many writers in the area such as Olson (1982) Choi (1983), Hodgson (1989 & 1996) Acemoglu & Robinson (2001 & 2012) North (1990 & 2005), Reinert (2007), Rodrik (2007) and North, Wallis & Weingast (2009). The rationale for this research stems from the increased use of institutional models to explain the economic performance of countries. Institutional explanations have become more prevalent primarily due to the dispersion and divergence of world incomes levels. Since the Industrial Revolution Western economies have seen output grow at a much faster rate than labour. This has caused many to question the validity of neo-classical interpretations when explaining the economic performance of individual countries, as it has become clear, factors of production alone cannot accurately explain cross-country income levels per person.

Hodgson (1996) states that neoclassical "production function" faces difficulties in explaining cross-country productivity differences with many abnormalities present in the world today. North (2005) agrees with this view and provides and explanation for these abnormalities. North argues the static nature of the neoclassical approach prevents economists from accurately explaining causes of growth across the planet, as the function analyses the volume of factors of production alone. The production function ignores human behaviour, the stock of human knowledge and institutional structures in an economy and therefore cannot accurately explain the performance of the economy. If the economy were static as assumed by the static neoclassical production function, any increase in productivity is simply attributed to increases in the rate of labour productivity. The reality is somewhat different.

Olson (1996a), an ardent supporter of institutional explanations for economic growth, claims that if institutions are important, countries with similar cultures, resources and climates should only display significantly differing levels of economic growth, if they operated under diverse institutions. Poor countries only remain poor because they "do not have a structure of incentives that…would pick up the big bills" (Olson, 1996a:6). This is certainly the case in the world today. Evidence from former East and West Germany, Mexico and the southern United States and North and South Korea illustrate how important institutions are in enabling economic growth. Additionally, when considering investigating the development of rich countries in the world today it is useful to ponder the question posed by Rokkan, Flora, Kuhnle and Urwin (1999). The writers question why it is that today, so little has been done in an attempt to develop an amalgamated understanding for the prosperity of developed countries, yet so much attention has been focused on regions with the shortest recorded histories and poorest documentary accounts of national records. For these reasons this research is deemed to be necessary.

## 1.3 RESEARCH QUESTION

Fundamentally, this research attempts to explain if state development and institutional flexibility explain the rate of GDP per capita growth from 1880 to 2008 for the fifteen selected countries. Given the limitations of traditional approaches to this question, this research only considers variables directly related to state capacity and institutional flexibility, when explaining the causes of economic growth. The fifteen countries selected for the empirical analysis all possess extended data series on many institutional variables, which are necessary to examine the impact of state development and institutional flexibility on economic growth in the long run.

State development is measured in various ways, which are elaborated upon in Chapter 5. Such measures include the capacity of the state to raise revenue from citizens living inside its territory, the volume of external trade generated by the state, the capacity of the state to provide primary education to the child population and the capability of the state to ensure the provision of mass democracy among the adult population. In conjunction with these, institutional flexibility is deemed a key determinant of economic growth. By their nature, institutions become less flexible through time, a concept Olson (1982) called *institutional sclerosis*. Sclerosis can be due to rent-seeking behaviour by individuals, narrow special-interest groups or explicit lobby groups. It is due to largely routinised behaviour which Veblen (1914), Winter (1982) and Hodgson (1989) suggest lead to sustained periods of relative economic stagnation. This results in a problem where institutions that are capable, or were once capable, of fully exploiting a country's productive power may not be well adept at changing, instead solidifying as time passes (Abramovitz, 1986). Institutional flexibility is essential because it is the flexibility of current institutions that govern the

pace at which new institutions can be established, resulting in higher levels of output per capita (Davis, 2010).

Overcoming institutional sclerosis is difficult as habits, routines and behaviour which created the state endure long after its creation. As with the measures of state capacity, institutional flexibility is captured in numerous ways. There are again discussed in more detail in Chapter 5. Such measures include the incidence of revolutions, occupations or the granting of national independence, regime durability, political competition in the state and three new methodological approaches to measure institutional flexibility based on Olson's 'rise and decline' hypothesis. All these are discussed in detail in the chapters that follow this introduction.

On a more specific level, this work seeks to extend the empirical work started by Black (1966) and Olson (1982), and subsequently extended by Choi (1983) and Hodgson (1989 & 1996). Black (1966) provides one of the first attempts to explain state development over the past 500 years, by grouping countries into different phases. This approach provides the basis for understanding the phases of state development through time. Olson (1982) offers a framework for understanding the rise and decline of countries through time and is an implicit extension of Black's original investigation. Olson (1982) explains how different states have prospered from the development of growth-promoting institutional structures, incentivising productive behaviour among citizens. This explanation then turns to the sclerotic characteristics that stable institutions develop through time, the result of destructive special-interest groups, preventing rapid economic development.

Choi (1983) and Hodgson (1989) both test Olson's hypothesis and examine the impact of institutional flexibility in promoting growth through time using the comparative model of state development presented by Black (1966). Choi's original attempt, developed by Hodgson (1989 & 1996), is the subject of much analysis in this research. This research builds on all previous work by capturing a measure of institutional flexibility and using this measure to explain changes in the rate of economic development across countries. Many of the institutional variables used in the analysis that follow in Chapter 5 and Chapter 6 take inspiration from Hodgson (1996).

## 1.4 SUMMARY OF STRUCTURE

The remainder of thesis is presented in six separate chapters each of which is now briefly discussed.

### 1.4.1 Chapter 2

The primary focus of Chapter 2 is to explain the evolution of the state from primitive, insecure foundations to the complex, robust institutional structures that form the bedrock of society today. These foundations have enabled the state to grow and develop into the modern institutional arrangements that dominate life in the developed world. It is almost impossible to argue that the enhancement of state capacity has not resulted in higher levels of GDP per capita in countries which have progressed along the path of modernisation. Chapter 2 provides an explanation of this process making specific reference to North, Wallis & Weingast (2009) and the conditions prevailing in modern states that have allowed them to capture and maintain large shares of global economic output. To complement the theoretical discussion, three conceptual frameworks of the state are presented. The first two focus on the development of the state at a basic level, and how developed countries have progressed from disorder to order, based on a set of institutional constraints. The third model is that developed by Black (1966). This model is central to previous investigations in this area and the methods and empirics presented in Chapter 5 and Chapter 6 of this thesis.

### 1.4.2 Chapter 3

Chapter 3 is largely a rehabilitation of Mancur Olson's theory of economic growth. It provides a detailed description of Olson's theory, paying particular attention to his earlier works, *The Logic of Collective Action* and *The Rise and Decline of Nations*.

The chapter explains the logic behind the rational ignorance of citizens and institutional sclerosis, the latter directly linked to institutional flexibility. Institutional flexibility is examined on a country basis with Great Britain used as the Olsonian exemplar for institutional sclerosis. An examination of cross-country growth rates in developed economic since World War II illustrates how institutional sclerosis spread across the developed world since 1945. Lastly, the chapter fuses the works of Black (1966), Olson (1982) and North, Wallis & Weingast (2009) creating a model of institutional flexibility, based on the rate of state development, with the underpinnings of Olson's 'rise and decline' hypothesis.

### 1.4.3 Chapter 4

The concept and impact of democracy is central to this work. It is used both as a measure of state development (rise) and a proxy for creating new measures of institutional flexibility (decline). Chapter 4 is devoted to, and provides a detailed analysis of, the relationship between democracy and economic growth. The direction of causation in the relationship is discussed as are quantitative measures of democracy used to test the relationship. The main focus of the chapter is to investigate the impact of democracy on economic growth. Three hypothesis are presented, each of which are discussed in turn. An analysis of results into previous democracy and economic growth investigations is presented and discussed. This extensive survey of the literature provides a thorough grounding of the impact of democracy on economic growth which becomes important when interpreting the empirical results in Chapter 6

### 1.4.4 Chapter 5

Chapter 5 presents all data used in the empirical tests. Much of this data is original and has been constructed by combining or manipulating existing data. This is one of the main contributions of this work. Six new data sets from 1880 to 2008 for fifteen OECD countries now exist when can be used by investigators that follow. This new data is presented in Section 5.4. Before this data is presented the chapter explains how all data is collected and the sources that have been used. The methods used in the empirical tests in Chapter 6 are explained in detail and the new method for calculating institutional flexibility is presented and discussed. This is another key contribution as it provides an original and robust method for establishing the high point of institutional flexibility in each country, allowing the 'rise and decline' hypothesis to be tested.

### 1.4.5 Chapter 6 & Chapter 7

Chapter 6 presents all empirical results. The three measures of institutional flexibility used in the empirical tests are discussed and a graphical presentation of the rise and decline of each country is presented using the new measures of institutional flexibility. Following this, the empirical results are presented and demonstrate the impact of state capacity and institutional flexibility on economic growth for all fifteen countries from 1880 to 2008. Each set of results is presented with a different measure of institutional flexibility. These results build directly on the work of Olson (1982), Choi (1983) and Hodgson (1989 & 1996). A discussion of the results is then provided. Chapter 7 concludes the thesis. It summarises the main contributions, findings and areas of future research.

## 1.5 CONCLUSION

This chapter provides an overview of what is to follow. As stated, this research questions the extent to which state development and institutional flexibility explain the rate of GDP per capita growth from 1880 to 2008. A cross-country empirical investigation is deemed the most appropriate way to tackle this question and provide a meaningful answer. The work seeks to extend that of Black (1966), Olson (1982) Choi (1983) and Hodgson (1989 & 1996) with the motivation for much of what follows coming from these researchers. The thesis is presented in the following structure: Chapter 2 discusses the evolution of the state; Chapter 3 is a rehabilitation of Mancur Olson's work; Chapter 4 is a detailed examination of the relationship between economic growth and democracy; Chapter 5 describes and presents all data collected and used in Chapter 6, where the empirical results are presented and discussed. Chapter 7 concludes the thesis and elaborates on the future direction of work which could extend this analysis.

# CHAPTER 2 – STATE-BUILDING & MODERNISATION

## 2.1 INTRODUCTION

Chapter 1 raises an important conundrum regarding institutional development. While robust, impersonal and flexibility institutions are needed to achieve the highest levels of GDP per capita, the same institutions can retard economic growth through time, due to institutional sclerosis which causes the ossification of once flexible institutions. Chapter 2 addresses the first part of this, providing a foundation for examining the importance of a robust institutional framework in promoting growth. The purpose of this chapter is two-fold. Firstly, this chapter will provide the reader with an overview of the emergence of the state, its evolution and an explanation for the development of the complex, impersonal set of institutional arrangements, which ensure the state's existence. Secondly, it discusses three conceptual frameworks of the state, two theoretical models of state evolution and a comparative model of state development.

The importance of institutions and institutional conditions supporting the creation of the state has been addressed by von Schmoller (1900), Veblen (1914), Weber (1965), Olson (1982), Hardin (1982), North (1990 & 2005), Hall & Jones (1999), Hodgson (2000 & 2006a), Acemoglu & Robinson (2001 & 2012) Rodrik (2007) and North, Wallis & Weingast (2009). Each has made key contributions over the past century. Chapter 2 provides this foundation. Section 2.2 provides a definition of both an institution and state. Section 2.3 describes the evolution of the state from a pre-modern to modern institutional structures. Section 2.4 examines conceptual frameworks of the state and provides a detailed description of the comparative model forwarded by Black (1966). Section 2.5 concludes the chapter.

## 2.2 INSTITUTIONS & STATES

The emergence and evolution of the state is a curious thing. Humanity survived for a long time without the existence or interference of the state. Basic state structures are in existence for about the last 10,000 years meaning the concept of the state, even at its most basic primordial level, is a relatively new phenomenon. Its existence is inherently linked to the evolution of formal and informal institutions (Smith, 2004; Farghar & Blanton, 2007; Blanton & Faghar, 2008; Hodgson, 2009). This section explores the concepts of institutions and states in an attempt to provide an understanding of both. This is necessary as both institutions and states are often confused or misinterpreted, with the latter often incorrectly labelled a nation. Furthermore, North (2005) argues any model attempting to understand the process of economic development, as this research does, must acknowledge the importance of the human environment. This environment is a construct of rules, norms and conventions, providing structure and reducing uncertainty associated with human interactions. An understanding of human behaviour is at the very essence of how and why states emerge and evolve.

### 2.2.1 What are Institutions?

Whilst an exact and acceptable definition of what comprises an 'institution' remains elusive, most writers acknowledge institutions are a set of formal and informal rules, norms and habits with the objective of providing an incentive structure which human activity relies upon (North, 2005; Hodgson, 2006a). As a starting point the distinction between rules, norms and habits is provided by Hodgson (2006a). A rule is defined as "a socially transmitted and customary normative injunction or immanently normative disposition, that in circumstances X do Y" Hodgson (2006a:3). The enforcement of

rules differs from norms and a distinction can be made between the two. A norm "involves approval or disapproval" whereas rules do not (Hodgson (2006a:5). This definition of a norm builds on the work of Tuomela (1995) and Searle (1995). A habit is "a disposition to engage in previously adopted behaviour or thoughts, triggered by an appropriate stimulus or context" and require "repeated behaviour" in order to be established (Hodgson (2006a:6). From rules, norms and habits formal and informal institutions emerge.

North (1990) and Furubotn & Richter (2005) suggest two types of institutions exist, those that are created by central authority and "protected from above" and those created by individuals and 'protected from below'. The former are generally considered formal institutions, while the latter are generally informal. Formal institutions are delineated as constraints on government or individual behaviour and are enforced by legal rules. Informal institutions are private constraints which flow directly from the spontaneously emerging norms, customs and habits (North, 2005). Much earlier, Menger (1981) discussed the same process by which institutions evolve, concluding institutions could fall into two categories; those that emerge through conscious design (protected from above/formal institutions) or those that appear through spontaneous order (protected from below/informal institutions). While institutions evolve both deliberately and impulsively, Menger (1981) and Hodgson (2000) argue that such a process does not begin at an "original state of nature" but is dependent upon rudimentary institutions (such as language) that must be assumed to inevitably exist. Hodgson (2000:144) clarifies this point stating:

> "All theories must first build from elements which are taken as given, However, the particular problem of infinite regress identified here, undermines

> any claim that the explanation of the emergence of institutions can start from some kind of institution-free ensemble of (rational) individuals in which there is supposedly no rule or institutions to be explained. Consequently, the project to explain the emergence of institutions on the basis of given individuals runs into difficulties, particularly with regards to the conceptualization of the initial circumstances from which institutions are supposed to emerge".

For the purposes of this work, institutions act as the rules of the game and exist in conjunction, and are reliant upon, the individuals that use them. The nature and structure of institutions shape the behaviour and choices that citizens make and define the existence of the state. Sound institutions encourage productive actions and discourage predatory behaviour (North, 1990; Nee & Ingram, 1998; Williamson, 2000; Furubotn & Richter, 2005; Hodgson, 2006a). Popper (1957:60) provides an appropriate metaphor, claiming that "institutions are like fortresses. They must be well-designed and properly manned". The countries that are examined later in this work have created economic, military, political and religious powers through institutions, structuring the relationships of their citizens. These institutions have concurrently allowed individuals control over resources within the state, providing incentives to engage in productive activity, reducing the instance of internal violence, a pattern known as "social order" (North, Wallis & Weingast, 2009). It is these social orders that have enabled the developed world to reach productive capacities today that are exponential larger than anything ever seen before.

Williamson (2009) argues the institutional arrangements existing today have allowed developed countries reach unprecedented levels of output but at a cost. The

formalisation of institutions has hurt economic performance as institutional sclerosis sets in. This conundrum is central to all aspects of the thesis presented here. On the one hand, many institutions promote economic development, leading to higher levels of GDP per capita. On the other, institutions begin to solidify through time, preventing change and rapid bursts of economic growth. This work examines both the growth-promoting nature of institutions, directly linked to state capacity, and the growth-retarding nature of institutions, central to the work of Mancur Olson. The remainder of Chapter 2 deals with state capacity, the evolution of the state and the role of the state in promoting economic growth. Chapter 3 examines the growth-retarding aspect of institutions and attempts to rehabilitate the works of Mancur Olson.

### 2.2.2 Defining the State

The ‘state’ refers to the highest level of legislative authority and involves a system of roles and codification of rules, with monopoly access to specified resources. It is an autonomous and centralised body, with a political dimension, and attempts to control the population within a geographic region. Seagle (1941) notes that the birth of the state is linked to the increasing layered nature of society and emergence of a class system. The shift towards this system is in no small part due to the ever increasing numbers of people living in communities. Free riding became easier and punishment of free riders harder, hence the need for and emergence of codifying laws. Max Weber, often cited as the most preeminent authority when defining the state, argues a state holds a monopoly over the legitimate use of force in the geographic region under its influence and has the power to raises revenues as it sees fit among citizens living

under its authority. For Weber, the monopoly use of legitimate force is the fundamental test of statehood.

Weber (1965:1) claims that:

> "If no social institutions existed which knew the use of violence, the concept of "state" would be eliminated...Of course, force is certainly not the normal or the only means of the state – nobody says that – but force is a means specific to the state... Specifically, at the present time, the right to use physical force is ascribed to other institutions or to individuals only to the extent to which the state permits it. The state is considered the sole source of the "right" to use violence. Hence, "politics" for us means striving to share power, either among states or among groups within a state".

It should be noted, while controlling violence is a central task of the state, no society has managed to solve this problem by the extermination of violence completely. To date, the best case scenario has been to limit and control the level of violence (North, Wallis & Weingast, 2009). The legislative order, which forms the foundation of the states, is subject to modification, when deemed necessary, by constitutional amendment. The objective of the state should be the optimisation of the public interest through the appropriate allocation and administration of citizen rights and resources. The properly functioning state is essential for the operation of a modern economic society (Weber, 1965; Tilly & Zophy 1975; Linz, 1993; Bendix, 2002; Furubotn & Richter, 2005).

Notably, a state is characterised as existing only in a simulated or artificially sense. The modern states that exist in the world today have, in many respects, reduced

internal violence, recognised individual freedoms and ensured legislation exists to protect these freedoms. Protection of private property is guaranteed allowing a properly functioning market economy to exist. Everyone lives under the jurisdictions of a state. There is no land area on the face of the planet that is not under the authority, or is claimed to be under the authority, of a state. The institutions preserving the state are a consequence of two separate explanations. The first is through conscious design, with examples including institutions such as the judiciary or national parliament. The second process of institutional formation occurs spontaneously. In this case, institutions develop through self-enforcement and may not be the consequence of design or public support. As far back as the turn of the twentieth century von Schmoller (1900:61) wrote on the evolutionary nature of institutions which shape the state, defining them as

> "A partial order for community life which serves specific purposes and which has the capacity to undergo further evolution independently. It offers a firm basis for shaping social actions over long periods of time; as for example property, slavery, serfhood, marriage, guardianship, market system, coinage system, freedom of trade."

Weber (1919:1) emphasizes his definition of the states is one of "means" and not "ends". For Weber the means is the legitimate use of force when deemed necessary and argues

> "Sociologically the state cannot be defined in terms of its ends. There is scarcely any task that some political association has not taken in hand, and there is no task that one could say has always been exclusive and peculiar to those associations which are designated as political ones: today the state, or

historically, those associations which have been the predecessors of the modern state".

Weber's contributions have led to the extension of discussions on an exact definition of the state. Jackson (1990) suggests that Weber's definition of the state as means driven – with reference in particular to the means of force – emphasises the existence of empirical or *de facto* statehood. In other words, the state has the capacity to govern. This is opposed to juridical or *de jure* statehood where the state has the legal right to govern but may not have the capacity to enforce this legal right. While Weber does not dismiss the juridical state outright, he fails to incorporate juridical characteristics into his definition of the state (Jackson & Rosberg, 1982). In this sense Weber's definition requires refinement since, in reality, the state needs not just sociological or empirical authority from its citizens to survive but jurisdiction authority grounded in legal rules. Brownlie (1983) provides a description of the juridical characteristics necessary for *de jure* statehood such as a legally recognised territory, supporting a stable population, with the enforcement of governance and the sovereign right to enter into relations with other states.

### 2.2.3 State Capacity

A definition of state capacity can be acquired from an examination of state sovereignty. Goldmann (2001) distinguishes between state sovereignty and state capacity. The reason for such a distinction is based on the premise that sovereignty can exist in "internal" and "external" forms. Internal sovereignty is the legitimate right of the state to govern its own affairs. External sovereignty pertains to the acknowledgement of other states to the legitimacy of authorities in existence in a state to govern their own affairs, without external influence. State capacity refers to the

ability of the sovereign state to dispense the authority bestowed upon it by itself, and while this is distinct from state sovereignty in some countries, any distinction between the two in developed countries is negligible (Goldman 2001; Axtmann 2004).

The history of state formation is littered with examples of prolonged efforts by authorities to turn juridical statehood into *de facto* or empirical statehood (Axtmann, 2004). Many states created after the Second World War, particularly those in Africa, display characteristics more akin to juridical statehood than empirical statehood. The sovereignty of these "quasi-states[1]" generally originates not in the capacity or their government to rule, but in a legal right granted to them by external forces, upon which these states rely on to exist (Jackson, 1990; Axtmann, 2004). Weber argues that if *de facto* statehood is to truly exist, two coexisting forces of coercion cannot survive within the same jurisdiction. "Quasi-states" often fail to meet this requirement. The inability of the "quasi-state" to establish a permanent right to the legitimate use of force over a territory, results according to Weber, not in a quasi-state but more appropriately a situation of "statelessness" (Weber, 1965; Jackson & Rosberg, 1982). If an internal or external group can successfully challenge the incumbent authority by means of force or otherwise, and create a geographic area where they possess a monopoly on the lawful use of violence, it thereby attains the qualities of statehood.

In spite of the legal structures that are put in place to cement of the power of the state, Weingast (2005) points out, that states can and do still fail. In fact, Weingast suggests that most constitutions fail, ultimately leading to the failure of the state. The laws

[1] The quasi-state exists in a juridical sense. The state has the legal right to rule but may not have the capacity. The quasi-state is endorsed by a collection of other sovereign states, each with empirical statehood.

enacted by the state require the backing and approval of the public. Such approval is often influenced by the state, through careful manipulation of public opinion, which provokes emotive and psychological reactions and can help explain why some laws are obeyed and not others (Hodgson, 2009).

## 2.3 THE EVOLUTION OF THE STATE

Understanding the evolution of the state from a primitive to highly complex order is necessary to appreciate the continued development and increasing capacity of developed countries today. The empirical tests following in Chapter 6 are grounded in the logic that the economic, political and social conditions, enabling an expansion of state capacity, resulted in higher living standards for all citizens. These tests examine the state from the late nineteenth century. Unfortunately, the availability of data before this time is, in many cases, non-existent even for developed countries. However, despite the lack of data preceding the early 1800s, an understanding of the evolution of the state is essential in order to appreciate the empirical tests. North, Wallis & Weingast (2009) provide an overview of the evolution of the state from what the authors' term the "natural state" and "open-access" state, on which this section is loosely based. However, the terms "natural" and "open-access" are replaced with what this research believes are more appropriate names, discussed later in this section. Furthermore, it is important to note that the evolution of the state had been recognised far earlier. Friedrich List was one of the first to write about individual state development. List (1885) notes by the middle of the nineteenth century the developed states in Europe had passed through five unique phases; barbarism, pastoral conditions, agricultural conditions, industrial conditions and commercial conditions. North, Wallis & Weingast (2009) analysis is a restoration of the central tenants of List's main argument.

North, Wallis & Weingast (2009) argue that the emergence of the state and the laws that it depends upon, are almost inevitable given societies shift away from primitive tribal communities into highly stratified social systems. No longer can social norms,

customs or habits be used to enforce rules. Instead more rigid, formal, structured codes of conduct are required. More than forty years earlier this process of change had been considered by Cyril Black under a different guise – that of modernisation. Black (1966) argues with the passage of time, traditional institutions evolve modern functions, reflecting the exponential increase in knowledge, acquired by human beings. Eventually a state acquires the most sophisticated political, economic, technological and social developments. The process of development is discussed more in Section 2.4.

The work of primatologist Frans de Waal can help explain some of the psychological motivations behind the evolution of the state and conformity (or lack thereof) to its laws. De Waal (1982, 2009) describes the living conditions of humans and their ancestors. For millions of years humanity has lived in social groups which have had leaders and followers. Such groups did not emerge through intelligent design, but evolved slowly. Grief & Tabellini (2011) highlight the fact groups formed because of the benefits to cooperation and reduction in enforcement costs. This resulted in a scenario where all members of the group benefited from pursuing the cooperation strategy. States today exploit the instinctive, impulsive behaviour inherent in their citizen to belong and conform to a social group. Such instinctive behaviours often ensure citizens bow to authority imposed upon them by the state, with lower layers of the social spectrum deferring to the authority of those above them. The state could not survive without this instinctive behavior since if the state is to exist, the subjugated must conform to the authority of those that govern (Weber, 1965). In fact Hodgson (2009:158) states that "the very existence and functioning of complex state machines depends on...obeisance". Milgram (1974) illustrates the innate tendency of humans to

adhere to authority despite the potential consequence of their actions. The reason for such behaviour is the "inherited, instinctive propensity for obedience", increasing the chances of acceptance into a cohesive social group and ultimately, increasing the chances of survival (Hodgson, 2009). The obedience of citizens living within a state to its laws is necessary for the state to exist and develop. Fortunately for those in authority, obeisance to the state is instinctive within humans, and needs less coercion from authority to engrain it in the minds of citizens, than one may expect. As Hayek (1973:11) wrote that "Man is as much a rule-following animal as a purpose-seeking one".

Before this section addresses the pre-modern and modern states, it is importance to note the difference between citizens conforming to authority and obeisance to authority. Weingast (2005) presents a game involving two citizens and a dictator whose primary objective is to remain in power. Weingast (2005) demonstrates the difficultly for citizens attempting to remove the dictator; coordination being one problem, while a divide-and-conquer strategy of the incumbent being another. Both strategies ensure that the dictator can remain in power. In this case citizens are conforming to the authority of the dictator. Obeisance to authority is quite different as it requires acceptance of that authority. Obeisance to the state plays a crucial role in the later stages of state development when authority and the stratification of society have become more apparent. The instinctive obedience among citizens living within a state to bow to the authority of the legislative is grounded in habit; the habit of obeisance. Hodgson (2006a) states that in order for habits to be established, repeated behaviour is necessary. Such behaviour has had ample time to be established during the 'deep time' necessary for evolution of the human race or as William James

(1892:143) puts is “habit is thus the enormous fly-wheel of society, its most precious conservative agent”. The significance of habits and routines on the evolution of institutions fundamental to the state are recognised by Veblen (1914) and Hardin (1982). Hodgson (1996) develops the work of Veblen (1919) by pointing out that institutions supporting the state have emerged from an evolutionary process and are inherently linked to habits, routines and stability passed on through generations.

### 2.3.1. The Autocratic State

Western Europe today is a complex and well-defined geographic region. The economic systems, which are almost universal across Western Europe and the developed world, are grounded in the ideas of capitalism. These systems began to emerge in Europe during the merchant era with the production, buying, selling and trading of domestically produced goods and services (Galbraith, 2004). In conjunction with this, fair taxation by the state emerged and facilitated an expansion of state capacity. List (1841) identifies that a state could reach its highest level of prosperity by simply taxing fairly and ensuring both justice and peace reign. Excluding major conflicts in Western Europe over the past number of centuries, which saw the temporary division of some states, the countries prevailing in Europe today emerged centuries ago. However, the roots of European state-building can be traced back much further than the emergence of capitalism or the borders of European states today. State-building initially emerged due to Roman and Germanic tribes, and a collection of tribal leaders, kings, princes, nobility, religious orders, merchants, guilds, even agrarian landowners (Strayer, 1963; Bendix 2002; Axtmann, 2004; North Wallis & Weingast, 2009).

A vast array of emigration, conflict and occupation that has characterised European state development over the past two millennia from the Roman Conquests, Celtic expansion, Germanic tribe invasions during the 4th and 5th centuries, Arab conquest of Iberia, Viking raids of Normandy and the British Isles, to the westward drift of the Slavs and eastward drift of the Germans during the 12th century. The continued changes to European states, both in the form of occupation, diffusion of ideas or incursion into foreign territory, has shaped the states that are present in modern Europe, and has resulted in the formation of a complex, multifaceted and cultural diverse continent (Rokkan, Flora, Kuhnle & Urwin 1999). The state-building of early Europe resulted in differing sets of political, economic and social outcomes for each country. Whilst outcomes differed, the practical logic behind state-building was largely consistent across all countries. As a starting point Strayer (1963:19) provides a useful summation for this logic:

> "The process of building a state…took a long time, especially as it was done almost entirely with internal resources. The process seems to have been started by purely practical considerations. The mass of the population suffered from petty wars and general insecurity: it wanted more and better government, especially better administration of justice."

This definition offers an insight into the early considerations behind the development of states, with practical consideration the foundation of such decisions. Weber (1954) North & Thomas (1973) and Bendix (2002) argue early European states were generally characterised by regal legislators holding absolute power. This set of institutional structures is what North Wallis & Weingast (2009) call the "natural state". For the purposes of this work the idiom 'natural state' is replaced with the

more appropriate term ‘autocratic state’. The reason for this change is due to the fact that there is very little ‘natural’ about the state. As mention at the start of Section 2.2, humanity survived for millennia within the existence of the state, their emergence a relatively new occurrence. In this sense, the state is far from ‘natural’. A far better terminology is the autocratic state. This description is compatible with Olson 1993 paper *Dictatorship Development and Democracy*. Olson provides an excellent overview of the transition of that state and assumes the presence of a dictator. Such an assumption supports the “autocratic state” description.

Autocratic states exist in three forms; fragile, basic and mature with the essence of all three grounded in personal relationships. Regardless of the level of development in a natural state, authorities have two functions. Firstly, rulers have absolute power over their subject but also a responsibility to provide protection to these subjects. Weber (1954) suggests this is the very essence of a feudal state as it, forms a “sacred bond” between ruler and subject. Secondly, as the power granted to a king or other ruling monarch is granted by God, authority is likewise granted from the same divine source. Any attempt to interfere with this could result in the damnation of the soul for eternity.

#### 2.3.1.1 *Fragile Autocratic State*

The fragile autocratic state is scarcely capable of withstanding internal or external violence. A dominant coalition holds power whose commitments can change swiftly and are influenced by personal relationships and individual identity. North Wallis & Weingast (2009) suggest that citizens in the fragile autocratic state risk death when making political mistakes while wielding power in the dominant coalition is crucial

for individual prosperity. An absence of credible commitments mechanisms, to keep check on the ruling elite, ensures institutional structures are primitive. This fosters an environment of instability, the underdevelopment of public goods and absence of property rights.

#### *2.3.1.2 Basic Autocratic State*

The "basic" autocratic state emerges from a slow movement away from the fragile autocratic state. It is a consequence of increased ability to provide robust institutional structures within the organisational framework of the state. Such structures include succession arrangements following the death of a leader, taxation policy and judicial procedures to solve individual conflicts. Each of these arrangements reduces the threat of internal violence. While the control of internal violence is the key difference between the fragile and basic autocratic states, the latter does possess the same characteristics for organisational development. Identical to the fragile autocratic state, the basic autocratic state does not allow organisations outside of direct control of the dominant coalition to exist. Basic autocratic states are not adept at sustaining private arrangements, outside of the control of the state, as institutional structures cannot permit private activity to occur. Such activity could undermine the governance structure of the dominant coalition. Public institutions, developed by the state, do become more complex but the strength of these is based on the ability of those wielding power to make credible commitments about the future. All organisations are instead, integrated into the fabric of the dominant coalition (North, Wallis & Weingast, 2009).

*2.3.1.3 Mature Autocratic State*

The final phase of the autocratic state is the "mature" phase. The mature autocratic state possesses both robust institutional arrangements and the ability to maintain both public and private organisations. The key difference from the basic autocratic state is the ability to sustain organisations outside the direct institutional scaffold of the state. In essence, the mature autocratic state facilitates both public and private organisations, through the development of both public and private legal arrangements. The robust institutional structures of the mature autocratic state are often capable of survival even if the dominant coalition is removed. This is a unique characteristic, as institutional arrangements in both the fragile and basic autocratic states collapse in the face of a shift in power. This stability and the incentives associated with it can lead to rapid economic growth (North, Wallis & Weingast, 2009). The mature autocratic state is further characterised by the development of 'negative' sovereignty, where formal legal institutions exists which sustain the state and ensure it is answerable to it citizens alone (Jackson 1990; Atxmann, 2004). 'Positive' sovereignty follows on from this once the state begins to provide public goods for all citizens.

As states move from fragile to basic conditions relationships become more impersonal and organisations become more clearly defined and institutionalised. Movement to the mature autocratic state means the development of credible institutions that can survive or out-life the dominant coalition as well as the formation of private and public organisations outside the direct control of the state. The progression through the stages of the autocratic state is by no means inevitable. North, Wallis & Weingast (2009:73) point out that

> "The dynamics of natural states are the dynamics of the dominant coalition, frequently renegotiating and shifting in response to changing conditions. If adjustments lead to more power and rents based on personal identity, institutions become simpler and organizations less sophisticated, and the society moves towards the fragile end of the progression of natural states. If adjustments lead to more power based on durable agreements, institutions become more complex and organisations become more sophisticated, and societies move toward the mature end of the progression. No compelling logic moves states in either direction".

Furthermore, it is important to note movement from fragile autocratic state to mature autocratic state and beyond cannot be thought of as a simple transition from a primitive, unstable institutional structure to a more robust set of arrangements. The process instead must be considered as an on-going phenomenon with an infinite time horizon. Black (1966) argues that it is a continuing set of changes, occurring simultaneously, which change static and intransigent autocratic institutions, allowing for the capacity to perform more complex and impersonal duties and exchanges. However, in spite of the different dynamics possessed by the fragile, basic and mature autocratic states, one common thread running through all three, ensuring a perpetual 'autocratic' level of advancement; the ruler is above the legal system. In fact, in many autocratic states not only is the ruler above the law but so too are the institutions and organisations of the dominant coalition. This issue has plagued every country for thousands of years and has only been overcome recently by a handful of states. Those that have overcome this problem have created a dual system of governance; a personal identity and a social identity (North, Wallis & Weingast, 2009). The latter (the office)

has been able to constrain the former (the office holder). This development has moved the state to a new order which this research now considers.

### 2.3.2 The Democratic State

Just twenty-five countries in the world today can be considered to be what North, Wallis & Weingast (2009) term "open-access orders". The remaining one hundred and seventy-five states are stuck in perpetual degrees of the autocratic state. Again, as with the term "natural state", this research replaces, North, Wallis & Weingast (2009) "open-access order" idiom with the term 'democratic state'. Various other names could have been used such as the inclusive state, impersonal state or modern state. The democratic state is chosen as mass enfranchisement is consistent across all countries at this stage of development. While this may not be so at the commencement of the 'democratic state' the prevailing conditions act as the catalyst allowing this to happen. Furthermore, the impact of democracy on economic growth and institutional flexibility are central themes throughout this thesis and therefore the use of the term 'democratic state' is deemed appropriate.

To understand why so few states have made the jump from autocratic to democratic state, one must consider when the transition to the democratic state became possible. While different dates have been suggested for this transformation, this research identifies the Treaties of Westphalia in 1648 as the starting point for the possible emergence of the democratic state. However, while the Treaties provided the opportunity for democratic state to emerge, the first of these did not appear until the early nineteenth century (North, Wallis & Weingast, 2009).

Following the Treaties, the theory of 'state sovereignty' was enshrined internationally among states and ensured the legislative authority in a state alone held authority over its people and resources. No external force had the right to exert its authority over that of the sovereign state. In effect, the state was accountable to no authority but itself. While negative sovereignty existed since the mature autocratic state, positive sovereignty takes root once the state reaches the democratic phase (Jackson 1990; Atxmann, 2004). Not only does the democratic state possess institutions, which maintain negative sovereignty of the autocratic state, it now has positive sovereignty and the capacity and resources to bestow political goods upon its citizens such as peace, security from internal and external forces, freedom and equality to all citizens, justice, democratic rights, thus preserving the state itself. Positive sovereignty is an indicator of a transformation of the goals of authority, away from absolute rule, towards the incentivising citizens to achieve their productive capabilities (Jackson, 1990; Axtmann, 2004). Additionally, the Treaties Westphalia guaranteed governments would not seek to reward some groups in society and alienate others, such as minority ethnic or religious factions, undermining their citizenship. More importantly, The Treaties altered the power structure in European states away from small groups or dominant coalitions of the autocratic state, in favour of the centralised institutions of the state (Anderson, 1996; Axtmann, 1996 & 2004). This section now considers the three key characteristics of the democratic state.

*2.3.2.1 Shared Belief System & Universal Inclusion*

Central to the democratic state is a shared belief system and inclusion of all citizens. All citizens are considered equal under the law and have the right to form organisations, lobby groups, make private contracts and agreements, access the

judiciary when necessary and avail of public goods provided by the state (North, Wallis & Weingast, 2009). While the autocratic state is characterised by stable local groups, a relatively simple and stable occupational differentiation and a predominately subsistent society, the democratic state is industrialised, market-orientated with machine technology, rational, secular, possess a high degree of social mobility, well-developed occupational systems and an egalitarian class system. Sustained increases in incomes per person follow, exceeding anything that could be achieved under the autocratic state (Black, 1966; Inkeles, 1966; Huntington, 1971; Wrigley, 1972; Tipps, 1973; Dixon, 1999).

The inclusive nature of democratic state evolved further during the nineteenth century, recognising the rights of citizens to be part of democratic process. While inclusiveness took nearly a century or more in some cases to roll out fully, the processes commenced when enfranchisement became widespread during the late nineteenth and early twentieth century. This process, discussed at greater length in Chapter 4, has resulted in a growth of inclusion, equality of opportunity and the replacement of 'merit' over 'birth'. Bendix (2002) argues modern states can only truly exist when the link between the sovereign authority and privileges bestowed upon citizens through hereditary rights is broken. At no point in the history of humanity have power, status and income been distributed in a more equitable way. This situation has arisen due to the creation of political and social awareness amongst the majority of the population and a rejection of longstanding beliefs of hereditary entitlements (Black, 1966; Huntington, 1971; Lee, 1973). This transformation has been made possible by the exponential increase in the knowledge of mankind over the past two and a half centuries. The increase in human knowledge has allowed for

greater control over the environment, with the changes occurring in Western Europe during the mid-1800s, acting as the catalyst for the transformation these states (Black, 1966; Desia, 1971). This transformation is comparable in size to the decision of nomadic peoples to settle and engage in agriculture some 10,000 years earlier (Bendix, 2002).

*2.3.2.2 Spread of Citizen Rights, Extension of Franchise & Clerical Decline*

The second key characteristic of the democratic state revolves around the relationship centralised authorities have with citizens and the codification of citizen rights living under the jurisdictional authority of the state. A core element of the transformation of European states after the French Revolution was the codification of rights between each individual citizens and the state (Torpey, 2000; Bendix, 2002; Axtmann, 2004). The emergence of democratic European states, made possible by the Treaties of Westphalia, was galvanised by the radical social and political upheaval of twin revolutions in Western Europe during this period; the Industrial Revolution beginning in the United Kingdom and the French Revolution. De Tocqueville (1955) calls this period of European state-building 'The Great Transformation' and the beginning of the start of an age of equality, which ultimately lead to the establishment of rights for every citizen (Bendix, 2002). The development of the democratic state rests upon successfully delivering these rights to citizens, in the process differentiating citizens from non-citizens, in an attempt to protect those that need to be protected and to develop a capacity to "embrace" each citizen so the state can extract resources from them.

Events in France in 1789 advanced the rights of citizens on two fronts, by increasing those considered fit for "functional representation" and by advancing the "plebiscitarian principle". Functional representation exists when a public assembly consists of only those deemed "proper" to hold such office. In medieval Europe such assemblies would have consisted of elders, grand masters of guilds and wealthy land owners. The plebiscitarian principle refers to a direct vote to all those qualified to vote under the electoral system present in a country. According to this principle, any such authority which is deemed to interfere in the relationship between the state and individual citizens must be destroyed so that each individual citizen can enjoy the rights and privileges granted to all under that citizenship.

Marshall (1964) claims as the democratic state evolved, the rights of citizenship developed along three separate dimensions. Each citizen was entitled to equality of 'civil rights' such as freedom of speech, the right to a fair trial, the right to worship. Each was entitled to 'political rights' such as the right to vote or stand for election (the many changes in voting rights across European countries are presented in Appendix 3.1). Finally, each had 'social rights' bestowed upon them such as the right to personal security or the right to live as a civilised citizen. Each of these three dimensions were enacted through four separate public institutions; the courts (protecting civil rights); regional and state representative bodies facilitating political interaction (political rights); social services to ensure a basic level of protection for all citizens from hunger and starvation; and the provision of schools to provide basic education to the young (social rights). As societies became wider, the qualifications necessary to be regarded eligible to vote were reduced resulting in a far broader electorate (Bendix, 2002).

The spread of the rights of citizenship, allowing the election of a popular government, is a defining moment in the evolution of the state, as the ruling elite become answerable to the law of the state and can be removed through legal procedures. The spread of political competition in the democratic system ensures losers in the electoral process are not punished (North, Wallis & Weingast, 2009). This assumption is grounded in the idea that citizens have the capacity to govern themselves and intelligently partake in the democratic process, with no one person in society deemed "better qualified" than others to wield the power of authority (Dahl, 2000; Axtmann, 2004). The transformation of the state from an individual with absolute power to a collective society, based on citizen rights and democratic freedoms, further enhances the notion of sovereignty. No internal or external force is deemed to have the authority to undermine the transformed, democratic state.

It emerged quite quickly it was easier to pioneer political and legal rights among citizens that social and economic rights. Due to this, the combination of political and legal equality and economic and social inequalities prevailing in Western Europe during the early 1800s stimulated much of the great state-building debate. It was only after these basic civil, political and social rights were extended to the lower classes of society that a country could be considered to be experiencing that latter phases of state-building. The right of all citizens to a basic level of education and the right to participate in elections are identified by Bendix (2002) as two key indicators of equality emerging in society. Once these rights are established among the lower classes, a state can be deemed to have reached a milestone in its development. The latter was greatly assisted by an enactment in French law in August 1792 extending

the rights of enfranchisement to all French males older than 21 years.[2] Such an act, which extended the voting rights of the general population, is the first such by a European state to formally extend the plebiscitarian principle and was duly followed by others. The former, access to elementary education, has become a right of citizenship. Dual forces are responsible for the upholding of this right. On the one hand, government enforcement of a basic level of education ensures each citizen fulfils this obligation. On the other, parental responsibility, enacted in law, ensures all children receive primary education. The extension of compulsory elementary education and voting rights not only acted as building blocks in state-building but extended the power of central authorities over the Church, causing a State-Church divide, particularly on the delivery of education. The Church viewed these efforts of modernising countries as a systematic attempt to undermine its authority, as it created a direct link between each citizen and the state, which the Church could not exert its influence over. Such a move, while controversial, is identified by Strayer (1963) as marking the end of the Middle Ages and the beginning of the modern state. Basic loyalties are transferred from the Church to the secular state, a change which, more than anything else, characteristics the emergence of a democratic state.

*2.3.2.3. Incentive Systems Preventing Rent-Seeking & Impersonal Exchange*

The third characteristic of the democratic state is the creation of incentive systems that minimise rent-seeking activity and result in impersonal exchange, the latter reinforcing the former. A fundamental problem with fragile and basic autocratic states is the widespread existence of personal exchange. Citizens are often treated differently based on who they are. The democratic state has evolved to a level of

[2] Excluded from this right were all "servants, paupers and vagabonds", however the Constitution of 1793 did extend the right to vote to paupers who had lived in a particular region or district for greater than six months (Bendix, 2002).

complexity that ensures citizens are treated the same regardless of background, belief or kin. Impersonal exchange permits governments to allocate resources and provide public goods on an impersonal basis, without reference to political beliefs or other characteristic. This impersonality extends to the rule of law and guarantees all citizens are not only bound by the rule of law, but that the law will be administered in an impartial and just manner. The widespread existence of impersonal exchange safeguards the system as individuals find it far more difficult to manipulate interests. Rights bestowed on all citizens limit the power of government, reducing the opportunity for rent-seeking behaviour and advancement through politically engineered channels (North, Wallis & Weingast, 2009). The emergence of stable democracies resulted in the establishment of self-enforcing limits on ruling coalitions, with elites having an incentive to respect rules (Przeworski, 1991; Weingast, 1997, 2005; North, Wallis & Weingast, 2009).

This evolution of incentive structures led to the birth of the 'modern' state, which began to display the most sophisticated political, economic, technological and social developments. It is facilitated by common law and common institutions, creating a greater sense of identity, governmental procedures, legal rights and cultural norms (Strayer, 1963). This process of development broke many hereditary rights. It is interesting to note that as the democratic state became more developed in Europe during the 1800s, an inconsistency emerged between the extensions political and legal rights on the one hand and economic and social rights on the other. As mention, Bendix (2002) believes it took considerable time for the latter to emerge in post 18$^{th}$ century Europe. Roland (2004) offers a useful insight into what he terms "fast-moving" and "slow-moving" institutions. This insight may be able to explain the

historical conflict experienced during later stages of state-building, where legal and political rights were at odds with economic and social rights. Roland considers political and legal institutions to be generally "fast-moving". For example, political institutions could change overnight following the election of a particular party or due to an event such as a revolution or *coup d'etat*. In this sense, changes can be fast-moving. In contrast, economic and social rights or norms are generally slow-moving. For example, a social norm like societies' attitude towards trade union membership or blood sports tend to change more slowly. Roland (2004) suggests that such intransigence is possibly due to the connection between social norms and religious beliefs which shape the values of many people in society. These religious beliefs have been unchanged for millennia in some cases and consequently cause social norms to change very slowly.[3]

### 2.3.3 The Process of Modernisation in Democratic States

The evolution of the state, from a set of 'autocratic' institutions to a democracy, has allowed a small set of countries to advance along the path of modernisation (North, Wallis & Weingast, 2009). While it has to be stated the Treaties of Westphalia in 1648 acted as the catalyst for this, the democratic state and subsequent modernisation did not begin apace until the mid-1800s. The two major European conflicts of the twentieth century continued the process, having just as dramatic impact on the shape and design of European countries. By the end of the Second World War almost every Western Europe country was considered to be 'modern' as citizens began to think in terms of the interest of the state, rather than provincial interests (Black, 1966).

[3] It is important to note that this is not necessarily always the case with social norms. For example the introduction of legislation with prevents the smoking of cigarettes in public houses and restaurants in some countries caused an immediate and dramatic shift in society's attitude and tolerance of cigarettes and their use. Quickly new norms emerged as smokers were forced to engage in this activity in designated areas or outdoors.

Modernisation is therefore the path democratic states have embarked upon since shedding the characteristics of early autocratic states.

The relevant literature on modernisation itself is extensive, scattered and beset by profound confusion regarding an exact definition of what is modern, what is not, and what 'modernisation' exactly refers to. The concept of modernisation first came to widespread prominence during the 1950s and 1960s due to increased interest in the idea, particularly among American economists, after the development of global economies post World War II. Many attempts have been made to define exactly what economists and other social scientists mean when they use the term modernisation. As yet, no consensus has been agreed upon. However, it is undeniable, regardless of how one defines the concept, developed states have experienced rapid modernisation over the past 250 years, transforming from autocratic rule to modern democratic states (North, Wallis & Weingast, 2009). The encompassing nature of the term modernisation, which incorporates political, economic, technological and social changes across society, has resulted in the process being described as an umbrella concept as it performs an aggregating function, combining many sub-concepts under one idea. This conveys a very complex picture as it is both a 'process' and a 'product' and is often cited as a primary obstacle in resting upon a definition which is universally acceptable to all. Instead it is argued that the popularity of modernisation as a concept is rather due to its capacity to summarise the development of democratic states. The process has undoubtedly had a transformational, progressive and multifaceted impact on developed countries, changing almost every institution.

While the outcome of the process tends to have a revolutionary impact on a state, the passage of time required for such an impact is described as evolutionary (Huntington, 1971; Desia, 1971; Tipps, 1973). In the same way the mature autocratic state was impacted by events in Europe such as the Treaties of Westphalia, the French Revolution and Industrial Revolutions, Persson (2010) offers three plausible explanations for the explosion in living standards in democratic states and the beginnings of modernisation during the nineteenth century. Persson (2010) argues that advent of science-based knowledge, the flow of innovations and new products and the increasingly efficient processes and technologies that emerged during the 1800s, all resulted in increased investment in capital and labour, resulting in large increasing in the productive capacity of both factors of production. By the late 1800s the "open-access order" described by North, Wallis & Weingast (2009) was well established in Western Europe. The continued improvement of the democratic state prompts Dixon (1999) to suggest that the process had transformed the predominately subsistent, agrarian natural states into urban, industrialised, market-orientated or 'modern' economies. Sustained increases in income per person followed, exceeding anything that could be achieved under traditional institutions. Interestingly, Lee (1973) claims this process of modernisation was a consequence of "the growth of equality of opportunity" in Western Europe during the 1800s, following the Reform Acts in the United Kingdom.

The early democratic orders of the 1800s were unique in that an unparalleled number of innovations and ideas appeared which continue to dominate life today. Such breakthroughs include mechanised production, new ways to apply scientific knowledge to healthcare, electricity, the combustion engine and motor car, new

farming methods, household appliances, information technology, wireless communication devices and the telephone. Such change occurred with the introduction of steam power and later the arrival of electrical power to drive machinery or the development of new, faster methods to produce industrial goods. (Smelser, 1963; Persson, 2010). This transition occurred across the full spectrum of society. Smelser (1963) argues that these changes consist of "structural differentiation", as with each case of technological or industrial change, pre-existing structures were substituted with greater specialisation.

As with the autocratic state moving between fragile, basic and mature order, the modernisation of the democratic state is not necessarily inevitable (Lerner, Pevsner & Riesman, 1958; Tipps, 1971). The drift towards a scientific understanding of things was very much a European 'innovation' (Persson, 2010). By the end of the nineteenth century Europe possessed the institutional arrangements necessary for the transfer of knowledge and technology to the mass of the population. Abramovitz (1986) calls these arrangements 'social capabilities'. By the turn of the twentieth century these social capabilities included the delivery of a minimum level of education to the entire population and a financial system supporting enterprise and innovation. Nineteenth century modernisation did come at a cost. Dixon (1999) suggests the bureaucratic institutions, a feature of modern states, wield a much tighter fiscal control over citizens and often seek to consolidate and increase this hold. A discussion of this is provided in Chapter 3, while many aspects state development and the increase in bureaucracy are tested in Chapter 6 to establish the impact of both on the rate of economic growth.

## 2.4 CONCEPTUAL FRAMEWORKS OF STATE DEVELOPMENT

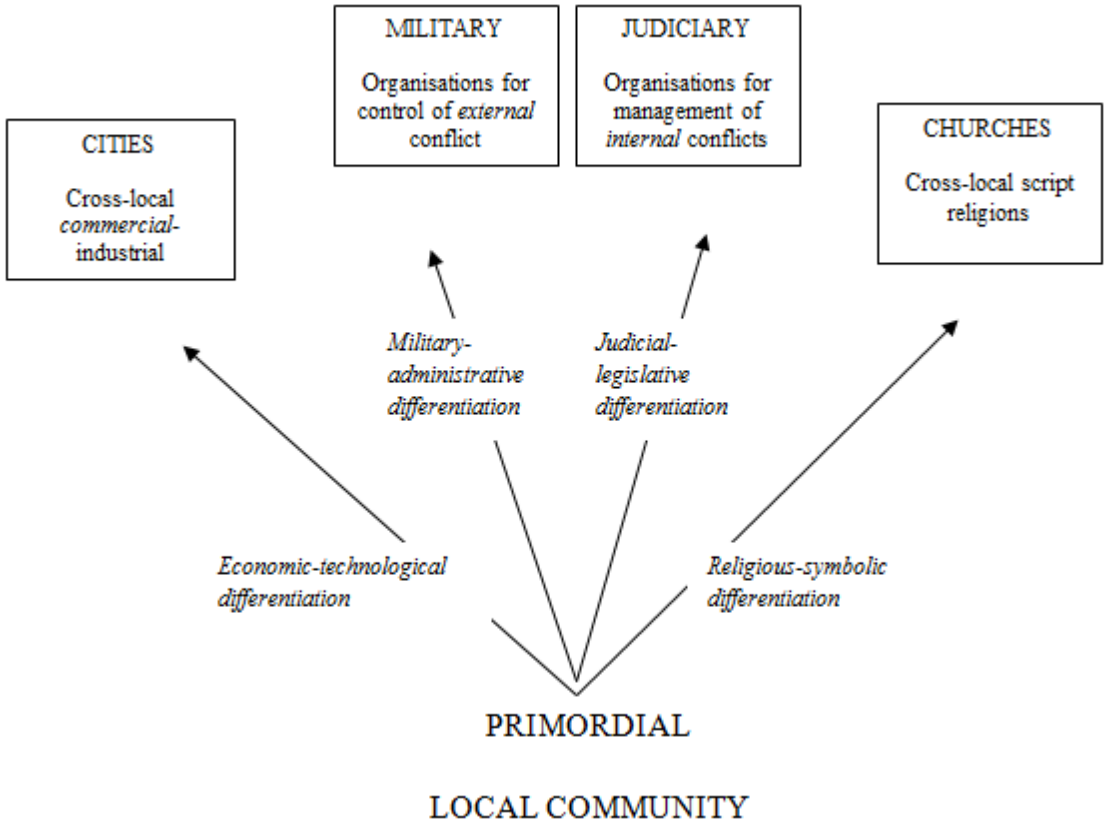
The discussion in the chapter has been centred on the evolution of the state from fragile autocratic institutional arrangements through to the modern, democratic states existing today. For the benefit of the reader and the empirical tests that following in Chapter 6, it is necessary to discuss three comparative model of the state. The first two models provide a conceptual theoretical framework for the development of the autocratic state from fragile to basic to mature phase. The last model, developed by Black (1966), provides a cross-country empirical framework of state development, from the fragile autocratic state to, in some cases, a modern democratic state. Black's model is currently the best tool mapping out the phases of state development from fragile autocratic state to democratic order. The model has been used by Choi (1983), Hodgson (1996) and Dixon (1999) in an attempt to explain the rate of GDP per capita growth. The empirical tests following in Chapter 6 not only use this framework, but build on previous investigations using Black' model.

### 2.4.1 Theoretical Framework of the Autocratic State

When considering the fragile and basic autocratic states, Parsons (1971) provides a useful paradigm and offers four unique processes, which primitive civilisations embarked upon during the early stages of state building. This model is presented in Figure 2.4.1. The emphasis in the model is on the earlier stages of development and a shift away from local, intransigent organisation of economic and political systems towards the basic autocratic state. The first of the four steps is the creation of institutions for dispute resolution such as a basic courts system. This is followed by a growth in military power which exerts control over adjacent populations, food supply and other resources. A disconnection with mythical believes and the consequent rise

of organised religion follows next. Lastly, the emergence of technically skilled craftsman, traders and merchants leading to the emergence of cities is the final step in Parson's model. The concept of the city is a fundamental dimension in the history of state-building as they act as a source of power from which structure and control can emanate from.

**Figure 2.4.1 Parson's Paradigm of the Basic Autocratic State**



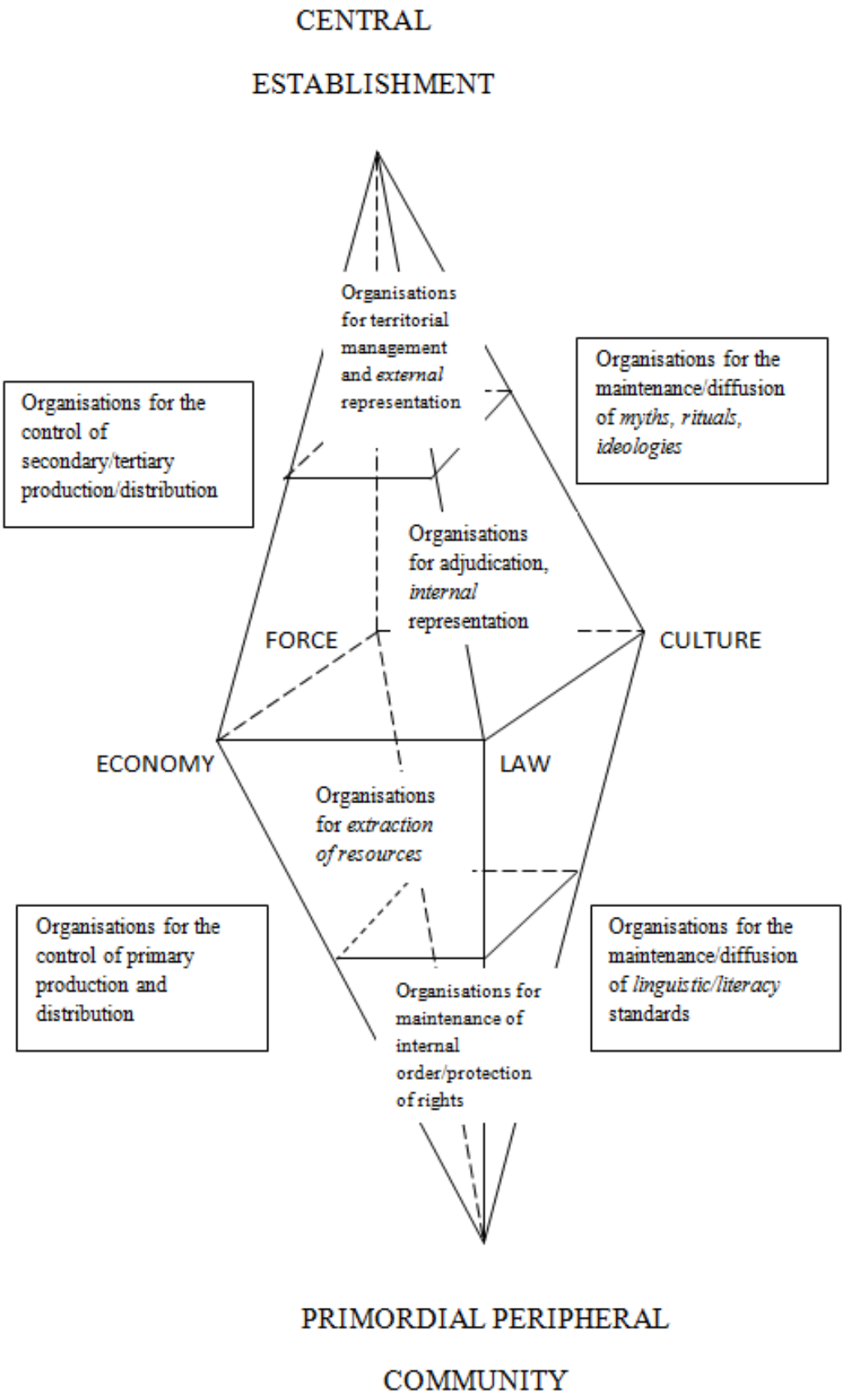

*Source*: Parsons (1971)

An excellent model conceptualising the process of state-building, moving from the basic autocratic state to the mature autocratic state, has been developed by Rokkan, Flora, Kuhnle & Urwin (1999) and builds on Parson's (1971) earlier conceptual model. Rokkan, Flora, Kuhnle & Urwin (1999) go further than the parsimonious model presented by Parsons (1971) and attempt to offer a model which captures the complex nature of state-formation and state-building in Europe. The model is

illustrated in Figure 2.4.2 and is developed around three groups of "focal variables", the most important of the three "total system variables". Total system variables represent components and phases of change in the whole system within the territorial area of ruling elites (Rokkan, Flora, Kuhnle & Urwin, 1999). The total system variables focus primarily on the interaction of four components identified by Rokkan, Flora, Kuhnle & Urwin (1999) as the cornerstones of the state. These are listed as "force", "culture", "law", and "economy". Force refers to some form of protection of national borders through aggressive action if necessary. Culture refers to the universal acceptance of widespread beliefs. Law in the model indicates some basic standard by which disputes are controlled. Economy refers to the fact that each variable in the system is dependent for its survival on other agencies in the system. The model allows one to consider the integrated nature of the "total system variables" inherent in state-building and the interaction of these four with more peripheral aspects of the state such as organisations for the control of resources or maintenance of internal order.

The four corner elements of force, culture, law and economy presented in Figure 2.4.2 provide the foundations for understanding the evolution of the state from the basic to mature autocratic phase. The mature state manages to establish law and order for all citizen, even if the ruling elite is outside this law, provides the basis for cultural beliefs to flourish, maintains a functioning and impersonal economic system and establishes full control of a specific geographic region. Each corner provides additional structures supporting the mature state, such as organisations for territorial management (force), internal order and diffusions of literacy standards (law), extraction of resources (economy) and the maintenance of ideologies (culture).

**Figure 2.4.2 Conceptual Model of the Mature Autocratic State**




*Source*: Rokkan, Flora, Kuhnle & Urwin (1999)

Six periods[4] are defined in the model each of which is regarded as playing a role in state-building in Europe. Rokkan, Flora, Kuhnle & Urwin (1999) suggest it is impossible to understand the intricate design and variation in the make-up of European states without travelling far back in the continent's history, examining the initial early difference and initial territorial acquisitions. The early periods of this model are well defined by specific dates, with the later stages less clear. However, three events during the seventeenth and eighteenth centuries are regarded as having an exponentially large impact on the organisation of society and the rights of individuals. The first are the Treaties of Westphalia, the second the Industrial Revolution originating in England around 1760 and the third the political revolution in France from 1789 – 1794. These events are regarded as watershed moments in the history of European state-building (De Tocqueville, 1945; Bendix, 1980; Axtmann, 2004). A prominent characteristic of medieval Europe is the inherent nature of the mass of the population to work the land and exclusion from political participation. The Treaties of Westphalia, the French Revolution and the Industrial revolution saw the beginning of the end of this (Bendix, 2002).

Rokkan, Flora, Kuhnle & Urwin (1999) develop their conceptual framework of the mature autocratic state by combining elements of Hirschman's (1970) work with that of their own. [5] A paradox is posed regarding the early state-building of Western

[4] The six periods are as follows: Early Middle Ages; High Middle Ages; 1500 – 1700; 1648 – 1789 (overlap of "territory" variable only here); Intensified State Building; and Urbanisation, Industrialisation, Secularisation.

[5] Rokkan, Flora, Kuhnle & Urwin (1999) work has been influenced by Hirschman's (1970). In his paper *Exit, Voice and Loyalty*, Hirschman (1970) analyses the connections between decision-making in politics and the economy. Developed around three core elements of "loyalty" "voice" and "exit", Hirschman identifies that at all levels of human life structures and procedures are present which capture these three. Examples of the three are offered by Rokkan, Flora, Kuhnle & Urwin (1999). If one considers the genetic code in cells and the immune defences in organisms, the basic structures which keep these systems intact should be considered to be "loyalty" mechanisms. The communication of the nervous system with all parts of the body ensuring information flows through this functioning system is

Europe. The continent developed "strong centres of territorial control at the edges of an old empire" hence paradoxically, the countries originally pioneered state-building were those that were not under the influence or control of the Roman Empire. England was clearly a state in the fifteenth century, at a time when French princes (such as the Duke of Burgundy) could still hope to split provinces from France and combine them with his holdings in the Low Countries (Strayer, 1963).

However a number of key points have be raised as to the success of mainland European state building which followed the successful peripheral regions. Rokkan, Flora, Kuhnle & Urwin (1999) note the advanced cultural, technological and organisation capacity of mainland Europe even during the early Middle ages. The well-developed and technologically advanced agrarian economy present in early Europe facilitated the mature autocratic state as a large population could be fed and maintained through this advanced agriculture system (White, 1940; van Bath 1963). The fundamental rights and norms existing under Roman law, which permeated various territories, facilitated a coherent flow of information and trade, helping to advance the mature autocratic state (Smith & Wilhelm, 1928; David & Brierley, 1978). The presence of cultural diverse and autonomous cities, facilitated the mature autocratic state, as each acted as centres from where institutional structure and procedures emerged.

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captured in the Hirschman model by the "voice" mechanism. These mechanisms allow for internal and external information to be supplied by component parts about conditions affecting the system. Finally, inherent in any system from basic DNA forms to complex state building, sources of change are identified. Mutations in DNA or the invasion of countries precipitate change. Hirschman captures this change using an "exit" mechanism; that is the transfer of a part of the system from one to another.

### 2.4.2 Black's (1966) Model of Comparative State Development

Black (1966) provides a comparative model of state development from a starting point of 1649 up to 1965, for approximately 150 countries. Black's model examines four stages of development, and is an attempt to identify the progression of countries through the stages of state development, from autocracy to democracy. The model identifies seven patterns of development, the first commencing in the United Kingdom in 1649 and France in 1798 and the last in Africa post World War II. Black (1966) suggests the comparison of states facing similar sets of conditions at a given moment in time is far more appropriate than comparing states phases of development. The phases of development are broken into four categories. The four used by Black (1966) are the Challenge of Modernity (CoM), Consolidation of Modern Leadership (CML), Economic and Social Transformation (EST) and Integration of Society (IoS). Table 2.4.1 presents an abridged version of suggested years for the commencement and end of each phase of state development for the fifteen countries, considered in the empirical tests in Chapter 6. It is important to note that Table 2.4.1 includes only three of the four phases. Black (1966) argues that the initial stage of modernisation, Challenge of Modernity, is more generally defined in terms of its starting point than the remaining three phases, and therefore it is not possible to establish a year of commencement. The United Kingdom was the first state to consolidate modern leadership, coinciding with the commencement of Cromwell's reign in 1649, and along with France, are the only states in Black's first pattern of development.

Column Two in Table 2.4.1 presents the patterns development identified by Black (1966). These 'patterns' are groups of countries, which Black assumes modernise together. For example, France and the United Kingdom are assumed to be in Pattern 1

and were the first two countries to enter Black's CML phase. New World offshoots are group together in Pattern 2 and are thought of as the second group of countries to entry the CML phases. The bulk of countries in Table 2.4.1 enter CML in Pattern 3 (between 1795 and 1848). Japan starts to consolidate modern leadership as late as 1866 (Pattern 5).

**Table 2.4.1: Phases of State Development**

| Country | Pattern | Consolidation of Modern Leadership | Economic and Social Transformation | Integration of Society |
|---|---|---|---|---|
| Australia | 2nd | 1801 - 1901 | 1901 - 1941 | 1941 - |
| Austria | 3rd | 1848 - 1918 | 1918 - | |
| Belgium | 3rd | 1795 - 1848 | 1848 - 1948 | 1948 - |
| Canada | 2nd | 1791 - 1867 | 1867 - 1947 | 1947 - |
| Denmark | 3rd | 1807 - 1866 | 1866 - 1945 | 1945 - |
| France | 1st | 1798 - 1848 | 1848 - 1945 | 1945 - |
| Germany | 3rd | 1803 - 1871 | 1871 - 1933 | 1933 - |
| Italy | 3rd | 1805 - 1971 | 1871 - | |
| Japan | 5th | 1868 - 1945 | 1945 - | |
| Netherlands | 3rd | 1795 - 1848 | 1848 - 1948 | 1948 - |
| Norway | 3rd | 1809 - 1905 | 1905 - 1945 | 1945 - |
| Sweden | 3rd | 1809 - 1905 | 1905 - 1945 | 1945 - |
| Switzerland | 3rd | 1798 - 1848 | 1848 - 1932 | 1932 - |
| United Kingdom | 1st | 1649 - 1832 | 1832 - 1945 | 1945 - |
| United States | 2nd | 1776 - 1865 | 1865 - 1933 | 1933 - |

*Source*: Black (1966)

Table 2.4.2 is an attempt to explain why Black (1966) chose the selected dates in Table 2.4.1 as a means of explaining entry into the various phases of modernisation. Following on from Table 2.4.2 each of Black's phases are discussed and examined in conjunction with the phases of state development forwarded by North, Wallis & Weingast (2009).

**Table 2.4.2: Major Events Table for Commencement of Phases**

| Country | Consolidation of Modern Leadership (CML) | Economic and Social Transformation (EST) | Integration of Society (IOS) |
|---|---|---|---|
| Australia | *Unknown* | Australia becomes a federation | US permitted on territory after Fall of Singapore |
| Austria | Hungary proclaims independence from Austria | Austria is declared a republic | |
| Belgium | Belgium becomes a part of France | Uprisings in Provinces of Liège and Hainaut | Benelux customs union established |
| Canada | Canada divided into lower and upper parts | Dominion of Canada united | Canada declared of equal status with UK |
| Denmark | Surrender to British after siege of Copenhagen | Defeat in the Second Schleswig War And revision of the Danish constitution | End of World War II |
| France | French Revolution | Founding of Second Republic | End of World War II |
| Germany | Territorial reform of German States | German Unification | Adolf Hitler becomes Chancellor |
| Italy | Napoleon declares himself the Emperor of Italy | Rome replaces Florence as capital city | |
| Japan | Meiji Restoration | End of World War II | |
| Netherlands | Velvet Revolution | Revision of the constitution and establishment of parliamentary democracy | Benelux Customs Union established |
| Norway | End of Dano-Swedish War | Norway becomes independent kingdom | End of World War II |
| Sweden | Removal of monarchy's absolute power | Union of Norway and Sweden dissolved | End of World War II |
| Switzerland | Republic of Switzerland formed | Swiss constitution is enacted | Hosting of Olympic Games |
| United Kingdom | Cromwell's reign begins | Reform Act | End of World War II |
| United States | Declaration of Independence | Civil War Ends | New Deal Begins |

*Source*: Timelines (2012)

*2.4.2.1 The Challenge of Modernity – Fragile to Basic Autocratic State*

The Challenge of Modernity forces pre-modern states to adopt and develop more robust institutions. It is a consequence of increased ability to provide robust institutional structures within the organisational framework of the state and demonstrates the movement from fragile autocratic state to a basic autocratic state. Such structures include clear succession arrangements, defined taxation policy and a judiciary with the authority and power to deal with legal conflicts. Internal violence is reduced as robust institutional structures reduced the incentive to act in a coercive manner. When faced with this first phase, the ruling coalition more often than not accept some of the reorganisation required by society and reject others suggestions (Black, 1966; North, Wallis & Weingast, 2009).

*2.4.2.2 Consolidation of Modern Leadership – Basic to Mature Autocratic State*

Consolidation of Modern Leadership begins with a transfer of power away from the traditional, hereditary base established by the ruling coalition to the emerging, educated middle classes. Communities move from a predominantly agrarian way of life towards a politically organised society, with stable institutions. The state extends its control over the population and has a direct relationship with every citizen. This relationship starts when centralised taxation exists and government expenditure extends to satisfy the needs of the state such as the establishment of an education system (Black, 1966). The robust institutional structures that develop after the consolidation of modern leadership, ensures the state is capable of survival even if the dominant coalition is removed. This characteristic equates the consolidation of modern leadership to the commencement of the mature autocratic state. The stability that consolidation of modern leadership brings leads to rapid economic growth, the expansion of the state and formal legal institutions exists which are self-reinforcing and

ensures the state alone is answerable to it citizens (Jackson 1990; Atxmann, 2004; North, Wallis & Weingast, 2009).

*2.4.2.3 Economic and Social Transformation – Mature Autocratic State to Democratic State*

Economic and Social Transformation is deemed to exist when societies are largely urban in nature and the majority of the population is focused on the national agenda. The need for organisation at political levels of society is essential for achieving an economic and social transformation as institutions forming the basis for an democratic state emerge (Black, 1966). Economic and Social Transformation (EST) is akin to the commencement of the democratic order as both North, Wallis & Weingast (2009) and Black (1966) stress the importance of the mass of society playing a political role. Black (1966) suggests that at the start of this phase only a small fraction of the population exercise political power but a broadening of the political base soon follows, where larger sections of the population become enfranchised. All citizens are considered equal under the law and have the right to form organisations, lobby groups, make private contracts and agreements, access the judiciary when necessary and avail of public goods provided by the state (North, Wallis & Weingast , 2009). EST recognises the rights of citizens to be part of democratic process. This development precipitates the democratic state, delivering rights to all citizens such as a basic level of education, the right to participate in elections, a set of incentive minimising economic rent-seeking, permit impersonal exchange and providing public goods to where they are most needed.

*2.4.2.4 Integration of Society – Modernisation of Democratic State*

The integration of society is the final phase in Black's model and occurs when a state moves from regional and occupational groupings to relative isolation. It is important to note that this phase is similar to the modernisation of the democratic state. The process has undoubtedly

had a transformational, progressive and multifaceted impact on developed countries. However, Black (1966) argues the integration of societies does come at a cost as states become institutionalised over time, a consequence of the division of power among citizens leading to increased bureaucratisation. The slowing growth rates experienced by earlier integrating states is an example of however these countries have experienced the ossification and institutionalisation of the once flexible democratic states. This concept fits with the model of institutional sclerosis as described by Olson (1982) and is discussed in detail in the next chapter.

### 2.4.3 Deficiencies in Black's Model of Comparative State Development

Black's model, while lacking rigor, is still important as it provides the best attempt to date at distinguishing when countries passed through the phases of state development. That said there are two key defects, which the reader needs to be made aware of. The first drawback of Black's model of comparative state development is the arbitrary selection of years delineating phases of development. Table 2.4.2 attempts to lists events coinciding with Black's starting years of CML, EST and IOS. While some Black (1966) years are obvious events, causing states to move through the phases of development, others are far more arbitrary. With the exception of CML in Australia, which Black assumes commenced in 1801, it is possible to identify key events in each country that shaped economic, social and political into the future. For example, in the United Kingdom the commencement of Cromwell's regain (1649), the Reform Act (1832) and the End of World War (1945) are assumed by Black to correspond with the start of CML, EST and IOS respectively. However, these dates could have easily been the Glorious Revolution (CML – 1688), defeat of the French at Battle of Trafalgar (EST – 1805) and the granting of female suffrage (IOS – 1928). This is true for many of the countries in the sample and it can be argued some of the suggested years selected by Black

are superseded by other events in specific countries, which had more important and far-reaching economic, political and social consequences. Furthermore, the selection of some years appears to be very arbitrary. Examples include Denmark's commencement of the consolidate modern leadership in 1807 upon entering the Napoleonic Wars, Italy's economic and social transformation in 1871 following the replacement of Florence with Rome as the capital city and the enactment of the New Deal in the United State of America in 1936 marking the integration of society. Black (1966) does not clearly explain why these events are selected over others.

The second problem with the Black model is a lack of consistency when dealing with certain events. For example, a declaration of independence in the United States of America marks the starting point of Black's second phase, the Consolidation of Model Leadership. Yet Norwegian independence is the starting point for the third phase, Economic and Social Transformation. Black does not explain why one declaration of independence is deemed to move a country to consolidate its leadership base and the other to the starting point of economic and social transformation. Other inconsistencies include the selection of the end of World War II as the starting point for Integration of Society in some countries directly involved in the war and not others. For example, Denmark, France, Norway, Sweden and the United Kingdom all enter Integration of Society in 1945 yet Belgium, Canada and the Netherlands do not enter this phase until 1947 or 1948. Black (1966) provides no explanation for this delay. Additionally, explanation is required as to why Austria, Italy and Japan were still deemed not to have reached the final phase (Integration of Society) as late as 1965. While these defects limit the power of the model, they provide an opportunity to improve upon Black's contribution. The empirical tests presented in Chapter 6 do this by not only testing the suitability of Black's chosen years, but also providing years for the peak of EST.

## 2.5 CONCLUSION

This chapter seeks to clarify and a number of key theoretical concepts and act has a foundation for the chapters to follow. Firstly, it seeks to provide a clear definition of an institution, for the purposes of this research, and the state. The next objective is to provide the reader with a clear picture of the nature and pattern of the evolution of the state, from a primordial gathering of individuals, to a fragile construct of loose rules based on physical force onto the more robust states that follow, finally ending with the modern democratic state. It should be clear from this section that this process is by no means inevitable, with very few states making the jump from autocratic order to an impersonal, democratic and integrated society.

This chapter seeks to provide clarity on conceptual frameworks used to model the state and the model developed by Black (1966) which is the cornerstone of much of the work presented in Chapter 6. Two natural state conceptual frameworks developed by Parsons (1971) and Rokkan, Flora, Kuhnle & Urwin (1999) are presented. Both provide a graphical illustration of the different stage of the autocratic state. The final model considered is the comparative model of state development produced by Black (1966). While useful, this model is in need of revision. The years Black (1966) selects, as the commencement date for phases of state development, are inconsistent and in some cases not obvious. The empirical tests in Chapter 6 attempt to build on the model started by Black (1966) by providing a more rigorous approach to the years of Economic and Social Transformation. Finally, the chapter briefly mentions the damaging effect that stability can have on the capacity of institutions to perform the tasks they were established to do. This concept, known as institutional sclerosis and developed by Mancur Olson is now addressed in Chapter 3.

# CHAPTER 3 – A REHABILITION OF MANCUR OLSON

## 3.1 INTRODUCTION

The objective of Chapter 3 is to demonstrate the importance of institutions in determining the rate of economic growth using the theoretical framework of Mancur Olson. It has been shown, convincingly by Olson (1982), much earlier by Veblen (1899) and later by Hodgson (1996), Rodrik (2007) and Acemoglu (2012) that institutions matter. The potency of institutions depends not just on their design, but upon many other factors, including the stability of a state and the passage of time. Furthermore, institutions of the past influence institutional change and lead states along marked institutional courses (Grief, 2006). These set courses ensure social networks and organisations inherited from the past form the basis for institutions of the future (Grief, 1989; Granovetter, 2002) as institutions 'pass on' the important elements that they possess to future generations (Veblen, 1919; Hodgson, 2006a).

The passage of time and evolution of institutions, allowing routines and habits to form, is central to the works or Mancur Olson. The central argument or Olson's 'big idea' suggests the passage of time and stability, while allowing institutions to evolve, ultimately proves to hinder economic growth as institutional sclerosis ossifies once flexible institutional arrangements. Historical evidence abound supports the view that institutional flexibility promotes economic development (Milgrom, North & Weingast, 1991; Grief, Milgrom & Weingast, 1994; Davis, 2010). This chapter will investigate institutional flexibility using Olson's 'big idea' as the focal point. This is deemed an important contribution to the literature as there has been very little enquiry into the causes and effects of institutional flexibility on economic growth (Davis, 2010) The chapter is presented as follows: Section 3.2 outlines Olson's main idea, the original starting point for all his later works and presents

some alternative views of his hypotheis. Section 3.3 presents a new conceptual framework for considering institutional flexibility using the theoretical foundations of Olsonian theory, the "open-access order" described by North, Wallis & Weingast (2009) and the model of state development presented by Black (1966) discussed in Chapter 2. Section 3.4 concludes the chapter.

## 3.2 THE IDEAS OF MANCUR OLSON

A number of summary accounts exist tracing the life and works of Mancur Olson. Among these are Alt (1999), Dixit (1999), McLean (2000) and Oates, Oppenheimer and Schelling (2000). While the four differ on certain aspects of Olson's contributions to institutional performance and economic growth, all agree his research was centred on his 'big idea'; the logic of collective action. These summaries suggest Olson's work can be broken into three separate phases. The first phase commences with the publication of his seminal work, *The Logic of Collective Action* in 1965. The start of the second phase coincides with the application of this logic to the economic development of countries and the publication of probably Olson's most famous and cited work, *The Rise and Decline of Nations* in 1982. The last truncated phase of work concerns institutions and economic growth. This phase started in the late 1980s with the publication of "How Ideas Affect Societies: Is Britain the Wave of the Future" in 1989 and ended with *Power & Prosperity*, posthumously published in 2000, following Olson's death in 1998 (Considine & Butler, 2010). This chapter is concerned with providing an overview of the first two phases of Olson's work; the logic of collective action and Olson's application of this logic to the economic performance of countries. All three phases are discussed by Considine & Butler (2010).

### 3.2.1 The Logic of Collective Action

In the *Logic of Collective Action* (hereafter LCA), Olson (1965) suggests collective actions by member of a group, which would be to the advantage of a group as a whole, will often not occur because individuals in the group remain inactive and seek to free ride on the work of others. Using the economic tenets of methodological individualism and rational behaviour, Olson demonstrates this idea and explains individuals, acting rationally, could produce an irrational outcome for the group as a whole, similar to Hardin's (1968) Tragedy of the

Commons dilemma. While this outcome might seem counterintuitive, Olson explains the rationale for it suggesting that in large groups, information and free rider problems prevent collusion, leading to a situation where individuals do not pursue actions in the best interests of the group as a whole, instead deciding to remain rationally ignorant (Olson, 1982). Rational ignorance is encountered when the cost of educating oneself about an issue sufficiently to make an informed decision outweighs any potential benefit one could reasonably expect to gain from that decision. This discussed in detail in Section 3.2.3. Because it is not possible to exclude representative individuals from the benefits of the collective good, the logical course of action for the rational individual is to do nothing and instead free ride on the efforts of other.

In the *LCA* Olson explains under certain conditions rational ignorance can be overcome as groups form which seek to act collectively. Olson (1965) claims professional associations, farm organisations and trade union movements are similar for their members as public goods are for citizens living in a state; once something is provided for members or citizens everyone benefits from its provision. An increase in salary won by a trade union is granted to all workers under that union, not just those that negotiated the increase. Groups such as professional associations, farm organisations and trade unions form for this reason; what Olson (1965) calls selective incentives. Olson (1982:21) describes a selective incentive as:

> "One which applies selectively to the individuals depending on whether they do or do not contribute to the provision of the collective good…it can be either positive or negative; it can, for example, be a loss or punishment imposed only on those who do *not* help provide the collective good".

Positive selective incentives encourage collective action among individuals as rewards can be obtained if these selective incentives are exploited. In the case of the farm organisation it may

mean a price floor for dairy produce; for the professional association it could be a cap on the number of new entrants into a profession over a given period of time, ensuring competitive pressures in the industry are minimised. Of course, the same professional association engages in collective action under the pretence that their behaviour is in the public interest. Olson (1982:35) states that the professional association has been assisted in organising

> "By the distinctive susceptibility of the public to the assertion that a professional organisation, with the backing of government, ought to be able to determine who is "qualified" to practice the profession and thereby to control a decisive selective incentive".

Group size is an important dynamic in the logic of collective action. When the group is very large in size each individual in the group will benefit only slightly from the share of any benefits extracted from collective action. However, in smaller groups, the benefits of successful collective action are greater as each individual in the group manages to get a larger slice of the pie. Furthermore, because free riding often prevents collective action from occurring, in smaller groups those seeking to piggy-back on the work of others can be identified and punished more readily. This mechanism ensures greater cooperation among groups members and reinforces the collective action of the group. Therefore, successful groups need to be small enough so that strategic interaction between individuals can sustain the group, or alternatively, a group needs selective incentives that increase the benefit to members, while possibly excluding non-members. As Olson & Zeckhauser (1966) suggest, this paradoxically results in the exploitation of the many by the few.

*3.2.1.1 Second-order Implications*

Olson's theory would suggest numerous general implications for the establishment of special-interest groups. Firstly, it is almost impossible for the most dispersed interests to coordinate and commence collective action. Examples include taxpayers or consumers. The sheer number of interests involved, the absence of a defined leader and an inability to know where and when to organise ensures such large groups, which would undoubtedly benefit from collective action, fail to do so. Secondly, the organisation of individuals into groups, seeking to engage in collective action, does not happen immediately. On the contrary, historical evidence confirms that it takes quite some time for common interests to come together and form groups. The first labour union in the UK did not appear until 1851, almost an entire century after the start of the Industrial Revolution (Olson, 1983). Once these groups do appear, those that incurred the cost of organisation will seek to ensure the group's survival. The special-interest group will not simply waste or fade away (Weber, 1965; Olson, 1983; Considine & Butler, 2010). The consequences of these implications are relatively straightforward; over the long run, stable, democratic societies will accumulate groups for collective action. As time passes, more special-interests will emerge. While some groups will never be able to form, due to sheer size and dispersion, the groups that do form will persist through time and not fade away.

Second-order implications, regarding the logic of collective action, affect the rate of economic growth. Because setting up and maintaining a special interest bears a cost on members, it follows that members of the same group will seek to redistribute income towards themselves through collective action, to compensate themselves for the costs associated with being a member of the group. For this reason, collective action decreases economic efficiency. Olson (1983) provides ample examples of this behaviour, such as the introduction

of tariffs on imported goods by industrial lobbyists or tax loopholes which encourage investment into activities displaying a low marginal social benefit. Additionally, narrow special-interest groups often block and prevent innovation, stifling growth in the economy. Two sources, separated by nearly one hundred years, confirm this view. Veblen (1915:17) argues along the following lines:

> "It follows also that these standing conventions out of the past unavoidably act to retard, deflect or defeat adaptation to new exigencies that arise in the further course…and so acts in some degree to lower the net efficiency of the industrial system which it pervades".

McCloskey (2010:20 – 21) provides an insightful example of collective action, stifling innovation and growth, in action:

> "A railroad was proposed in the early 1840s from Paris to Madrid. The city of Bordeaux, at a third of the distance, demanded that the railroad break there, on the argument that the break would "create jobs" for porters and hotels and cabs…according to "job-creating" logic *every* town along the route should see its opportunity and take it…Every few kilometres, at every country village, the railroad on the way to Madrid would end at a Gare du Nord to be resumed at a Gare du Sud…Jobs would be "created".

A further activity of the special-interest group is to limit entry into a market or profession. Such barriers lead to distortions in the market, making the economy less efficient. Additionally, barriers to entry reduce the rate of economic growth in the economy (Olson, 1983) which Hicks (1983) rigorously proved reduce the rate of economic growth. Productivity increases in any industry raises income levels. Resource allocations which ensure economic efficiency are prevented or delayed by barriers to entry, resulting in lower

levels of economic growth. This logic only holds when the special-interest is small. Enhanced economic efficiency, or an increase in the rate of growth, can occur if the group is encompassing enough so that a considerable proportion of the population is represented e.g. Sweden (Olson, 1990). However, as has been discussed, the chances of a super-encompassing group forming are considerably less than small groups.

Again, the size of the group becomes important in Olson's understanding of the logic. It holds that individual group members in a small group, which successfully engages in collective action, receive a larger share of the gains of their action than members of a larger encompassing group, who receive a smaller percentage gain. However, the greater the size of the larger group the greater the dispersion of social and economic costs resulting from inefficient policy decision-making. It follows that as the size of the large group grows, the smaller the social cost becomes to each individual from collective action (Olson 1983; 1989; 1990). In stable, democratic societies, the government assumes the role of the super-encompassing interest group as it represents all citizens of the state. Logically, the government then has an incentive to engage in economic activities that are the most efficient for society. This would be true if the government was not influenced by lobbies and narrow special-interest groups. The success of collective action by the latter is determined by the relative strength of the government when facing up to less encompassing special-interest groups (Olson 1982 & 1983). The rate of economic growth can be improved if the government becomes stronger (greater majority) or by making the narrow special interest groups weaker.

While super-encompassing groups do reduce the cost to each individual of inefficient decision-making from collective action, larger groups do not result in faster economic

growth. Olson (1983) claims because a group is large does not mean the action it seeks to pursue is growth enhancing. Furthermore, very large groups, which make up the vast proportion of a population, can lead to dictatorships and totalitarian rule, with minorities oppressed. Whether or not this style of government is growth-promoting or growth-retarding is discussed in Chapter 4 when the impact of democracy on the rate of economic growth is considered. Nonetheless, it is probable rather than certain, encompassing groups which make up a larger proportion of the population will attempt to engage in more socially beneficial collective than smaller, narrower groups, which have little incentive to engage in collective action that results in socially desirable outcomes. The analysis in *LCA* did not mean that the free rider issue was necessarily a problem for society. Olson was simply interested in explaining the logic. He wanted to know what explained collective action. As Oates, Oppenheimer & Schelling (2000:799) suggest:

> "Olson was not pro-union or anti-union, just interested in why unions had a hard time organising"

*3.2.1.2 Third-order Implications*

To recap, Olson (1965) explanation for the logic of collective action implies that through time individuals living in stable, democratic societies gather collectively into groups which, more probably than not, will be small in size. These small special-interest groups engage in collective action because the benefits from succeeding are confined to the group and the cost dispersed throughout society, of which the group makes up only a tiny fraction. Narrow special-interest groups do not fade away through time, but on the contrary, become more entrenched resulting in slower growth rates and lower levels of income as innovation and change are stifled or prevented entirely. While large groups, in some cases groups that are super-encompassing, are more likely to engage in collective action which is more socially

efficient, they may still slow down the rate of economic growth by pursuing inefficient objectives. Following this logic Olson (1983:25) argues:

> "Countries whose special-interest groups have been emasculated or abolished by totalitarian government and foreign occupation should grow relatively quick *after* a free and stable legal order is established. This helps to explain the marked underestimation of the growth that the war-torn economies would achieve after World War II, especially in the case of Germany and Japan".

The third-order implication assumes democratic states, immune from revolution or invasion, will be inundated with special-interest groups and will consequently suffer slower growth rates. Olson (1982) called this *institutional sclerosis*. This implication helps explain the economic performance of France and the United Kingdom, two victorious countries, in the wake of World War II. This issue is investigated in detail in Section 3.2.2. Before the effect of collective action on the growth rate of countries is considered, one must explain another third-order implication. While differences in worker productivity have in the past been incorrectly attributed to one set of people being innately efficient or industrious and another group naturally lazy, real differences in productivity come down to incentives. Varying incentives result in differences in the efficiency of one workforce over another. These incentives are heavily influenced by the extent to which small special-interest groups are able to protect their members from what Olson (1983) describes as the "Darwinian process" of the economy. It was no surprise to Olson that absenteeism in Britain during the second half of the twentieth century was higher than it had ever been and coincided with Britain's below average rate of growth. It was at this stage Olson became concerned with the consequences of collective action. His next major contribution is testament to this.

### 3.2.2 The Rise & Decline of Nations

*The Rise and Decline of Nations* (hereafter RADON) is the application of Olson's logic of collective action to a set of developed countries. It is the most widely cited of Olson's works, with over 1800 citations listed in the Social Science Citation Index (Heckelman, 2007). A crucial difference between LCA and RADON is that in LCA Olson was concerned with the implications of group size in terms of actual numbers, whereas in RADON his attention turned to the size of the group relative to society as a whole. For Olson the size of the group relative to society as a whole determined the manner in which that group would behave. The reciprocal rule applies here[6]. A decision-making group encompassing all of society will select the optimal amount of public goods and tax accordingly. There will be no rent-seeking redistribution. By contrast, a decision-making group comprising 1% of society will only invest in public goods that generate a 100-fold increase in society's product and will impose distribution taxes that maximise their tax take. While there are clearly incentives for groups of rent-seekers to form in their efforts to redistribute income, rent-seeking group activity must be subject to the same logic Olson applies to all groups in LCA. Its members also have the incentive to free-ride. Olson (1982) argues the passage of time in stable societies allows rent-seeking groups to form, and once formed they are likely to seek the continuance of the status-quo and oppose innovations that might undermine their privileged position. Many countries are used to illustrate this logic. The most frequently used by Olson and others to illustrate this is now considered – Great Britain.

#### *3.2.2.1 Great Britain and the Disease of Institutional Sclerosis.*

The name of Olson's 1982 book T*he Rise and Decline of Nations* gives an indication as to how he believes the economic performance of each country maps out through time. Olson

[6] This reasoning is implicit in Olson (1982). An explicit form of this reasoning is presented in Olson (1993).

attributed the ‘rise’ to the benefits associated with collective action of the many or encompassing interests, for example the transition from dictatorship to democracy. The decline subsequently set in as the encompassing group broke into smaller pieces and other smaller groups assembled through time (Considine & Butler, 2010). Great Britain is used as the predominant exemplar of modern economic growth. North, Wallis & Weingast (2009) argue Great Britain is the first country to become an ‘open-access order’, while Black (1966) suggests Britain is the first to pass through all four stages of state development; with Economic and Social Transformation (EST) suggested to have commenced in 1832 following the first Reform Act and ending in 1945. Following this logic Great Britain becomes the cornerstone for explaining Olson’s theory.

As the birthplace of parliamentary democracy and the location of the Industrial Revolution, Great Britain is the first example of a state experiencing modern economic growth (Considine & Butler, 2010). This enabled Great Britain to become the first state to exhibit control on a global scale with countries such as the South Africa, India, Australia and New Zealand all falling under the influence of British rule. In the absence of foreign invasion or political upheaval, Britain accumulated a growing number of small special-interest groups, which remained active due to the prolonged stability of the state since 1688. Following Olson’s logic, discussed in Section 3.2.1, the absence of disruption in Great Britain resulted in a ‘rise’ and ‘decline’. Olson (1982:78) states that the

> “Explanations of Britain’s relatively slow postwar growth, unlike many other explanations, is consistent with the fact that for nearly a century, from just after the middle of the eighteenth century until nearly the middle of the nineteenth, Britain was evidently the country with the *fastest* rate of economic growth. Indeed, during their Industrial Revolution the British invented modern economic growth. This means that

> no explanation of Britain's relatively slow growth in recent times that revolves around some supposedly inherent or permanent feature of British character or society can possibly be correct, because it is contradicted by Britain's long period with the fastest economic growth. Any valid explanation of Britain's relatively slow growth now must also take into account the *gradual* emergence of the "British disease".

This quotation asserts the 'rise' of Britain following the onset of the Industrial Revolution and the subsequent decline due to the ossification of institutions, compelling Olson to coin the term institutional sclerosis. Institutional sclerosis or "British disease" led to the economic 'decline' of a state. For Olson (1982:77) it is best explained by the fact that

> "Countries that have democratic freedom of organisation without upheaval or invasion the longest will suffer the most from growth-repressing organisations and combinations. This helps explain why Great Britain, the major nation with the longest immunity from dictatorship, invasion, and revolution, has had in this century a lower rate of growth than other large, developed democracies".

A number of interesting points can be extracted from these Olson's quotations. Firstly, countries that overcome despotic rule, in the case of Great Britain when the absolute rule of the King was finally removed following the Glorious Revolution in 1688, the period of stability that follows promotes economic growth. Secondly, the slowdown in growth following long periods of stability cannot be attributed to innate characteristics of the population because the very same people successfully harnessed the resources of the state in an earlier period. Olson (1989) dedicates a section to explaining this point and vehemently refutes the suggestion growth rates declined due to the fact that "the British are inclined to take it inherently easy" Olson (1989:27). Thirdly, it is of note, while Olson believes

democracy is growth-promoting to begin with, states that have "democratic freedom" over the long-term tend to suffer as institutional sclerosis sets in, ossifying once flexible and efficient institutional structures.

Olson is not the only person to recognise this disease. Hodgson (1996) demonstrates that many others were aware of the sclerotic nature of British institutions before the RADON was published. Anderson (1964) suggests that Great Britain was "a sclerosed, archaic society, trapped by the burden of past success". Hodsbawn (1969), Dore (1973) and Phelps-Brown (1977) all suggest that Britain's relatively poor economic performance during the twentieth century was due to the successful and prevailing institutions from the past, which had become long outdated and surpassed by more flexible institutional arrangements in the other countries. After the RADON was published Elbaum and Lazonick (1986) argued that the relative decline of Great Britain during the twentieth century was due to a lack of institutional flexibility as the prevailing institutional arrangements were developed during the nineteenth century. These rigidities, they argue, prevented all attempts to regenerate once flexibility institutions.

The conclusion from this examination of Great Britain is that economic growth appears to have followed an inverted U-shaped curve, or as Olson would suggest, a rise followed by decline. The rise corresponds to major internal conflict and the removal of narrow special-interest groups, allowing the rate of economic growth to accelerate. The decline is directly linked to stability, the passage of time and the incidence of democracy which permits groups to form. The impact of democracy on economic growth is discussed in more detail in Chapter 4 while the empirical tests in Chapter 6 include three measures of institutional flexibility as independent variables. A theoretical explanation of the measure of institutional flexibility is

discussed in Sections 3.4 and 5.2.10 while the variable is modelled in Section 5.5.2 and empirically tested in Chapter 6.

*3.2.2.2 Eurosclerosis - The Disease Spreads*

While Great Britain is the first country to experience Olson's 'rise and decline' and is subsequently labelled as having "British disease", this infection is not inherently British. Britain just happened to suffer first due to its enduring stability. Murrell (1983) finds 51% of organizations existing in the United Kingdom in 1971 were more than thirty years old. This compares to just 37% in France, 24% in West Germany and 19% in Japan, all three of whom had experienced the occupation or external removal of governments during World War II. Additionally, Great Britain had a much larger number of organisations than France, Germany or Japan. Between 1947 and 1972 Japan experienced an average annual percentage growth rate of 8.2%, Germany an average annual rate of 5.7%, France 4% and the United Kingdom just 2.4% per annum (Maddison, 1982). The only plausible explanation for Olson (1982:87) is

> "Of two societies that were in other respects equal, the one with the longer history of stability, security, and freedom of association would have more institutions that limit entry and innovation, that these institutions would encourage more social interaction and homogeneity among their member, and that what is said and done by these institutions would have at least some influence on what people in that society find customary and fitting".

Of the four countries listed, Great Britain experienced the longest period of stability and security, resulting in the onset of institutional sclerosis earlier than the other three. Britain was paying the penalty for its relative early development, a point identified by Thorstein

Veblen in 1915, long before Olson's RADON. Veblen (1915) suggests Great Britain was in a period of decline during the early twentieth century not because the British people were adverse to economic prosperity but because it was first country to experience modern economic growth. Veblen (1915:53) argues Great Britain's slowing rate of growth

> "Does not mean that the British have sinned against the canons of technology. It is only that they are paying the penalty for having been thrown into the lead and so having shown the way. At the same time it is not to be imagined that this lead has brought nothing but pains and penalties. The shortcomings of this British industrial situation are visible chiefly by contrast with what the British might be doing if it were not for the restraining dead hand of their past achievement, and by further contrast, latterly, with what the newcome German people are doing by use of the English technological lore".

Veblen's summation of the British should have acted as a warning for those coming next e.g. Germany, France and Italy. Support for the 'rise and decline' hypothesis is provided by the same countries that were eclipsing Britain's economic performance during the early post World War II era. As expected, the large differences in average annual growth between the defeated and war-torn countries and the victorious allied states began to evaporate once stability emerged. Maddison (2006) shows between 1972 and 1995, Japan grew at an average annual rate of 2.6%, West Germany at 2% and France 1.6%. Over the same period the United Kingdom grew by 1.8%. From 1995 to 2004 Japan experienced an average annual growth rate of just 1.8%, Germany 1.2%, France 1.7% and the United Kingdom and impressive 2.5%. The sclerotic effects of the passage of time and stability has caused the once rising states, defeated or destroyed after World War II, to suffer relative economic decline and stagnation. By the commencement of the twenty-first century France, Germany and Japan

were reporting slower rates of economic growth than the United Kingdom. Table 3.2.1 presents post-war data for seven major economies directly involved in World War II. Strikingly, the defeated axis countries experience the fastest growth rates directly after the war, and the allied victors the slowest. As predicted under Olsonian logic, these differences disappear over time, as institutional sclerosis sets in among the faster growing states.

**Table 3.2.1: Average Annual Percentage Change in Output 1948 to 2004**

| Country | 1947 - 1972 | 1972 - 1995 | 1995 - 2004 |
|---|---|---|---|
| Canada | 2.9 | 1.8 | 2.4 |
| France | 4.3 | 1.6 | 1.7 |
| Germany | 5.7* | 2.0* | 1.2 |
| Italy | 4.9 | 2.3 | 1.5 |
| Japan | 8.2 | 2.6 | 1.2 |
| United Kingdom | 2.4 | 1.8 | 2.5 |
| United States | 2.2 | 1.5 | 2.2 |

*Applies to West Germany only.
*Source*: Maddison (2006)

It is important to note the not just war facilitates rapid economic growth under Olson's logic. In *The Varieties of Eurosclerosis* (hereafter VOE) Olson (1996b) suggests that rapid economic growth can ensue following 'jurisdictional integration'. Olson remarks that some of the best examples of rapid economic growth pre-1900 occurred when counties, regions or states merged to form a larger institutional arrangement. Germany grew fastest during the nineteenth century following the establishment of a customs union in 1834 and unification in 1871. Japan had a similar experience following the Meiji Restoration of 1867–8. The Netherlands, France, the United States of America and the United Kingdom all report similar experiences on the back of the establishment of a new jurisdictional agreement or the integration of one jurisdiction with another of similar economic standing. Olson (1982) suggests this is the RADON and reiterates it in VOE. Given the destructed power or war not to mention the loss of life, overcoming institutional sclerosis in this way is highly inefficient

and costly. The only satisfactory means of counteracting 'British Disease' is through non-violent means – jurisdictional integration (Considine & Butler, 2010).

While this section does not deal with Olson's final conclusion – economic understanding could minimise and overcome institutional sclerosis – he does allude to a possible role for this in the RADON. Olson (1982:237) states that

> "May we not reasonably expect, if special interests are (as I have claimed) harmful to economic growth, full employment, coherent government, equal opportunity, and social mobility, that students of the matter will become increasing aware of this as time goes on? And that the awareness will eventually spread to larger and larger proportions of the population? And that this wider awareness will greatly limit the losses from special interests? That is what I expect at least when I am searching for a happy ending".

Furthermore, in the VOE Olson (1996b:80 & 92) suggests

> "It is possible that the countries that suffered the most (or suffered in the least opaque ways) from special-interest cartelization and lobbying would be more susceptible to analyses of the problem, and come to have a bit more of an appreciation of it, than societies that had suffered less (or in ways that were harder to understand)…no historical process that is understood is inevitable"

The presence of institutional sclerosis, as Olson suggests in the final quotation is not inevitable, yet it persists throughout stable, democratic societies. To understand why, a brief description is provided on the concept of rational ignorance. Rational ignorance among the population, to the formation of destructive special-interest groups seeking to alter the collective gains made by society in their favour, is one of the fundamental reasons institutional sclerosis persists.

### 3.2.3 Rational Ignorance

The *RADON* briefly touches on the idea of rational ignorance. However, in 1989 Olson published *How Ideas Affect Society: Is Britain The Wave Of The Future* and devoted a full section of the paper to the concept of rational ignorance. By 1989 Olson was concerned "British Disease" posed a threat to all developed countries and that Great Britain's slow growth rate was simply the forerunner for all others to follow. Despite the fact the Olson (1989 & 1990) recognises Britain had no shortage of intelligent economic debate and had a higher number of economists per capita than most developed countries, the country was still unable to escape the ossifying disease of institutional sclerosis. Olson (1989) puts this down to what he calls "the single most important factor limiting the diffusion and political potency of better ideas: rational ignorance" (Olson, 1989:33).

To explain how rational ignorance allows institutional sclerosis to manifest itself in even the most economically aware countries, Olson uses the example of a single voter in a democratic state. The election of a national government is a point in case. When a citizen is given a set of candidates to choose from at election time, each must consider how much time to allocate to finding out about the policies and beliefs of each candidate standing for election in order to make an informed decision. However, should an individual do this, they will receive only a tiny fraction of the gains, if their research results in the election of candidates with effective policies. Therefore, each citizen has little incentive to spend time researching the candidates standing for election. Society would be far better off if every enfranchised citizen spent time researching policies and the potential effectiveness of each candidate standing for election. Olson (1989:34) clarifies this point by stating that:

> "The gain to a voter from studying issues and candidates until it is clear what vote is truly in his or her interest is given by the difference in the value *to the individual of*

*the 'right' election outcome, multiplied by the probability that a change in the individual vote will alter the outcome of the election*. Since the probability that a typical voter will change the outcome of the election is vanishingly small, the typical citizen, whether he is a physician or a taxi driver, is usually rationally ignorant about public affairs".

Olson (1989) alludes to Downs (1957), with the latter arguing that the rational ignorance of the average citizen allows ideologies to play a massive role in the public domain. Since it is not rational for people to acquire accurate information when deciding whom to vote for, many citizens allow ideologies to influence the decision as to which way they should vote. Herein lies the problem. Citizens often come to the same logical conclusion when faced with narrow special-interest groups. No single person is willing to tackle the group as the costs are borne by that individual and the benefits, if successfully, are dispersed among the entire population (outside of the special-interest group). Over time as states accumulate more and more special-interest groups the rational ignorance of the individual becomes more damaging and the rate of economic growth declines.

### 3.2.4. Opponent of the "Rise and Decline" Hypothesis – Criticism of Mancur Olson

The general popularity of Olson's 'rise and decline' hypothesis 'is mainly due to its parsimonious nature, which is intellectually challenging, aesthetically pleasing and can be applied to a wide variety of historical events (Unger & van Waarden, 1999). However, despite the widespread acceptance of Olson's work, there have been opponents to both his theoretical and conceptual ideas since the publication of the RADON in 1982. It is important to present these alternative explanations so that a holistic view on the development of states

over the past one-hundred and thirty years is afforded to readers. This sub-section attempts to do just that.

Convergence hypothesis theorists present the most obvious alternative to Olson's explanations for the performance of developed countries during the twentieth century. Solow (1956), Swan (1956), Romer (1986) and Lucas (1988) all present extensive evidence to suggest the rapid economic development experienced by Germany, Italy and Japan post-1945 can be explained by catch-up growth. The extensive destruction of physical capital in these countries, particularly from 1943 to 1945, resulted in the need for enormous rebuilding programmes after World War II. Solow (1956) and others suggest the surge in economic growth of the developed world from 1945 to 1973 has nothing to do with an undercutting of vested interest groups and can simply be attributed to the replenishment of the stock of physical capital destroyed by war. This criticism of Olson's hypothesis is quite general and is simply an alternative perspective, of which there are many, of the causes of economic growth. However, others have directly questioned Olson's theories of economic growth and state development. Such criticism includes Weede (1986), Cameron (1988), Maddison (1995) Unger & van Waarden (1999) and Hóijer (2004). This section will take each of Olson's three key books in turn and provide a brief review of criticism. The books are addressed as follows; The Logic of Collective Action (LCA), The Rise and Decline of Nations (RADON) and Olson's last work, published posthumously in 2000, Power and Prosperity (PAP).

Concerning the LCA, Cameron (1988) argues Olson's theory rests on a number of implausible assumptions. The author claims the view that groups are the fundamental constituent of society is outdated or even obsolete and suggests Olson's focus is primarily on the growth-retarding aspects of group formation. Groups could be growth-promoting under

the right conditions. Olson (1990) does address this issue using the case of Sweden (discussed in sub-section 3.2.1.1). Furthermore, Cameron (1988) suggests the theoretical and conceptual framework presented by Olson makes no allowance for the possibility individuals in society pursue interests extending beyond the interest of their narrow group. Cameron takes issue with Olson's conclusion that the objectives and success of the group rests entirely upon the "internal attributes" of the group such as size (Cameron, 1988:565). The author argues that size is less important than the relationship group members have with one another or the incentive structures in place within the group. Finally, Cameron (1988) suggests governments may act outside the influence or control of special interest groups despite their number or apparent size.

Unger and van Waarden (1999) present a critique of Olson's RADON and suggest Olson's framework is in need of revision. Like Cameron (1988), the authors commend Olson on the parsimonious nature of his hypothesis but find fault with many of the assumptions underlying his explanations for the rise and decline of states during the twentieth century. Unger and van Waarden (1999) suggest three points, which undermine Olson's hypothesis. Firstly, based on data the authors collect for Canada, the Netherlands, Sweden, the United Kingdom and the United States, they find the number of trade associations and trade unions began to *decline* after World War II. Secondly, data collected for Austria, Canada, Italy, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and West Germany indicates that the number of associations in the defeated Axis countries, and the average age of these associations, was greater than associations in the victorious state. This would appear to contradict Olson's view that revolutions, occupations and internal upheaval destroyed vested interest groups. Finally, Unger and van Waarden (1999) suggest interest associations and lobby groups are not detrimental to economic performance and can in fact make a positive

contribution to growth. The authors, like Cameron (1988), suggest Olson only views the negative when considering vested interests and as such makes the assumption that they are solely interested in a redistribution of the societal gains towards themselves, and have no interest in production. However, Unger and van Waarden (1999) counter this view and argue many Western European interest groups assist in the production process by correcting market failures.

Lastly, Hoijer (2004) provides a critique of Olson's final work PAP. Olson (2000) argues that state development begins to occur once a bandit becomes stationary and has an incentive to provide public goods to subjects living under their control. Such conditions are not automatic and are sometimes down to sheer luck. Section 4.4.3 addresses this perspective of state development. Hóijer (2004) argues Olson's ideas in PAP, whilst providing some useful insights, do not constitute an acceptable theory of state-development. Hóijer (2004) suggests two main problems with Olson's framework. Firstly, if two equilibriums can exist, one with competitive theft (roving bandits) and the other where theft is monopolised (stationary bandit) how can state development occur if competitive theft is ubiquitous. No incentive exists for a competing bandit to break from the group and attempt to monopolise theft (Hóijer, 2004). Additionally, if a bandit manages to monopolise theft in a geographic region Hóijer (2004) assumes this also means the bandit has a monopoly on violence. Such an assumption "appears circular, since a 'monopoly on violence' seems to constitute both 'cause' and 'effect'" (Hóijer, 2004:36).

## 3.3 MODELLING INSTITUTIONAL FLEXIBILITY

This section provides a brief discussion for what follows in Chapters 5 and 6 regarding institutional flexibility and the fusing of Black's conceptual model of state development with North, Wallis & Weingast 's stages of state development and Olson's theories of collective action and institutional sclerosis into a logical 'rise and decline' hypothesis so that empirical tests can be conducted. Chapter 5 outlines the methods used to apply these three to the empirical results presented in Chapter 6. While attempts have been made, most notably by Choi (1983) and Hodgson (1989), to fuse the Black and Olson, this work builds on these earlier attempts using a new methodological approach. This approach is now discussed.

### 3.3.1 Institutional Flexibility

As outlined in the opening chapter, institutions are essential for economic growth. Among others, Barro (1991), Knack & Philip (1995), Rodrik (2007) and Acemoglu & Robinson (2012) have rigorously proved this line of reasoning. When considering institutional explanations for economic growth, much of the research in the area has focused on the impact of meta-institutional arrangement on economic growth or institutional efficiency. Very little attention has been diverted to the determinants and effect of institutional flexibility. Olson's hypothesis attempts to redress this imbalance and emphasises the rise and decline of states. This is in effect the same as an increase and decrease in the productive capacity of institutions of the state. In the absence of disruptive events and interruptions, which encourage the establishment of new institutions and practices, it is logical to believe institutions display growth-retarding characteristics over time. Institutional flexibility is used to determine the extent to which the institutional structures of the state promote or retard economic growth. This theory is grounded in Olsonion logic. Under this logic

following internal upheaval (end of World War II in Germany) or jurisdictional integration (enlargement of the European Union during the 1970s following British, Irish and Danish accession) institutional flexibility in countries experiencing either will subsequently increase. This surge in flexibility, of the machinery of the state, is a consequence of an undercutting of the wider institutional sclerosis existing under previous governments. However following a period of stability, institutional flexibility peaks and begins to decline. The reasons for this are Olsonion in nature and are discussed at length in Section 3.2.

History provides many examples illustrating the profound importance of institutional flexibility in determining economic growth. Milgrom, North & Weingast (1990), North (1991) and Grief (1994) all note the importance of institutional flexibility in allowing institutional innovations in the judiciary, foreign trade, measurement and accounting practices and insurance contracts. De Soto (2000:106) argues greater institutional flexibility in the United States of America historically allowed for more "dynamic property rights". Furthermore, historical accounts by Olson (1982), Gimond (2002) and Kuran (2004) demonstrate how a lack of institutional flexibility can delay or prevent economic growth. As discussed, Olson (1982) uses the case of 1970s Great Britain to illustrate this point. Gimond (2002) argues institutional inflexibility in Japan during the 1990s resulted in a paralysis of the political process and the Japanese parliament, leading to prolonged stagnation. Kuran (2004) takes a more long-term view and claims inheritance and contract law in Islamic countries during the late Middle Ages did not support commercial enterprises. Not only did this result in a dearth of private companies but "…turned into handicaps by perpetuating themselves (Islamic countries) during the long period when the West developed the institutions of the modern economy" (Kuran, 2004:72).

### 3.3.2 Fusing Black, Choi, North, Hodgson & Olson

The availability of reliable and consistent data means that it is virtually impossible to fuse the earlier years selected by Black (1966) for the Challenge of Modernity (COM) and Consolidation of Modern Leadership (CML) with Olson's logic of collective action. Furthermore, the absence of democracy during these two periods, which North, Wallis & Weingast 's (2009) describe as phases of the autocratic state, devoid of democracy, ensures mass collective action did not persist. Instead, the fusing of all three concepts is concentrated around Black's staring years of Economic and Social Transformation (EST). The starting EST year is selected as all ending years are within the period 1880 to 2008; the same timeframe examined in the empirical tests in Chapter 6. Furthermore, mass democracy, a key determinant of collective action came to all countries in the sample during the years of EST. For this reason, it is possible to apply a new approach to determine an appropriate year for the peak of institutional flexibility and the subsequent onset of institutional sclerosis.

The most notable previous attempts to fuse Black and Olson have been attempted by Olson's student Kwang Choi. Choi (1983) uses a rising logistic curve to reflect the 'sclerosis' that occurs due to stability, the passage of time and the selected interests of small groups. Choi selects the CLM years proposed by Black (1966) in the formulation of this logistic curve. The approach assumes the states begin with no sclerosis and no interest group interference. Hodgson (1989) attempts to extend Choi's analysis and disputes the assumption of no prior sclerosis. Hodgson suggests the curve which could estimate the importance of institutional flexibility through time is more likely to be an inverted U-shape. Like Choi (1983) Hodgson (1989) uses Black's years, selecting the start year of EST as the high point of institutional flexibility for each country, with institutional sclerosis setting in thereafter. The zenith of this

curve represents the year institutions have the greater level of malleability and capacity, promoting and organising new ideas and routines. In addition, following the peak of the inverted U-shaped curve, institutional flexibility begins to decline as institutions, routines and habits become older and less receptive to change. In the absence of disruptive events, which could undermine the status quo and create newer institutions and routines, flexibility declines, inertia sets in and the ossification of the system is the result.

The problem with this approach is the Black year for the commencement of EST used by Hodgson (1989) marks the starting point in a phase of state development. These EST starting years include events such as national independence, integration into a large jurisdiction or the end of a period of major conflict (See Table 2.4.2). Under Olsonian logic, such events destroy vested interests and greatly reduce the level of institutional sclerosis. New institutional structures are created in the wake of these events which, as passed evidence has shown, lead to higher levels of economic growth. Assuming this logic is correct, the inverted U-shaped curve should not peak at the start year of EST. Instead this year of EST should correspond to the commencement of the rising portion of the institutional flexibility curve. This leads to a further problem; in what year does the curve reach its zenith? This the same as asking in what year does institutional sclerosis become so rampant that the rate of economic growth declines year on year.

In order to establish a peak year, this research applies a rising logistic curve to democracy data collated from both Flora (1983) and the *International Institute of Democracy and Electoral Assistance* (2012). To elaborate briefly on this, a logistic curve is applied to democracy data for each country from 1880 to 2008. Democracy is measured as the percentage of the population above the legal voting age with voting rights. Once the logistic

curve has been applied, the year democracy is increasing at the fastest rate, is chosen as the peak in the inverted U-shaped curve. This year is assumed to be the year in which collective action becomes accessible to the mass of the population. Thereafter, increases in the rate of enfranchisement of the percentage of the population above the legal voting age, begin to slow. However by this point of development, collective action is achievable to the majority of the population and institutional sclerosis sets in causing the rate of economic growth to decline. This is reflected in the downward sloping of the inverted U-shaped curve. Figure 3.3.1 illustrates the difference between the inverted U-shape used by Hodgson (1989) to model institutional flexibility and this approach used in this thesis.

Figure 3.3.1: Measure of Institutional Flexibilty Through Time

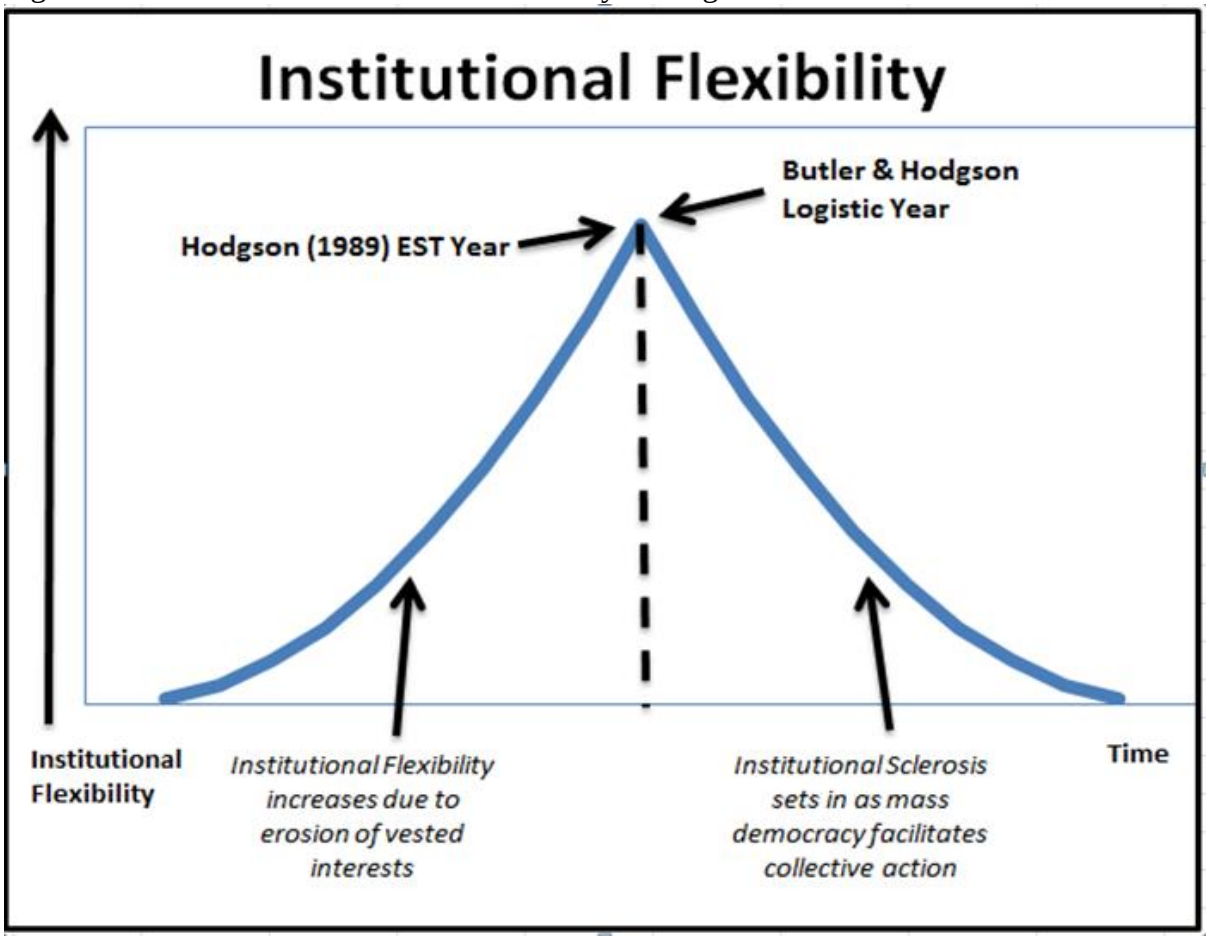



Figure 3.3.1 illustrates the difference between the approach taken by Hodgson (1989) and this work when attempting to integrate Black's years to Olson's theory concerning the patterns of

cross-country economic growth. The key difference between the two is the replacement of the Black EST year as the high point of institutional flexibility with a logistic curve based on the spread of democracy. This approach is deemed to be more appropriate as the Black EST year is more likely to result in an increase in institutional flexibility, as the special-interest groups Olson claims are so damaging to economic progress, are destroyed with the commencement of EST. Further explanation of the illustration above is discussed in Chapter 5. The empirical results of this approach are discussed in Chapter 6.

## 3.4 CONCLUSION

This chapter attempts to achieve a number of goals. Firstly, the chapter seeks to provide the reader with an overview of the key contributions of Mancur Olson. Attention focusses on Olson's earlier work, in particular his interpretation of the logic of collective and second-order and third-order implications of this logic. Olson's most cited work, *The Rise and Decline of Nations* is examined in detail to provide the reader with an overview of how Olsonion logic is applicable to the economic performance of countries across time. This is essential as it remains the single most important application of Olson's theory to cross-country data. The importance of the British experience over the past three hundred year stands out as the Olsonion exemplar. The British experience is captured by Figure 3.3.1, as a period of rapid economic growth due to the creation of a new institutional framework, which facilitated the industrial revolution, followed by a subsequent decline as stability, the passage of time and the spread of democracy permitted the onset on institutional sclerosis. The decline of Great Britain is so pronounced Olson coined the term *British Disease*. The disease is in no way innately British and as Table 3.2.1 demonstrates, institutional sclerosis spread to other major world economies. This chapter attempts to explain why this persisted despite the fact that institutional sclerosis is understood and highlighted the role of rational ignorance. The logic behind rational ignorance provides an explanation as to why the population at large does nothing, when faced with slowing economic growth. The voting metaphor is used to explain why rational ignorance persists and captures the incentives facing the average citizen when asked to elect candidates to a local or national assembly.

Finally, the chapter addresses what institutional flexibility is and how this research will fuse the concept of institutional flexibility into the ideas of Black (1966), Olson (1982) and North, Wallis & Weingast (2009) and in doing so build on earlier investigations by Choi (1983) and

Hodgson (1989). A measure of institutional flexibility is presented and assumed to follow an inverted U-shape. The rising side of the curve represents a period of increasing institutional flexibility, facilitated by the development of the state, and results in rapid economic growth. After a peak year of institutional flexibility a subsequent decline sets in as institutional sclerosis ossifies once flexible institutions, leading to slower economic growth. The logic behind this approach is discussed further in Chapter 5 and empirical tests of the hypothesis are presented and discussed in Chapter 6.

# CHAPTER 4 – DEMOCRACY AND ECONOMIC GROWTH

## 4.1 INTRODUCTION

The interplay between economic growth and democracy has been an area of interest across the social sciences for many years. In recent times, a vast array of literature has been produced investigating the relationship between the two variables. Two fundamental questions are posed by most researchers in the area. What way does causation between the two variables run and, once causation is established, what impact does one have on the other. Economists have concentrated their attention on the impact of democracy on economic growth, while political scientists have examined the influence of economic growth on democracy (Naryan, Naryan and Smyth, 2011). The results are so far inconclusive and offer a challenge to those seeking to understand the complex and often perplexing relationship between the two.

While neither modern economic growth, nor mass democracy started to emerge until the latter part of the nineteenth century, an interest in the relationship between the two materialised long before. One of the first investigations into this relationship can be traced back to the mid sixteen-hundreds with the publication of English philosopher Thomas Hobbes' book *Leviathan*. Kurzman, Werum and Burkhart (2002) cite this work as the first attempt to promote the idea that the level of democracy and the rate of economic growth were linked with the latter dependent on regime type. A conflicting hypothesis is provided by Lipset (1959). The Lipset Hypothesis [7] suggests the level of democracy is dependent

[7] Lipset (1959:75) stated that "From Aristotle down to the present, men have argued that only in a wealthy society in which relatively few citizens lived in real poverty could a situation exist in which the mass of the population could intelligently participate in politics and could develop the self-restraint necessary to avoid succumbing to the appeals of irresponsible demagogues".

upon the rate of economic growth. An investigation into the likely direction of causation between democracy and economic growth follows in this chapter.

The second question posed by researchers in the area is, once the nature of the relationship between economic growth and democracy is established, what impact does one have on the other? The much cited work of Sirowy and Inkeles (1990) proposes three explanations. The first is that democracy and economic growth have a positive relationship, confirming what is known as the "compatibility hypothesis". The second is that the two are opposing forces, with one having a negative impact on the other, otherwise known as the "conflict hypothesis". The third explanation is known as the "sceptical hypothesis" and claims no relationship exists between the two. All three are examined in this chapter.

Investigations into the economic growth and democracy relationship have examined samples of developed and developing countries, together and separately. The vast majority of research conducted runs from post-World War II due to a lack of data prior to 1945. Different researchers have produced conflicting evidence as to the nature of the relationship. Sirowy and Inkeles (1990) investigate thirteen studies and find that four support the "compatibility" hypothesis, four the "conflict" hypothesis and the remaining six the "sceptical hypothesis". Przeworski and Limongi (1993) review eighteen empirical papers and find the results are almost equally divided between democracy promoting growth and preventing growth. Of the eighteen, eight find that democracy promotes growth; eight find democracy slows growth when compared to an authoritarian regime, while two find that no relationship exists. Borner, Brunetti & Weder (1995) survey sixteen studies and find three studies suggest a positive relationship exists between democracy and growth, three a negative relationship, with ten suggesting no relationship. From an examination of

seventeen previous studies, Brunetti (1997) concludes nine confirm the "sceptical" hypothesis, four the "conflict" hypothesis and the remaining four the "compatibility" hypothesis. Finally, a more recent meta-analysis by Doucouliagos & Ulubasoglu (2008) on eighty-four democracy-growth publications find 27% of the results are statistically significant and confirm the "compatibility hypothesis" while 15% are statistically significant but confirm the "conflict hypothesis". The remaining 58% are split between the two hypotheses but the results are not statistically significant.

From the outset, it is important to note while the definition of democracy is open to interpretation, sometimes being equated simply with the entitlement to vote (Cheung, 1998), the definition by Rivera-Batiz and Rivera-Batiz (2002:135) is generally accepted as best capturing the concept. The authors define democracy as the extent to which "a country has checks and balances on executive powers, constitutional processes and guarantees, freedom of the press and the absence of censorship, clear and effective judicial and legal structures, incumbent term limits and transparency, openness and citizen input in policymaking". The remainder of this chapter is presented as follows: Section 4.2 examines the nature of causation between the two variables. Section 4.3 discusses measures of democracy used in previous empirical investigations while Section 4.4 discusses the findings of these previous investigations. Section 4.5 concludes the chapter.

## 4.2 THE RELATIONSHIP BEWTEEN DEMOCRACY & ECONOMIC GROWTH

One of the central problems researchers in this area have had to overcome is endogeneity in the relationship between economic growth and democracy. If democracy is able to enhance economic growth, does economic growth then lead to increased levels of democracy, a relationship known as the Lipset Hypothesis? In order to examine the question of endogenity the relationship between the two must be viewed from a historical perspective. A serious shortcoming of much work in this area is the failure to recognise that the origins of democracy can be traced back more than two-hundred years, with the roots of Western democratization to be found in France and Great Britain. Attempting to interpret the relationship between the two variables in the mid to late twentieth century, often results in a failure to understand how democracy emerged in the first instance.

Acemoglu & Robinson (2000) offer an excellent insight on the debate of causation. It is the view of Acemoglu & Robinson that the origins of Western democracy are not a result of economic growth. It is from this standpoint the remainder of this chapter and subsequent chapters take inspiration. The authors offer various explanations for the extension of franchise among the people of Western Europe during the nineteenth century. Acemoglu &Robinson (2000) suggest the extension of voting rights, to the majority of the adult population, was not driven by economic growth but more likely the threat of revolution, the Enlightenment, political party competition and a middle class drive to recognise the lower classes. Furthermore, developed democracies were not conceived in a short period of time but instead have profound roots, stretching back centuries in some cases and the consequence of cultural, economic, political and social conditions (Collier, 1999; Hite and Cesarini, 2004; Gerring, Bond, Barndt & Moreno, 2005; Persson & Tabellini, 2006). Finally, Gerring,

Kingston, Lange and Sinha (2011) suggest the most important driver of democracy is not economic growth but simply gaining independence.

The first of these explanations, the threat of revolution, is probably the most likely cause for the spread of democracy in Western Europe. Milestones in the extension of democracy in Great Britain occurred in 1832, 1867, 1884, 1918 and 1928. When the first reform to electoral practices was in the process of passing through the British parliament, the then Prime Minister, Earl Grey, publically acknowledged his dissent to the act but insisted the reforms were implemented in order 'to preserve, not to overthrow" the current establishment (Evans, 1983:266). Darvall (1934), Briggs (1959) and Lee (1994) agree with this assessment, insisting that the extension of democratic freedoms across Britain during the 1800s were used, to prevent the spread of civil unrest and possible revolution. Stevenson (1979) and Acemoglu & Robinson (2000) indicate the years preceding the 1832 Reform Act in Britain were epitomised by an unparalleled level of civil unrest. This unrest manifested itself in events such as the Luddite Riots, the Spa Field Riots and the Swing Riots (Stevenson, 1979; Nasar, 2011). The impact that the spread of democracy would have on economic growth was a point of much debate. Collini, Winch & Borrow (1983) and Przeworski and Limongi (1993) both cite Scottish philosopher James Mackintosh, who in 1818 predicted that, an extension of franchise to the working class would result in a permanent struggle between the masses and those owning property. Whig politician, Thomas Macaulay, went even further and in 1900 declared that the spread of democracy would result in the end of private property ownership.

Further extensions in democracy were granted during the mid-nineteenth century in order to avert the restoration of political extremism in Britain (Lee, 1994). The second Reform Act of 1867 was not caused by economic growth but the opposite, a severe recession, which again

threatened to result in civil unrest (Trevelyan, 1937; Harrison, 1965; Searle, 1993; Lee, 1994). The treat of revolution in 1867 led to an extension of the franchise from 1.4 million people to 2.52 million, with working-class voters becoming the largest bloc of voters in all metropolitan constituencies (Acemoglu & Robinson, 2000). Female suffrage, eventually granted in Britain in 1928, was the result of an organised, antagonistic movement. A leader in the movement, Emmeline Pankhurst declared that "Parliament never grants (democratic) reform unless it is terrorised" (Jorgensen-Earp, 1997:48).

Increases in democratic rights due to the fear of revolution were not confined to Britain. Continental Europe experienced the same phenomenon as voting numbers increased, due to the prevalence of civil unrest, which threaten the establishment. In France, the 1848 revolution led to the founding of the Second Republic which granted universal male suffrage (Collier, 1999). Germany had a similar experience. The 1848 revolution in Germany resulted in a significant enlargement in the number of people eligible to vote across almost every German state, for fear of further revolution (Blackbourn, 1998). The spread of democracy in Sweden is delineated by two major milestones; the reforms of 1909 and 1918 (Acemoglu & Robinson, 2000). The 1909 reform was preceded by a series of strikes and public demonstrations. The 1918 reforms, extending suffrage to all male adults, occurred in the shadow of worker protests. These were as a result of a harsh economic downturn and reached the point where the threat of revolution was recognised by the incumbent Swedish government as a serious possibility (Tilton, 1974; Collier, 1999).

The threat of revolution is not the only hypothesis forwarded by Acemoglu & Robinson (2000) to explain the spread of democracy across Western Europe. A change in social values due to the Enlightenment is another possible explanation, as the rights of the lower classes

and women began to be recognised. The timing of democratic reforms in Western Europe, many not arriving until the early to mid-twentieth century, suggests this explanation is not as likely as the first. Acemoglu & Robinson (2000) claim revolution rather than enlightenment, is the most likely explanation for the spread of democracy as it was forced upon the establishment rather than being a course plotted.

Himmelfarb (1966) and Collier (1999) both suggest the reasons behind the increasing level of democracy in Britain was a result of political party competition. The inspiration for this is drawn from the fierce competition between William Gladstone and Benjamin Disraeli in the House of Commons during the 1860s and 1870s. An extension of the franchise during these decades could be viewed as a means of capturing newly enfranchised voters, appreciative of the rights bestowed upon them by the reforming government. Acemoglu & Robinson (2000) argue this hypothesis is again not as plausible as the 'threat of revolution', because democratic reforms did not result in winning general elections. It is more plausible that mounting social pressures forced both Gladstone and Disraeli into an extension of democratic rights across Britain.

Political competition can also result in 'lucky circumstances' which cause an extension of democratic to occur. As discussed in Chapter 3, Olson (1993) addresses the stages a country goes through in moving from an autocracy to a democracy. Olson (1993) suggests, after a successful revolution and the removal of the incumbent, the period of instability that follows will result in either another dictator taking power or the emergence of a fledgling democracy. The latter will only occur if political competition is structured in such a way that no single person or group of people has enough support to seize power. The conditions necessary for this to arise are often down to chance, but if such circumstances do arise, power must be

shared, forcing those seeking power to establish a democratic system. Acemoglu & Robinson (2000) point out such conditions were met following the 1870 Paris Commune. No one group was in a position to seize and remain in power, forcing all factions to come together.

The final hypothesis suggested by Acemoglu & Robinson (2000) for the spread of democracy in Western Europe was due to a middle class drive to shift the balance of power in its favour. The inclusion of the lower classes in the democratic process had consequences for taxation and political control. The middle classes saw this as a means of increasing their influence in rapidly modernising Britain. Again, Cowling (1967) Smith (1976) and Acemoglu & Robinson (2000) suggest this is not highly plausible due to the reluctance of both the middle and upper classes to hand power to the trade unions and the "rule of numbers" by extending suffrage to the poor. Smith (1967:27-28) quotes a leading Conservative at the time, Viscount Cranborne, who declared reform of democratic procedures and entitlements was "a battle not of parties, but of classes…[and] a portion of the great political struggle of our century – the struggle between property…and mere numbers". An analysis of changes to voting rights from 1820 to 1975, in the eleven European countries examined in the empirical investigations following in Chapter 6, is provided in Appendix 3.1

## 4.3 MEASUREMENTS OF DEMOCRACY

Since empirical studies into democracy started, various methods have been used to measure the variable. Among the measures used to quantify democracy some of the more popularised attempts have been the *Index of Democratization**, the *Industrialization and Political Democracy Dataset*** and the *Democracy Index****. Table 3.3.1 below outlines existing datasets on democracy and is based upon the table produced by Munck & Verkuilen (2002).

**Table 4.3.1 Existing Datasets on Democracy**

| Dataset & Latest Year Published | No. of Countries | Year(s) Covered |
|---|---|---|
| Alvarez, Cheibub, Limongi & Przeworksi (1996) | 141 | 1950 - 1990 |
| Arat* (1991) | 152 | 1948 - 1982 |
| Bollen** (1993) | 153 | 1980 |
| Coppedge & Polyarchy (1991) | 170 | 1985 |
| Economist Intelligence Unit*** (2012) | 167 | 2006 - 2012 |
| Freedom House Gastil Index (2010) | 195 | 1972 - 2010 |
| Gasiorowski Political Regime Change (1996) | 97 | 1992 |
| Hadenius (1992) | 132 | 1988 |
| Marshall, Gurr & Jaggers (2010) (Polity IV) | 161 | 1800 - 2010 |
| Vanhanen (2000) | 187 | 1810 - 1998 |

Despite various measures, a survey of literature from the past forty years indicates the two most popular measures of democracy are the Freedom House Gastil Index and the Polity IV database. An explanation of each of these is now provided. Munck & Verkuilen (2002) provide a detailed examination of the challenges and shortcomings associated with the construction and interpretation of democracy indices.

### 4.3.1 Freedom House Gastil Index

The Gastil Index, named after its creator Raymond Gastil, began in 1973. It is produced annually and measures democracy or political freedom in countries across the world. The level of civil rights and political freedom for each country is gauged on a seven-point scale. Each country is then classified as “free” (score between 1 and 2.5), “partly free” (score

between 2.51 and 5.5) or "not free" (score above 5.51). Countries that are classified as "free" display the characteristics of both "electoral" and "liberal democracies". Electoral democracies are competitive, multi-party systems with regularly contested, secret ballot elections and universal suffrage for all citizens above the legal voting age. Campaigning by political parties is open and accessible to the media and public. Elections are free from voter fraud or corruption. Liberal democracies possess a substantial array of civil liberties such as freedom of religion, the right to privacy and the right to a fair trial. All "free" countries in the Gastil Index are both electoral and liberal democracies.

### 4.3.2Polity IV

The Polity IV project is a database used to measure the effectiveness of institutions in sustaining and promoting economic growth. The Polity IV dataset covers a total of one hundred and sixty-four countries from 1800 to 2010. The original Polity I dataset was constructed by Ted Robert Gurr and informed by foundational and collaborative work Gurr conducted with Harry Eckstein. The database is widely used to quantify democracy in different countries as it examines the connection between the quality of democracy and institutions of the state. Three general categories are observed; autocracies, hybrid regimes and democracies. A 'Polity score' is used to distinguish the degree to which a country displays the characteristics of an autocracy, democracy or mixture between the two. With three notable exceptions, the Polity score is measure on 21 point scale from -10 (hereditary monarchy) to +10 (consolidated democracy). A score of -10 to -6 indicates the existence of an autocracy. Countries rated -5 to +5 are considered hybrid regimes, while a score of +6 to +10 implies a country is fully democratic. Three special values of -66, -77 and -88 are used during specific periods of unrest, war or constitutional crisis. The Polity IV dataset also measures the quality of two other institutional indicators used in the empirical test that

follow in Chapter 6; regime durability and political competition. A detailed explanation of both of these is presented in Section 5.2.9.

## 4.4 PREVIOUS STUDIES ON DEMOCRACY & ECONOMIC GROWTH

Previous investigations into the relationship have been many. To date, no encompassing or satisfactory conclusions have been reached regarding the impact of democracy on economic growth. Three separate strands can be identified in the research; those that find democracy has a positive impact on growth; those that find democracy has a negative impact on growth and those that find no relationship between the two. This can be attributed to differences in definitions, timeframes and sample sizes. Sirowy and Inkeles (1990) sum the problem up by claiming despite the attention devoted to examining this relationship the big questions remain unanswered. Ambiguity and conflicting results muddy the understanding of the impact of democracy on economic growth, with definitions, measurement and modelling disparities all contributing to a lack of clarity.

While Doucouliagos & Ulubasoglu (2008) correctly point out the relationship between economic growth and democracy has been at the centre of debate since the end of the World War II, the initial interest in the interaction between the two can be traced as far back to Hobbes (1651). Hobbes identifies the importance of government power, in promoting economic growth and argues societies are most likely to experience economic growth under an absolute dictator, as the despot cannot promote their own interest unless, first establishing a system protecting public interests and providing public goods, an argument echoed by Olson (2000). In the same decade Harrington (1656) notes the importance of establishing a democratic system in order to stimulate economic growth as a ruling government is as much likely to 'take as to make'. This subsection now examines the existing literature relating to the impact of democracy on economic growth. It is broken into three parts; those that find a positive relationship (compatibility hypothesis), those that find

an negative relationship (conflict hypothesis) and those that find no relationship (sceptical hypothesis).

### 4.4.1 Compatibility Hypothesis – Democracy is Growth-Promoting

This hypothesis is one of three suggested by Sirowy and Inkeles (1990) and Naryan, Naryan and Smyth (2011) as potentially answering the democracy and economic growth dilemma. A primary function of democracy is the establishment of a complex, heterogenetic system, preventing rent-seeking behaviour by a would-be dictator (Olson, 2000). North (1990) argues countries that live under democratic rule incentive citizens to save and invest where they see fit. Democracies allow the allocation of scarce resources to areas the market deems they are best suited. Information and ideas flow freely throughout the system and are supported by secure property rights. These property rights ensure that indiscriminate pillaging, a common phenomenon in autocratic systems, does not occur. States with extensive democratic histories are predicted to adopt sounder policies allowing them to outperform authoritarian regimes or transitional democracies in the long run (Gerring, Bond, Barndt & Moreno, 2005; Rodrik, 2007).

The absence of a central planner or individuals seeking to create a monopoly on the right to govern indefinitely without recourse, ensures this system is more flexible to changing conditions and demands by citizens (Rodrik, 1998; Baum & Lake, 2003; Doucouliagos & Ulubasoglu, 2008). Furthermore, Bhagwati (1995) maintains democracies seldom engage in military conflict with one another, promoting global peace. McCord (1965), Goodin (1979), King (1981), Godell and Powelson (1982) and Kohli (1986) all claim democratic rule, which enables the existence of basic civil liberties and constitutional rights, promote conditions necessary for economic development.

As discussed in the previous chapter, Olson (1993 & 2000) develops a theoretical basis for the transition of a country to democracy. This interpretation of the evolution of a state, from rule by physical force to democratically elected government, is based on the premise of encompassing interests. The broader the interests of the elected government, the more encompassing that government will be, resulting in the development of public goods and sustainable economic development. The corollary of this is economic prosperity, as narrow special-interests are ignored. The efficiency of established democracies in resolving the dilemma of leadership succession, without civil upheaval or revolution, ensures economic growth can continue uninterrupted following a crisis of governance. While this might seem a trivial point to those living in developed democracies, it is a problem that plagues countries under authoritarian rule. The processes safeguarding a peaceful transition of power from one group to the next must be institutionalised in the political system, which by definition is enduring, thus guaranteeing stability in democracies (Gerring, Bond, Barndt & Moreno, 2005).

Empirical evidence of the growth-promoting nature of democracy is provided by Rodrik & Wacizarg (2005). Using the Polity 4 database for twenty-four developing countries, the authors find democratization has a positive impact on growth. Significantly, Rodrik & Wacizarg (2005) find those moving from low absolute levels of democracy to higher levels experienced much faster economic growth, as opposed to long established democracies, with higher absolute levels of enfranchisement among the population. An earlier study by Barro (1998) reports similar results, suggesting at low absolute levels of democracy more democracy raises economic growth for more than one hundred countries from 1960 to 1994. Gerring, Bond, Barndt & Moreno (2005) examine the impact of democracy on economic growth from 1950 to 2000 and conclude democracy does have a positive effect of economic

growth. Interestingly, the authors find that the stock of democracy or the cumulative effects of being a democratic country over many years, rather than simply the level of democracy at a point in time, significantly impacts upon economic growth. According to Gerring, Bond, Barndt & Moreno (2005), the passage of time and the degree of democracy "matter when considering the effect of democracy on growth". A later study by Gerring, Kingstone, Lange and Sinha (2011) reports older democracies grow faster than newer ones, *ceteris paribus*, contradicting the findings of Barro (1998) and Rodrik & Wacizarg (2005). A similar investigation by Minier (1998) examining changes in democracy and growth, finds countries that democratised earlier grew fasters than those failing to embrace democracy. Butiewicz & Yanikkaya (2006) report a positive relationship between democracy and economic growth, however these results are significantly affected by the sample size, classification used and estimation technique.

Additional investigations by Dick (1974), Kormendi and Meguire (1985), Pourgerami (1988 & 1991), Scully (1988 & 1992), Barro (1989), Grier and Tullock (1989) and Remmer (1990) all find democracy has a positive impact on economic growth. Dick (1974) examines fifty-nine developing countries from 1959 to 1968 and finds slightly faster growth rates in those that are democratic. Kormendi and Meguire (1985) examine forty-seven countries from 1950 to the second oil crisis in 1977 and find democracy is growth-promoting. Pourgerami (1988), Scully (1988 & 1992), Barro (1989), Grier and Tullock (1989) all examine sixty countries or more from the early 1960s to the mid-1980s and find democracy to be growth-promoting. Finally, Remmer (1990) examines eleven Latin American countries, for seven years, from 1982 to 1988. The author finds democracy has a positive relationship with economic growth but the results are not statistically significant. An analysis of all investigations is presented in Table 4.5.1.

A common tread connecting the growth-promoting hypothesis is the passage of time. Empirical research supporting this hypothesis is often confined to newly democratised countries or those moving from relatively low levels of democracy to higher levels. There would appear to be a threshold level of democracy, and once reached, enfranchising more of the population does not result in quicker growth. This explanation could be due to the development of new institutions, necessary to ensure the success of early democratisation, are already in place when enfranchisement is extended further and hence have no marginal positive impact on the economy. Since modern democracy can by definition, never go beyond one hundred per cent of the population, diminishing returns must set in at some point. Extending democratic rights further in an attempted to increase the rate of economic growth therefore must be futile. As discussed in Chapter 3, a further possible explanation is provided by Olson (1982). Once democracy reaches a certain point the sclerotic effects of narrow special-interest groups slows economic progress.

Before alternative hypothesises are discussed, it is important to note while some investigations have found no positive relationship between democracy and economic growth, positive indirect effects have been found. Sah (1991) and Rodrik (2007) find democratic states experience more predictable long run growth patterns as they are less susceptible to unpredictability in the short run, given the encompassing nature of decision-making. Consequently, this produces greater short-term stability, better management of economic shocks, resulting in improved distributional outcomes. Rodrik (2007) argues given this evidence, it can be reasonably suggested, democracies deliver higher-quality growth and do so mainly because of the institution building in participatory political regimes. Furthermore, both De Melo, Denizer and Gelb (1997) and Dethier, Ghanem and Zoli (1997) find that in the wake of the communist collapse in Eastern Europe, democracy was seen to have a positive

and significant effect of economic liberalisation. The authors consider this to be growth-promoting and an indirect consequence of the spread of democracy. Fidrmuc (2003) confirms the indirect, growth-promoting aspects of democracy.

Using democracy data from the Freedom House Gastil Index, Tavares and Wacziarg (2001) examine a sample of sixty-five countries from 1970 to 1989 using five year averages. The authors find capital accumulation and education both have a positive impact on economic growth and are directly influenced by the level of democracy, with higher levels equating to greater capital accumulation and education provision. Perotti (1996) finds democracies indirectly affect growth through the redistribution of incomes. The less democratic a country, the more uneven income is distributed, which in turn stifles economic growth. Helliwell (1994) finds indirect and positive effects with levels of investment and education both higher in democracies. Baum and Lake (2003) report democracy has an indirect effect on the rate of economic growth, positively influencing levels of human capital accumulation. Doucouliagos & Ulubasoglu (2008) endorse this view and find democracy only affects growth indirectly by positively impacting upon the accumulation of human capital. Doucouliagos & Ulubasoglu (2008) also find democracies promote economic growth by ensuring lower inflation rates and greater levels of price stability.

Future evidence of the indirect effects of democracy is presented by Feng (1997) who investigates ninety-six countries from 1960 to 1992 and finds democracy has a positive indirect effect upon growth by impacting upon the probabilities of regime change and constitutional government change from one ruling party to another. Finally, Barro (1998) examines a sample of over one hundred countries from 1965 to 1994 and finds that democracy has a positive and significant impact on life expectancy, the incidence of female

education numbers, enrolment numbers in primary school education across genders and reduces infant mortality rates, all of which help foster economic growth. These findings are consistent with Rodrik (2007) who also suggests an increase in democracy assists the establishment of economic freedoms.

### 4.4.2 Conflict Hypothesis – Democracy is Growth-Retarding

The second hypothesis suggested by Sirowy and Inkeles' (1990) as answering the democracy and economic growth conundrum, is that the two are in "conflict". Sirowy and Inkeles (1990) maintain democracy is regarded as an impediment to growth because rapid economic growth requires an autocratic ruler, with the power to subjugate the interests of the population, in order to forward a national agenda of economic development. Democracies by their very nature, act only to enhance special-interest groups and selective incentives, thereby eliminating the capacity of governments to act swiftly and effectively (Krueger, 1974; Olson, 1982; Sirowy and Inkeles, 1990).

As discussed in Chapter 3, Olson (1982) outlines this argument and suggests the relatively slow twentieth century growth rates of many developed democracies are a result of the cumulative effects of decades of democratic rule (see Table 3.2.1). Olson (1982) makes special reference to the growth performance of the United Kingdom during the last hundred years and argues the slower growth rate of the United Kingdom, when compared to its European counterparts, is a consequence of the stability of British society. This stability, coupled with the passage of time, is a fertile environment for the established of narrow special-interest groups with selective incentives, seeking to redistribute societal gains in their favour, often at the behest of economic progress. Kruegar (1974) and Bhagwati (1982)

both support this view, suggesting that democracies are pressured by rent-seeking activity into redistributing income to unproductive areas of the economy.

Extending this line of argument, democracies are seen to undermine investment. The shorter life span of democratic governments puts pressure on immediate consumption**.** De Schweintiz (1959) and Huntington (1968) are among the first to suggest democracies have fragile and precarious political institutions which are susceptible to immediate demands at the detriment of long term progress. The view is supported by the World Bank (1991) and Barro (1996). The conflict of interest, between the political and economic business cycles, results in unwise decision-making as politically popular decisions, aimed at getting politicians elected, often leads to ill-thought investment (Comeau, 2003; Doucouliagos & Ulubasoglu, 2008). An excellent appraisal of this standpoint is provided by Przeworski & Limongi (1993). As a starting point Przeworski & Limongi (1993) argue because the poor have a higher marginal propensity to consume and wish to consume immediately, the spread of democracy confers rights upon the poor enabling them to organise. Successful organisation can drive wages upwards and pressurises governments to redistribute income towards less wealthy members of society (Olson, 1982). The latter reduces the government's ability to spend, while the former reduces business profits, both of which combined to reduce investment. Assuming this logic is correct, democracy reduces investment thereby slowing the rate of economic growth.

Many empirical investigations support the "conflict" hypothesis". Helliwell (1994) examines the impact of democracy on economic growth for ninety-eight countries from 1960 to 1985. Helliwell (1994) finds democracy and economic growth are in directly conflict with one another however the reported results are not statistically significant.

Fidrmuc (2003) tests the performance of the post-communist countries of the former USSR and finds while some indirect effects are present, democracy alone has had a negative effect on economic growth. The two explanations for this forwarded by Fidrmuc (2003) are political uncertainty associated with newly formed democratic governments and the pressures of immediate consumption, as governments seek to maximise voter support and constrain the spending power of future, opposition governments, should they not win re-election.

Weingast (2005), Hodgson (2006b) and Butiewicz & Yanikkaya (2006) all argue democracies undermine investment and allow coalitions with selective interests to take root. Hodgson (2006b) finds democracy has had a negative effect on economic growth in the former Soviet Bloc since the fall of the Berlin Wall. The reason for this may be due to the fact democracy has allowed redistributive coalitions to form, hindering economic growth at the behest of society. Coupled with this, it appears as if the former Soviet countries exhibit Weingast's (2005) asymmetric equilibrium where the government tends to look after their own supporters and neglect the rest of society. Older investigations, confirming the results of Helliwell (1994), Fidrmuc (2003), Weingast (2005), Hodgson (2006b) and Butiewicz & Yanikkaya (2006), have been conducted by Przeworski (1966), Adelman & Morris (1967), Huntington and Dominguez (1975), Marsh (1979), Weede (1983), Landau (1986), Sloan and Tedin (1987) and Helliwell (1992). Przeworski (1966) investigates fifty-seven countries from 1949 to 1963 while Adelman & Morris (1967) examine an almost identical timeframe (1950 to 1964) for developing and communist countries. Huntington and Dominguez (1975) inspect thirty-five developing countries during the 1950s. Both Marsh (1979) and Weede (1983) test ninty-eight and one hundred and twenty-four countries respectively, with the latter's investigation from 1960 to 1974 and the former from 1955 to

1970. Helliwell (1992) examines ninety countries from 1960 to 1985; Landau (1986) observes sixty-five countries from 1970 to 1980, while Sloan and Tedin (1987) investigate the same period, minus one year (1970 – 1979). All research confirms the conflict hypothesis. Again, an analysis of all investigations is presented in Table 4.5.1.

### 4.4.3 Democracy has No Impact on Economic Growth

The final hypothesis suggested by Sirowy and Inkeles' (1990) is that democracy and economic growth have no relationship. This is known as the "sceptical" hypothesis. This idea is grounded in the belief that the level of democracy is not important. What is important is the stability of the government and its ability to adopt effective policies (Comeau, 2003). Sirowy and Inkeles' (1990) argue institutional structures determine the rate of economic growth. The nature of these institutional structures, for example the number of political parties, methods used to elect representatives or the prevalence of government intervention in economy, are far more important than the level of democracy. Clague, Keefer, Knack and Olson (1996) find rapid economic growth can occur under both democracies and dictatorships. The time horizon is the important factor, not the government style, with dictators capable of rapid economic growth should they comply with Olson's (2000) 'stationary bandit' and democracies capable of rapid growth should they secure property rights. Olson's stationary bandit has a monopoly on crime and is the only person who can tax or steal within a geographic area. The encompassing interest of this bandit makes them behave very differently than a 'roving bandit' as they have a super-encompassing interest in society. This gives the stationary bandit an incentive to provide public goods, spend recourses on productivity-enhancing activities and protect their domain.

A meta-analysis by Przeworski and Limongi (1993) confirms the "sceptical" hypothesis. The authors find no significant relationship between democracy and economic growth and conclude the relationship is spurious. This view is supported by investigations carried out before Przeworski and Limongi (1993) such as Kohli (1986), Marsh (1988) and Levine & Renelt (1992). Kohli (1986), using a sample of ten developing countries from 1960 to 1982, finds no difference in the growth performance of countries under democratic government or authoritarian rule. Marsh (1988) supports these findings from an examination of forty-seven countries from 1965 until 1984. Levine & Renelt (1992) find no robust relationship between the two, confirming the "sceptical" hypothesis.

## 4.5 DISCUSSION OF EMPIRICAL RESULTS

The difficulty when attempting to establish a common theme in the mass of empirical results is the lack of comparability of countries examined, sample size and timeframes considered. A major shortcoming of many empirical papers is the limited number of years the effect of democracy on economic growth is considered for and the treatment of developing and developed countries as one in the same. For these reasons it is not surprising the democracy and economic growth debate has produced many conflicting results. Table 4.5.1 attempts to overcome the problem of comparing results from different studies discussed in Section 4.4. The table lists a total of thirty-three empirical studies and illustrates the timeframe examined, the total number of years covered, the number of countries considered, the type of country considered[8], the method used to measure democracy and the hypothesis confirmed by the results. Of the thirty-three studies, nineteen consider a mix of both developing and developed countries with the remaining fourteen considering developing countries only. The earliest year considered in any study is 1950 with the latest 2005. Gerring, Bond, Barndt & Moreno (2005) examine the longest timeframe, a total of fifty-one years, from 1950 to 2000 and consider the most countries, with a total sample size of one hundred and eight-seven countries. A detailed examination of Table 4.5.1 illustrates some interesting findings.

### 4.5.1 Developed and Developing

Eight of the fourteen studies considering developing countries only, confirm the compatibility hypothesis. A further four confirm the conflict hypothesis, with the remaining two sceptical. Of the nineteen investigations that consider both developed and developing countries together, thirteen support the compatibility hypothesis, three the conflict hypothesis with a

[8] The type of country is simply a binary choice; developing or developed. No empirical study looks at just developed countries. The term mixed in Table 4.5.1 refers to a sample of both developing and developed countries.

further three the sceptical hypothesis. These findings appear to suggest that, in general, democracy has growth-promoting qualities for both developed and developing countries.

### 4.5.2 Measurement of Democracy

The results become more interesting when one considers the index or method used to quantify democracy. The Freedom House Gastil Index is by far the most prevalent democracy measure used and is applied to more than half of the studies (seventeen of thirty-three). Thirteen empirical studies using the Gastil Index confirm the compatibility hypothesis. Three studies find no relationship between democracy and growth. Only one investigation, Helliwell (1994,) uses the Gastil Index and finds the conflict hypothesis holds. It must be noted Helliwell (1994) applies both the Gastil Index and the Bollen Index together. Furthermore, while the conflict hypothesis is found to hold the results produced are not statistically significant.

The Polity score is the second most popular measurement of democracy. Like the Gastil Index, investigations using the Polity score confirm the compatibility hypothesis in five out of six investigations. Only Hodsgon (2006b) finds support for the conflict hypothesis using the Polity score. It is significant that, like Gastil and Polity, other measurements of democracy produce consistent findings. Bollen's Index is used on four occasions and confirms either the conflict or sceptical hypothesis. Pearson's Correlation Coefficient is applied to two studies both of which confirm the compatibility hypothesis. A simply one-zero dummy variable approach, employed by Landau (1986), confirms the sceptical hypothesis. These conclusions suggest the impact of democracy on economic growth has less to do with the level of development in a country and more to do with the method used to quantify democracy.

### 4.5.3 Length of Time Considered

A further important issue raised is the length of time examined in each empirical investigation. This interesting idiosyncrasy is raised due to the findings of Hodgson (2006b) when using the Polity score. The shorter timeframe examined by Hodgson (2006b produced results that conflicted with all other Polity based results. All other investigations using the Polity score in Table 4.5.1 consider thirty or more years. An examination of the number of years considered in each empirical investigation (See Table 4.5.1) indicates ten studies consider twenty-five years or more. Of these ten, seven produce results which support the compatibility hypothesis. Only one, Helliwell, (1994) finds a conflicting relationship between economic growth and democracy and this could be due to the use of the Bollen Index which confirms the conflict and sceptical hypothesis in the two other studies considered in Table 4.5.1. This appears to suggest the longer the timeframe considered, the more like democracy is to have a positive effect on economic growth.

**Table 4.5.1 Empirical Investigations Between Democracy and Economic Growth**

| Author(s) & Year | From - To | Years | Sample Size | Country Type | Democracy Measure | Hypothesis |
|---|---|---|---|---|---|---|
| Adelman & Morris (1967) | 1950 - 1964 | 15 | 74 | Developing Only | ISD Index | Conflict |
| Barro (1989) | 1960 - 1985 | 26 | 72 | Mixed | Gastil Index | Compatibility |
| Barro (1996) | 1960 - 1990 | 31 | 100 | Mixed | Gastil Index | Sceptical |
| Barro (1997) | 1972 - 1994 | 23 | 105 | Mixed | Gastil Index | Compatibility |
| Baum & Lake (2003) | 1967 - 1997 | 31 | 128 | Mixed | Polity Index | Compatibility (I) |
| Butiewicz & Yanikkaya (2006) | 1970 - 1999 | 30 | 114 | Mixed | Gastil Index & Polity IV | Compatibility |
| De Melo, Denizer & Gelb (1997) | 1989 - 1994 | 6 | 27 | Developing Only | Pearson Correlation Coefficient | Compatibility (I) |
| Dethier, Ghanem &Zoli (1997) | 1992 - 1997 | 6 | 25 | Developing Only | Pearson Correlation Coefficient | Compatibility (I) |
| Dick (1974) | 1959 - 1968 | 10 | 72 | Developing Only | Gastil Index | Compatibility |
| Feng (1997) | 1960 - 1992 | 33 | 40 | Developing Only | Polity Index | Compatibility (I) |
| Fidrmuc (2003) | 1990 - 2000 | 11 | 25 | Developing Only | Gastil Index | Compatability |
| Gerring, Bond, Barndt & Moreno (2005) | 1950 - 2000 | 51 | 187 | Mixed | Polity Index | Compatibility |
| Grier & Tullock (1989) | 1961 - 1980 | 30 | 113 | Mixed | Gastil Index | Compatibility |
| Helliwell (1994) | 1960 - 1985 | 26 | 98 | Mixed | Gastil Index & Bollen Index | Conflict |
| Hodgson (2006) | 1989 - 2005 | 17 | 27 | Developing Only | Polity Index | Conflict |
| Huntington & Dominguez (1975) | 1950 - 1959 | 10 | 35 | Developing Only | | Conflict |
| Kohli (1986) | 1960 - 1980 | 21 | 10 | Developing Only | Bollen Index of Democracy | Sceptical |
| Kormendi & Meguire (1985) | 1950 - 1977 | 18 | 47 | Mixed | Gastil Index | Compatability |
| Landau (1986) | 1960 - 1980 | 21 | 65 | Mixed | 0 - 1 Dummy Variable | Conflict |
| Marsh (1979) | 1955 - 1970 | 16 | 98 | Mixed | Bollen Index of Democracy | Conflict |
| Marsh (1988) | 1965 - 1984 | 20 | 55 | Mixed | Gastil Index | Sceptical |
| Minier (1998) | 1960 - 1989 | 30 | 148 | Mixed | Gastil Index | Compatibility |
| Naryan, Naryan & Smyth (2011) | 1972 - 2001 | 30 | 30 | Developing Only | Gastil Index | Sceptical |
| Perotti (1996) | 1960 - 1985 | 26 | 28 | Mixed | Gastil Index | Compatibility (I) |
| Pourgerami (1988) | 1965 - 1984 | 20 | 92 | Mixed | Political Repression Index | Compatability |
| Pourgerami (1991) | 1986 - 1986 | 1 | 106 | Developing Only | Gastil Index | Compatability |
| Remmer (1990) | 1982 - 1988 | 7 | 11 | Developing Only | Date since start of Democracy | Compatability |

| Author(s) & Year | From - To | Years | Sample Size | Country Type | Democracy Measure | Hypothesis |
|---|---|---|---|---|---|---|
| Rodrik & Wacizarg (2005) | 1964 - 2001 | 37 | 24 | Developing Only | Polity Index | Compatability |
| Scully (1988) | 1960 - 1980 | 21 | 115 | Mixed | Gastil Index | Compatability |
| Scully (1992) | 1960 - 1980 | 21 | 115 | Mixed | Gastil Index | Compatability |
| Sloan & Tedin (1987) | 1960 - 1979 | 20 | 20 | Developing Only | | Conflict |
| Tavares and Wacziarg (2001) | 1970 - 1989 | 20 | 65 | Mixed | Gastil Index | Compatibility (I) |
| Weede (1983) | 1960 - 1974 | 15 | 74 | Mixed | Bollen Index of Democracy | Sceptical |

Compatability (I) = Positive Indirect Impact on Economic Growth

## 4.6 CONCLUSION

This chapter seeks to provide an overview into the relationship between democracy and economic growth by answering three key questions. Firstly, what direction does the causation run? Secondly, if democracy does impact upon economic growth, what impact does it have? And thirdly, is there evidence to suggest that the timeframe examined, the total number of years covered, the number of countries considered, the type of country considered and the method used to measure democracy, impact upon empirical investigations. The emergence of modern democracy has its origins in the French Revolution and the parliamentary Reform Acts passed in the United Kingdom during the nineteenth century. The extension of democratic freedoms was not a direct result of economic growth but the fear of revolution which incumbent governments and elites viewed as a threat to their economic prosperity and social standing. The spread of democracy was as much an attempt by the ruling classes to preserve the status quo as it was by the rest of the population to undermine it. Other explanations for the spread of democracy in Western Europe include the Enlightenment, political party competition and a middle class drive to recognise the lower classes. While each of these could have played a part, none is as likely as the threat of revolution.

Despite the many attempts to address the question of democracy's impact on growth no satisfactory conclusion has been reached. Instead four separate strands have emerged, with positive direct effects, positive indirect effects, negative effects and no effects, all found to exist in different samples, at different times. Of the studies considered in this chapter, the majority of previous investigations support the view democracy is compatible with economic growth, either directly or indirectly. Democratisation of a country, in general, appears to promote economic growth. Furthermore, the extension of democracy appears to have a greater impact on economic growth when moving from lower relative levels to higher levels.

That said some investigations do report a negative relationship between the two variables or no relationship at all. An examination of previous empirical investigations appears to suggest the results are sensitive to sample size, timeframe considered and the measurement of democracy employed in the regression analysis. Both the Freedom House Gastil Index and Polity IV database, the two most popular measures of democracy, confirm the compatibility hypothesis in all but two cases. In contrast, Bollen's Index of democracy fails to find any growth-promoting aspects to democracy. The length of time examined appears to influence results with longer investigations more likely to confirm the growth-promoting properties of democracy.

# CHAPTER 5 – SOURCES OF DATA AND EMPIRICAL MODELS

## 5.1 INTRODUCTION

The principal research hypothesis asserts the transition to a modern capitalist economy depends largely on state development, state capacity and the integration and modernisation of institutions which support the state. In order to tackle a question like this, a long-term or evolutionary approach based on an extended data series is required. Mitchell (2007a) states although data for some countries is available back to the Middle Ages, it is all too often gathered and presented in an inadequate manner. While it would be worthwhile examining as far back in time as possible, it is often neither possible nor appropriate to go back beyond certain points in time when collecting data for many countries. It was not until the Industrial Revolution, its origins dated at the very earliest to the middle of the eighteenth century that countries began to record the output of various economic and social statistics in any sort of reliable manner.

Prior to a discussion of the data collection techniques employed, it is necessary to highlight some problems associated with using cross-country data over extended time horizons. According to Mitchell (2007a) the greatest of these is a lack of complete data for many countries, prior to World War Two. Similar but more discreet problems when using the data, are the presence of cross-country recordings which 'appear' to be reporting the same information but in fact are not. This problem is often one of definition, where one country reports a statistic in a different manner to another. For example, general government revenue as a percentage of national output may be reported as a percentage of gross domestic product in one country and gross national product in another. This research attempts to minimise these inconsistencies. Sometimes however, due to data constraints,

this has been impossible to avoid. Where this does happen, readers are made aware of any issues regarding the uniformity of the data.

It is important to note some additional issues that must be considered when using historical data. This first is that of the unknown competence of the collectors and publisher of past data. Due to the historic nature of all recorded observations it is often impossible to check the credibility of data and therefore, it must be accepted at face value as being correct. The second problem when using historical data is of greater concern; Mitchell (2007a) argues the most important methodological development of the twentieth century [was] the introduction of measurement in varying degrees in virtually every one of the social sciences. It is only since the late nineteenth and early twentieth century that data and statistical publications have been collected and produced for their own sake. Many series produced before the late nineteenth century should be viewed with a large degree of scepticism, a consequence of the incentives of misreporting or failing to report data. Examples of this include incorrect date of birth data in censuses in order to avoid, or partake, in wartime campaigns or incorrect reporting of imported or exported commodities to avoid duties and other taxes. Furthermore, countries often inflated statistics on population size or industrial output as a means of sabre-rattling in the age of imperialism (Mitchell, 2007a).

Due to a lack of reliable data, or in many cases the lack of any data, the empirical estimations in Chapter 6 are applied from 1880 to 2008. A sample of fifteen countries are considered, consisting of Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Norway, Switzerland, Sweden, The Netherlands, the United Kingdom and the Unites States of America. These countries are selected as they provided the longest and

most consistent time-series data, stretching back into the nineteenth century. Eight separate hypotheses, discussed later, are proposed as potentially answering the research question.

Data is obtained from a variety of sources, each of which is discussed in turn below. Given the length of time under examination, a primary objective of the collection and estimation of the data is to ensure it is consistent across individual countries for the duration of the time period examined. There are instances (which are documented later in the chapter), when data is unavailable, where interpolation, extrapolation or adjoining years are used to account for missing data. For the purposes of the empirical tests, the years 1914 to 1918 and 1939 to 1945 are omitted from the sample. Data is widely unavailable for many variables for these years. Given the disruption in all countries in the sample during both periods, interpolation of the data, used for other missing observations, was deemed inappropriate. The remainder of this chapter is presented as follows: Section 5.2 provides a detailed account of how the variables used in the empirical tests are sourced and constructed. Section 5.3 outlines the empirical models used in the regression analysis in Chapter 6. Section 5.4 presents newly created data and is one of the main contributions of this work. Section 5.5 concludes the chapter.

## 5.2 CONSTRUCTION OF VARIABLES

Data has been obtained from the following sources: The Australian Government (2012), Black (1966), The Economic History Association (2012), Engerman & Sokoloff (2005), The European Commission (2012) Flora (1983), Hodgson (1996), International Institute for Democracy and Electoral Assistance (2012), Maddisson (2006), Mitchell (2007a, 2007b & 2007c), Mackie (1982), Marshall, Gurr & Jaggers (2012), The Princeton Encyclopaedia of American Political History (2010), The Reserve Bank of Australia (2012), The United States Government Revenue History (2012) and The World Bank (2012). Each of these sources is now discussed.

### 5.2.1 Real GDP per Capita

The Development Centre Studies World Economy Historical Statistics is a joint project between the Angus Maddison Foundation and the Organisation for Economic Cooperation and Development (OECD). Maddison (2006) provides data on real GDP and real GDP per capita from 1AD to 2030 (estimations) for over 190 countries. Real GDP per capita is expressed in Geary-Khamis Dollars for all countries. This measure is sometimes referred to as the international dollar and is a hypothetical currency that exists only for cross-country comparison purposes. It is used to make comparisons between countries over time. The Geary-Khamis Dollar is based on the joint concepts of purchasing power parities and the international average price of products and services. The data uses 1990 as the base year with the purchasing power of all currencies converted to US dollars in that year. Making comparisons between GDP per capita in various countries in international dollars is an improved comparison tool rather than simply relying on nominal exchange rates. For the purposes of this research, data for real GDP per capita is collected from 1880 to 2008 for the fifteen countries in the sample. The rate of GDP per capita growth is calculated, for five

years intervals, from real GDP per capita data for the years 1880 to 2008. Data is available for all countries and for all years. No data for the dependent variable is interpolated or extrapolated.

### 5.2.2 Nominal National Output

Mitchell (2007a, 2007b, 2007c) provides data for a number of economic and institutional variables from 1750 to 2005 for countries across the world in *International Historical Statistics 1750 -2005*. Interest in a country's wealth and the income generated within its borders can be traced back centuries, however, it was not until the interwar period of the twentieth century that serious attempts were made to record national output correctly. The length and persistence of data is country-specific. Two countries, Sweden and the UK, have recorded time-series data stretching back to the eighteenth century. For other countries, such as Austria and Belgium, data becomes available from this source in the late nineteenth or early twentieth century. The fifteen countries in the sample are very different with regards to area, population and national output. For this reason, it is necessary to consider government revenue, expenditure and the volume of exports and imports as a percentage of national output. As all revenue, expenditure and trade data collected in Mitchell (2007a, 2007b, 2007c) is presented in nominal currency; it is not possible to use national income statistics from the Development Centre Studies World Economy Historical Statistics to calculate each as a percentage of national output. Instead, nominal national output data from The Economic History Association (2012) and Mitchell (2007a, 2007b, 2007c) are used.

The first method used to measure national output is Net National Product (NNP) or National Income (NI). After the Second World War, Gross National Product (GNP) and Gross Domestic Product (GDP) become more prevalent, especially in Western Europe. Mitchell

(2007a) states neither NNP, GNP nor GDP are intrinsically better than each other at measuring national output and while this scenario is not ideal, no measure can be considered incorrect. It is important to note different measures of national output are used at different times in the Mitchell statistics (See Appendix 5.4 for individual country accounts).

### 5.2.3 Nominal General Government Expenditure & Revenue

The management of public finances has been a fundamental statistic for all governments from a state's inception. It is surprising data on government revenue and expenditure, despite its importance historical, is only readily available for even the most developed countries from the middle of the nineteen century onwards (Mitchell, 2007a). With the exception of Britain and the Habsburg monarchy, almost no record of public finances is available for developed countries. Mitchell (2007a) suggests full information regarding the expenditure and revenue of most states only becomes widely available when democratically elected governments are present, wielding control over the taxation system. Furthermore, it must be recognised that in some instances countries failed to report expenditure and receipts for state secrecy reasons, military ambitions or reasons related to the repayment of national debt.

For the purposes of empirical tests in Chapter 6, data is collected for general government revenue only. Due to the balanced-budget approach adopted by many states prior to the Great Depression (Nasar, 2011), including both general government revenue and expenditure would lead to multicollinearity problems in the empirical tests presented in Chapter 6. Where possible general government statistics are used as opposed to central government figures. The latter includes central, regional and local levels but excludes federal levels which are included in 'general' government statistics (Flora, 1983). Due to a lack of data at general government level, in some instances central government figure are used between the years 1880 and 1919.

Fortunately, divergences between central and general government accounts only appear after 1945. The rationale for using general government revenue when measuring public finances, as opposed to general government expenditure, is simply down to the availability of data. Mitchell (2007a, 2007b, 2007c) provides all government figures revenue while Flora (1983), the European Commission (2012), the Australian Government, the Reserve Bank of Australia and US Government Revenue (2012) are used to construct an index of general government revenue for all fifteen countries. Due to the unexplained absence of data on government revenue in Mitchell (2007a) from 1994 onwards, data for the years 1994 to 2008 is sourced from the World Bank Databank.

### 5.2.4 Volume of Exports and Imports

Unlike nominal national output and public finances figures, data regarding external trade is more readily available for developed countries and dates back several centuries in many instances. This can be attributed to the importance of international trade as a source of government revenue, requiring all trade to be reported and recorded in national statistics. Historically, most European countries have reported the volume of exports and imports in two forms; the first is 'general trade'; the second 'special' trade. General trade refers to all commodities that enter or leave the borders of the state. Special trade describes only commodities that are imported for internal use or products that are produced in a state and then exported. The subtle difference is that general trade includes commodities that are imported and then used in the production of exports; special trade does not include these commodities. Trade data used in the empirical tests is reported in the form of 'special' trade.

Historical trade data is more credible than figures for the public finances, especially given the time period under examination. Smuggling, a problem rife in most developed countries due to

duties and taxes levied on exports and imports, only began to be eliminated in the mid-nineteenth century. Two decades of free trade in the middle of the nineteenth century rendered much smuggling activity redundant. The return to trade protectionism and tariffs on imported goods did return in the latter part of the nineteenth century, however at this stage monitoring at seaports and boarders was far more advanced, hence the incidence of smuggling collapsed (Mitchell, 2007a). It can be reasonably assumed trade data for today's developed states is accurate from the middle part of the nineteenth century onwards. For this purposes of this research nominal export data as a percentage of national output is calculated using Mitchell (2007a, 2007b, 2007c). Linear interpolation is used on a limited number of occasions to fill in missing data points between years. A discussion of the particulars for each country is outlined in Appendix 5.4.

### 5.2.5 Educational Enrolment Numbers at Primary School Level

According to Mitchell (2007a) of all the statistics reported for countries over the past two hundred and fifty years, from national output and industrial indices to crime levels, none presents less uniformity in reporting, both over time and across countries, than education. For this reason, comparisons in the importance of education, across countries are problematic. The reason for these inconsistencies relates to the arbitrary nature and definition of what comprises primary and secondary education. Large scale reorganisation of schooling systems across developed countries throughout the twentieth century make comparisons even more difficult. The statistics reported in Mitchell (2007a, 2007b, 2007c) face a further problem regarding the consistency of what is reported. The number of children reported in primary education can consist of any of the following; all those registered as attending school, all those that regularly attend school, all those present on a particular day when a register is taken or all those present on a particular day when an inspector visits. Despite these

drawbacks, estimates of child primary school participation rates are calculated as a percentage of the population aged between five and twelve years of age in education. Population data is obtained from Mitchell (2007a, 2007b, 2007c). A discussion of the particulars for each country and the number of times census figures are reported is outlined in Appendix 5.4.

### 5.2.6 Freight Traffic on Railway Lines

States, and by extension government, have for many years been involved in the development, provision and maintenance of transport and communication. Data on freight traffic is readily available for a large sample of developed countries dating to the early nineteenth century. Railway lines were a traditional source of military strength and for this reason governments have been keen to record and monitor all aspects of their use. With the exception of Germany and Japan, whose time series commence in the mid-1880s, freight traffic in million metric tons is recorded for all countries, from 1880 onwards. Freight traffic in million metric tons is now divided by population to establish the value of freight traffic per capita for each country. A discussion of the particulars for each country are reported is outlined in Appendix 5.4.

### 5.2.7 Democracy Index

The extent of democracy in a country is considered to be an important determinant of economic growth and institutional flexibility. Previous investigations into the relationship between economic growth and democracy have been discussed at length in Chapter 4. Table 4.3.1 presents various measurements used to quantify democracy. Measurement techniques ranging from simply binary choice (country is democratic or not) to more sophisticated measurement of democracy such as the Polity IV Database and the Freedom House Index. This research has chosen an alternative method to measure the extent of democracy by

collecting cross-country data on all those in the population above the legal voting age with a legal right to vote. Flora's (1983) *State, Economy, and Society in Western Europe* provides most of the earlier data (1880 to 1975), with International Institute for Democracy and Electoral Assistance (2012) database providing the later data from 1975 to 2008. Engermand & Sokoloff (2005) and The Princeton Encyclopaedia of American Political History (2010) are used to fill in missing data for New World countries between the years 1880 and 1948 which are not recorded in Flora (1983). All data from 1880 to 1980 is triangulated using Mackie (1983). The construction of the democracy measure from these three sources is now discussed.

The prevalence of voting rights among the population is used as a determinant of economic development (see Barro, 1998 and Rodrik, 2007) and institutional flexibility. As countries develop along a path to modernisation, voting rights have tended to become more apparent among the population. While voting rights today are almost universal in every developed country, this was not always the case. Restrictions on suffrage have historically been experienced by groups of the population such as females, younger citizens of the state, ethnic or religious minorities and those in lower social classifications. Restrictions have been imposed in the manner votes are cast, with plural voting often granted to those holding privileged positions within states. Universal voting rights have been further tarnished by violation of secret ballot and gerrymandering (the deliberate rigging of constituencies boundaries so as to fix an electoral outcome).

Data for the democracy index is collected from three sources mentioned above. Flora (1983) and Engermand & Sokoloff (2005) are used to construct the earlier part of the index. Both sources provide a variety of electoral data from 1820 to 1975 for the fifteen countries. Before

female suffrage in specific countries, the percentage of population above the voting age with a legal entitlement to vote consisted only of male members of the population above twenty years of age. While today voting rights are extended to those as young as sixteen in some cases, as late as 1968 no country in the sample extended franchise rights to persons below twenty years of age. In 1969 Sweden and the United Kingdom granted voting rights to nineteen year olds and above. These countries where subsequently followed by all others in reducing the legal voting age.

The latter part of the index is constructed using the *International Institute for Democracy and Electoral Assistance* (IIDEA) database. IIDEA is an intergovernmental organization, established in the early 1960s, with the purpose of supporting sustainable democracy worldwide. The organisation provides comparative knowledge to fledgling democracies, from experience of how others countries have become stable democracies. It assists these countries by encouraging and facilitating democratic reform by shaping policies and politics, enabling democracy to take root and become sustainable in newly democratic states. IIDEA provides data on voter turnout across over one hundred and fifty countries. This data contains additional information such as the year of each election, the number of votes cast, the percentage voter turnout, the number of registered people on the electorate list and the number of people in the population over eighteen years of age. Using the number of registered to vote and dividing it by the number of those in the population over eighteen, an estimate of the percentage of the population over eighteen with voting rights is calculated from all fifteen countries from 1975 to 2008. The estimates in Flora (1983) are cross checked with the IIDEA database from 1945 to 1975 and it can be confirmed that the estimates are almost identical. These are additionally cross referenced with the electoral turnout data in Mackie (1981) and further supported by this source. The fraction of the population above the

voting age which are legally entitled to vote is observed a minimum of twenty-nine times for all countries between 1880 and 2010. A discussion of the particulars for each country is outlined in Appendix 5.4.

### 5.2.8 Independence, Revolutions & Occupations

Chapter 3 explains Olson's (1982, 1989, 1996a & 1996b) argument regarding the importance of disruptions and stability on the progress of economic development across countries. Olson's work is grounded in what he regarded as the peculiar pattern of economic growth during the twentieth century, with the economic stagnation of the victorious countries starkly contrasted to the booming post-war economies of the defeated states, such as Germany and Japan. Olson (1965) discusses the damaging effects that group formation could have on a society and proposed four conditions necessary for group formation to occur; small numbers, common interests, stability and the passage of time. This logic is applied to countries to explain their performance over the twentieth century. Olson (1989) is convinced that the United Kingdom's relative poor economic performance during the twentieth century was a consequence of the destructive role of groups in British society or 'British disease'. Olson is not the first person to recognise this. Veblen (1915:132) suggests Britain is

> "Paying the penalty for having been thrown into the lead and so having shown the way".

Long before Veblen, Smith (1776:116) remarks

> "China seems to have long been stationary, and had, probably long ago acquired that full complement of riches which is consistent with the nature of its laws and institutions".

A series of disruption variables are included in the model to capture the affect disruption and institutional change has on the rate of economic growth over the period 1880 to 2008. The inspiration for this approach comes from Hodgson (1989 & 1996). A similar approach is taken, with the inclusion of three disruption variables used to capture national unification (DISNAT), foreign occupation (DISOCC) and revolution or civil war (DISREV). The same criteria used by Hodgson (1996) to define a disruption are used for these empirical tests. A period of disruption is only considered to be such if it obeys three criteria. Firstly, there must be an extensive foreign occupation, revolution or civil war, a year of the declaration of national independence or unification of the state, which leads to significant and noticeable social change. Secondly, there must be at least a decade from any other period of major disruption. Finally, it must occur in the 'modern era'. This is defined as the start of the period outlined by Black (1966) as marking the beginning of the period of "consolidation of modernising leadership" (CML) (See Tables 5.2.1 and 5.2.2). The inclusions of the second and third criteria are to prevent a bias by over-weighting disruptions that occur in close proximity to one another, with one possibly correlated to the other. Furthermore, this ensures disruptions that occurred before the modernisation of the state, which are too early to affect modern institutions, are not included.

Consolidation of modern leadership (CLM) is a transfer of power away from the traditional, hereditary base established by the ruling elite to that of modernising leaders who emerged from the educated middle classes. The creation of a state, a shift away from a predominantly agrarian way of life and a politically organised society with stable institutions are predominant features of countries that have consolidated modern leadership. As discussed in Chapter 2, CML marks the transition from a basic to mature autocratic state. Black (1966) argues CLM occurs when the state has a direct relationship with every citizen. This

relationship exists when centralised tax collection occurs and government expenditure extends to satisfy the needs of a country's education system. This is consistent with North, Wallis & Weingast 's (2009) description of the "mature nature state". Table 5.2.1 lists the years Black (1966) estimates as the beginning of CML in each country and the years when major disruptions ended. Table 5.2.2 presents a list of events that may have triggered the start of CLM in each country, providing a rationale for each of Black's commencement years for CLM. The dummy variables used to capture national independence (DISNAT), revolutions (DISREV) and foreign occupations (DISOCC) are illustrated in Appendices 5.1, 5.2 and 5.3.

**Table 5.2.1: Years of CLM and Major Disruption**

| **Country** | **CML** | **Periods of Major Disruption** | | | | | |
|---|---|---|---|---|---|---|---|
| Australia | 1801 | 1901 | | | | | |
| Austria | 1848 | 1848 | 1918 | 1945 | | | |
| Belgium | 1795 | 1813 | 1830 | 1848 | 1918 | 1945 | |
| Canada | 1791 | 1867 | | | | | |
| Denmark | 1807 | 1945 | | | | | |
| France | 1789 | 1789 | 1814 | 1830 | 1848 | 1871 | 1945 |
| Germany | 1803 | 1805 | 1848 | 1870 | 1918 | 1933 | 1945 |
| Italy | 1805 | 1805 | 1848 | 1860 | 1922 | 1945 | |
| Japan | 1868 | 1868 | 1945 | | | | |
| Netherlands | 1795 | 1795 | 1810 | 1945 | | | |
| Norway | 1809 | 1905 | 1945 | | | | |
| Sweden | 1809 | | | | | | |
| Switzerland | 1798 | 1803 | 1847 | | | | |
| United Kingdom | 1649 | 1688 | | | | | |
| United States | 1776 | 1783 | 1865 | | | | |

*Source*: Black (1966) and Hodgson (1996)

**Table 5.2.2: Event Triggering the Start of the CLM Period.**

| Country | CML | Event Triggering CML |
|---|---|---|
| Australia | 1801 | *Unknown* |
| Austria | 1848 | Hungary proclaims its independence from Austria. |
| Belgium | 1795 | Belgium becomes a part of France. |
| Canada | 1791 | Provinces Quebec and Ontario are formed each with an assembly. |
| Denmark | 1807 | The Second Battle or Bombardment of Copenhagen. |
| France | 1789 | The French Revolution. |
| Germany | 1803 | Territorial reform of German States. |
| Italy | 1805 | Napoleon declares himself the emperor of Italy. |
| Japan | 1868 | Restoration of imperial rule. |
| Netherlands | 1795 | The Velvet Revolution and establishment of the Batavian Republic. |
| Norway | 1809 | End of Dano-Swedish War |
| Sweden | 1809 | Sweden declares independence; Constitutional monarchy begins. |
| Switzerland | 1798 | Revolution in Switzerland |
| United Kingdom | 1649 | Cromwell's reign begins. |
| United States | 1776 | Declaration of Independence. |

*Source*: Timelines (2012)

### 5.2.9 Polity IV

The Polity IV project provides further institutional indicators. This database is used throughout the literature, most recently by Besley and Persson (2011), in an attempt to measure the effectiveness of institutions in sustaining and promoting economic growth. The Polity IV dataset covers a total of one hundred and sixty-four countries from the year 1800 to 2010. In order to be included in Polity IV, states must have a population of over 500,000 people in the year 2010. This database is unique as it examines concomitant qualities of democratic and autocratic authority in governing institutions, rather than discreet and mutually exclusive forms of governance (Marshall, Gurr & Jaggers, 2012). This advantage allows the variables in the database to be considered across countries and through time in the empirical tests presented in Chapter 6. Polity IV encompasses six component measures. Each measure records ‘executive recruitment’, ‘constraints on executive authority’ and ‘political

competition' across one hundred and sixty-four countries. Furthermore, the database considers and records changes in the institutionalized qualities of governing authorities.

According to Marshall, Gurr & Jaggers (2012:1) one drawback of using this data is that it only includes

> "…information on the institutions of the central government and on political groups acting, or reacting, within the scope of that authority. It does not include consideration of groups and territories that are actively removed from that authority or segments of the population that are not yet effectively politicized in relation to central state politics".

For the purposes of the empirical tests, this research considers two Polity IV variables; regime durability and political competition. Data is available for all countries in the sample from 1880 to 2010.

*5.2.9.1 Regime Durability*

Regime durability is measured as the number of years since the most recent regime change or the cessation of a transitional period, where standard institutions used to ensure the proper functioning of the state are not in place. Polity IV calculates the durable variable as the first year in which a new regime change occurs is given a baseline value of zero, with each subsequent year after this adding one to the initial value. Examples of events which are deemed to have reset the durability score to zero are the Liberal victory in the 1880 UK election, the German annexation of Austria in 1938 and the resignation of President Charles de Gaulle in 1969.

*5.2.9.2 Political Competition*

Political competition is measured by constructing an index based around two additional metrics of political competition. These are Regulation of Participation (PARREG) and Competitiveness of Participation (PARCOMP). PARREG measures the extent to which there are enforceable and compulsory rules on when, where and how political opinions and beliefs are articulated. A five point scale is constructed to categorise different levels of PARREG. The categories are Unregulated (1), Multiple Identity (2), Sectarian (3), Restricted (4) and Regulated (5). PARCOMP measures the extent to which alternative policies and leaderships can be pursued within a state. PARCOMP is also categorised on a five point scale. The categories are Repressed (1), Suppressed (2), Factional (3), Transitional (4) and Competitive (5). POLCOMP is constructed by combining both PARREG and PARCOMP and is presented in Table 5.2.3.

**Table 5.2.3: Translation of Polity IV Political Competition Concept**

| | **Polity IV Concept** | **Polity IV Component Variables** | |
|---|---|---|---|
| | **POLCOMP** | **PARREG** | **PARCOMP** |
| **1** | Suppressed | Restricted (4) | Repressed (1) |
| **2** | Restricted | Restricted (4) | Suppressed (2) |
| **3** | Imposed Transition: Loosening or Tightening restrictions | Sectarian (3) | Suppressed (2) |
| **4** | Uninstituionalised | Unregulated (1) | N/A |
| **5** | Gradual Transition from Uninstituionalised | Multiple Identity (2) | N/A |
| **6** | Factional/Restricted | Sectarian (3) | Factional (3) |
| **7** | Factional | Multiple Identity (2) | Factional (3) |
| **8** | Electoral Transition: Persistent Conflict/Coercion | Sectarian (3) | Transitional (4) |
| **9** | Electoral Transition: Limited Conflict/Coercion | Multiple Identity (2) | Transitional (4) |
| **10** | Institutionalised Electoral | Regulated (5) | Competitive (5) |

*Source: Marshall, Gurr & Jaggers (2012)*

To illustrate the ten point scale, Austria was at Point 6 from 1880 to 1920. From 1920 to 1932 it moves to Point 7, however in 1933 this declines to Point 1. Since the Second World War it

has remained at Point 10. Italy is at Point 6 in 1880 and remains there until 1928 when the establishment of the Mussolini regime coincides with a collapse of the POLCOMP to point 1. From 1948 to 2010 Italy is reports a POLCOMP score of 10.

### 5.2.10 Institutional Flexibility

The significance of disruption or stability in promoting or preventing economic growth leads to the inclusion of an institutional flexibility measure. In the absence of bifurcations and interruptions, which encourage the establishment of new institutions and practices, it is logical to believe that institutions display growth-retarding characteristics over time. Such growth-retarding characteristics are grounded in the Olsonian logic of institutional sclerosis. This logic is discussed in Chapter 3, however attempting to measure institutional change is more problematic. Previous attempts have been made notably by Choi (1983) who uses a rising logistic curve to reflect the 'sclerosis' that occurs due to stability, the passage of time and the selected interests of small groups. Choi (1983) uses the CLM date, proposed by Black (1966) in the formulation of the curve. This approach assumes that the societies begin with no sclerosis and no interest group interference.

As discussed in Section 3.4, Hodgson (1989) disputes the assumption of no prior sclerosis and suggests the curve which most closely resembles the form of institutional flexibility through time is more likely to be an inverted U-shape. The zenith of this curve represents the year institutions have the greater level of malleability and capacity, promoting and organising new ideas and routines (See Figure 3.3.1). Hodgson (1989) uses Black's years, selecting the starting years of EST as the high point in institutional flexibility for each country with institutional sclerosis setting in thereafter. Table 5.2.4 presents the year in which the fifteen countries commence EST and the event that may have triggered the initiation of this phase. In

addition, following the peak of the inverted U-shaped curve, institutional flexibility begins to decline as institutions, routines and habits become older and less receptive to change. In the absence of disruptive events, undermining the status quo and creating new institutions and routines, flexibility declines and the ossification of the system is the result.

**Table 5.2.4: Years of Economic and Social Transformation (EST)**

| Country | EST | Event Triggering EST |
|---|---|---|
| Australia | 1901 | Australian independence declared |
| Austria | 1918 | Austria is declared a republic |
| Belgium | 1848 | *Unknown* |
| Canada | 1867 | Foundation of Canada |
| Denmark | 1866 | *Unknown* |
| France | 1848 | Foundation of the Second Republic |
| Germany | 1871 | German unification |
| Italy | 1871 | Italian unification |
| Japan | 1945 | End of World War Two |
| Netherlands | 1848 | Parliamentary democracy established |
| Norway | 1905 | Norway becomes an independent kingdom |
| Sweden | 1905 | Union of Norway and Sweden dissolved |
| Switzerland | 1848 | Adoption of the Swiss federal constitution |
| United Kingdom | 1832 | Reform Act |
| United States | 1865 | End of civil war |

*Source*: Black (1966) and Hodgson (1996)

The approach taken to measure institutional flexibility in the empirical estimations in Chapter 6 builds on that of Choi (1983) and Hodgson (1989). Three approaches are used to measure institutional flexibility. The three are as follows:

1. Despite reservations (previously outlined) with the use of Black's EST year as the high point of institutional flexibility, the tests still consider the possibility this is correct. This approach is an extension of Hodgson (1989) and uses an inverted U-shape to capture the rise and decline of institutional flexibility in each country, with the peak of the curve corresponding to Black's year of EST. This measure is now referred to as FLX (See Figure 6.2.1).

2. A second approach is a new methodological approach to modelling institutional flexibility. A rising logistic curve, similar to that used by Choi (1983), is applied to the new democracy data collected and discussed in Chapter 5. From this application it is possible to identify the inflection point and corresponding year for each country. This year is assumed to correspond with a peak in EST where new ideas, the dissemination of new information and the absorbing new concepts and routines occurred most frequently. This year replaces that of Black (1966) in the inverted U-shape institutional flexibility curve and is known as DEMFLX. This is deemed a more appropriate approach as Black's date of EST is more likely to occur at the beginning of Hodgson's inverted U-shaped curve. EST is likely to trigger the start of a period of rapid institutional flexibility, leading to higher levels of economic growth, as narrow special-interest groups are destroyed during the transition from CML to EST (See Figure 6.2.2).
3. Thirdly, the first difference of each rising logistic curve is calculated and used as a measure of institutional flexibility. This transformation moves the measure of institutional flexibility away from the inverted U-shape for each county to varying degrees of rise and decline, depending upon the number of years it took for democracy to transition from low absolute levels to higher absolute levels. Countries that experienced rapid democratisation display a sharp rise and decline in institutional flexibility; countries which experienced slower transitions to full democracy display a more gradual rise and subsequent decline in institutional flexibility. This measure is now referred to as LOGCUR (See Figure 6.2.3).

Further explanation of these three approaches is provided in Section 5.3 of this chapter.

### 5.2.11 Global Era Dummies

Hodgson (1996) incorporates a number of dummy variables to test the hypothesis that different eras in the global economy affected individual countries in unique ways. Four periods are chosen to represent these dummies. These are 1880 to 1913 (pre First World War), 1919 to 1938 (Interwar period), 1946 to 1973 (post Second World War to the end of Bretton-Woods) and 1974 to 2008 (post Bretton-Woods).

### 5.2.12 Relative Productivity – Diffusion Hypothesis

Finally, a relative productivity measure is added to the model to capture Gomulka's (1971) "diffusion hypothesis". Gomulka (1971 & 1979) argues that the overriding factor which determines the rate of economic growth is the extent to which "diffusion of innovations" from the most technologically advanced countries in the world passes to less developed states. Like Gomulka (1971 & 1979) and Hodgson (1989) the rate of GDP per capita growth is used as a proxy for technological advancement. The effect 'diffusion' has on a country is dependent on the "absorptive capacity" of that state to embrace new technologies and routines (Hodgson, 1989) and is directly influenced by the level of education, institutional framework and a "variety of social, cultural, institutional and political factors" (Gomulka, 1979:186). This variable is included in the model and is simply the relative productivity levels between the United States of America (lead country) and each other country (RELPRO) from 1880 to 2008. This proxy captures the 'technology gap' between each country and the United States of America, which is deemed to be the most technologically advanced, measured by real GDP per capita. Data is obtained, as before, from The Development Centre Studies World Economy Historical Statistics. Real GDP per capita for each country is converted into a percentage of the United States level to give the variable RELPRO.

Having addressed the various empirical models employed in Chapter 6, Appendix 5.4 discusses the various idiosyncrasies associated with data availability and the construction of the independent variables, for the individual fifteen countries. Relative productivity with the US is available for all countries from 1880 to 2008.

## 5.3 EMPIRICAL MODELS

Three independent models of institutional flexibility are used in the empirical tests that follow in Chapter 6. To establish a measure of institutional flexibility, discussed in Section 5.2.10, a rising logistic curve is applied to the democracy data addressed in Section 5.2.7. An explanation of the logistic curve is now provided, followed by an explanation for the measurement of institutional flexibility. Finally, a description of the panel regressions run on all data discussed in Section 5.2 is presented. This section addresses specification tests to be used in Chapter 6 to confirm the model is correctly specified.

### 5.3.1. Logistic Curve

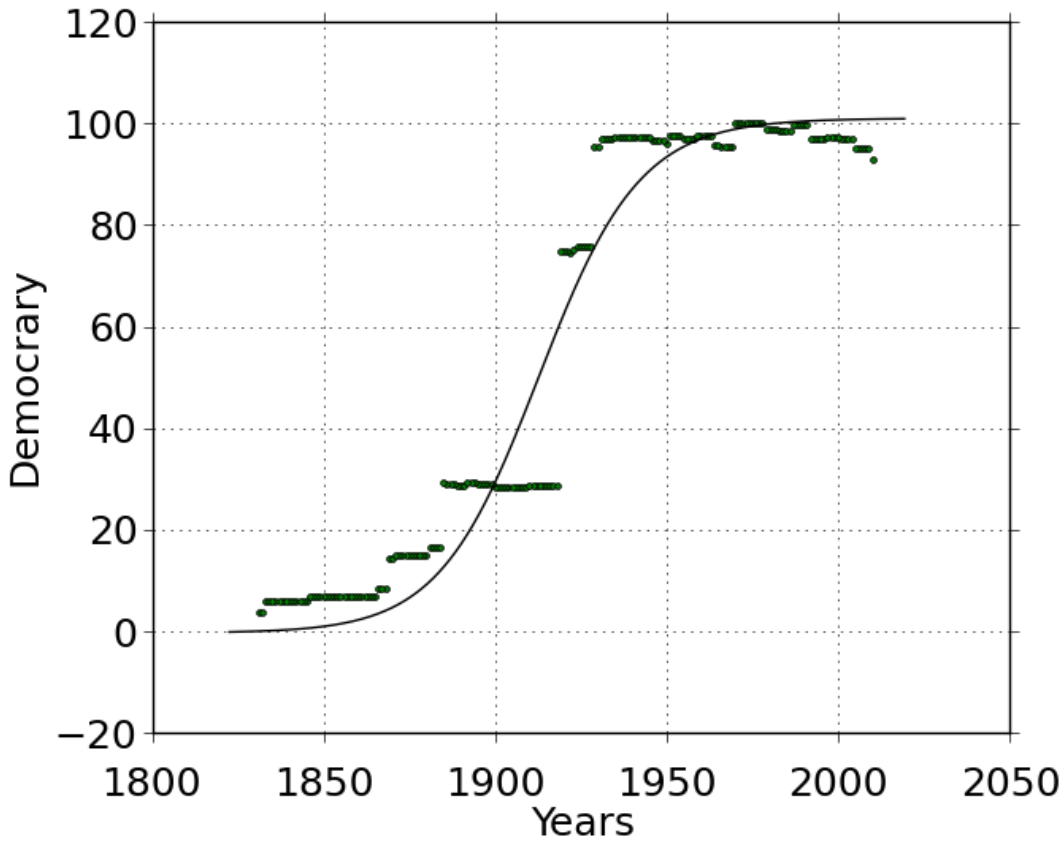
The logistic curve is a common sigmoid function used to obtain a smoothed-curve representation of a time-series. The functional form of the logistic curve used in the estimations presented in the Chapter 6 is presented in Equation 5.3.1.

$$y = \frac{a}{\left(1+\left(\frac{x}{b}\right)^{c}\right)} \qquad \textbf{(Equation 5.3.1)}$$

The use of this curve is most prevalent when attempting to explain the diffusion of an innovation through time. The conditions which led to the spread of democracy during the nineteenth century have been discussed in Chapter 4. From this discussion it should be clear the spread of democracy was very much the diffusion of a new idea which culminated in the bestowment of voting rights on the mass of the adult population across each state. The logistic curve is applied to each state from the earliest available democracy data point until 2008. This curve then allows a year of inflection to be identified. This year replaces Black's EST year as the high point of institutional flexibility in each country (See Equation 5.3.3). A

graphical illustration of the logistic curve, applied to democracy data for the United Kingdom, is presented in Figure 5.3.1. The year of inflection is identified as 1908.

**Figure 5.3.1: Democracy Logistic Curve for United Kingdom 1831 – 2008**




### 5.3.2. Three Measures of Institutional Flexibility

Section 5.2.10 introduces the three approaches used to measure institutional flexibility. As discussed in Section 5.2.10, two of the models assume institutional flexibility through time is shaped like an inverted U-shape. The peak of this curve representing the year institutions are assumed to have the greatest level of malleability and capacity, promoting and organising new ideas and routines. Following the peak, institutional flexibility starts to decline as institutions, routines and habits become older and less receptive to change. In the absence of disruptive events, which could undermine the status quo and create new institutions,

flexibility declines, inertia sets in and the ossification of the system is the result. The third approach moves away from the uniform inverted U-shape, allowing each country to display varying levels of rise and decline, depending on country specific conditions related to the spread of democracy in each. This section now discusses the functional form of three approaches considered below

1. FLX Years.
2. DEMFLX Years.
3. LOGCUR Years

The first approach is linked to approach number two which in turn is linked to approach number three. There is no direct relationship between approaches 1 and 3. This is a step forward in understanding the impact of institutional flexibility on economic growth. The use of the logistic curve to identify years that coincide with the peak of institutional flexibility is an innovative and logical step forward, breaking with the arbitrariness of other approaches, such as Black (1966), allowing for the identification of an inflection point and thus providing a rigorous approach to the identification of peak institutional flexibility years (DEMFLX Years).

*5.3.2.1 FLX Years*

This measure of institutional flexibility is discussed in section 5.2.10, and is calculated from 1880 to 2008 using the same model as Hodgson (1989). The Black (1966) EST years are used as the high point of institutional flexibility. The functional form used to model institutional flexibility is taken from Hodgson (1989) (See Equation 5.3.2):

$$FLX(t) = \frac{100}{\left[1 + 0.002(t - EST)^2\right]} \qquad \textbf{(Equation 5.3.2)}$$

Where: *FLX* measures institutional flexibility,

$t$ is the year,

*EST* is Black's year of economic and social transformation

*5.3.2.2 DEMFLX Years*

The second measure of institutional flexibility is generated by identifying the year of inflection in each countries logistic curve, discussed in Section 5.3.1. The same functional form used by Hodgson (1989) is employed with the EST year replaced by the year of inflection or DEMFLX dates (Equation 5.5.3):

$$DEMFLX(t) = \frac{100}{\left[1 + 0.002(t - DEMFLX)^2\right]} \qquad \textbf{(Equation 5.3.3)}$$

Where: *DEMFLX* measures institutional flexibility,

$t$ is the year,

*DEMFLX* is year the inflection point on the rising logistic curve.

*5.3.2.3 LOGCUR*

The third approach uses the first difference of each country's logistic curve (Equation 5.3.1). This approach moves away from the uniform hat shape used in approaches 1 and 2 but is related to the DEMFLX approach as institutional flexibility is measured by calculating the rate of change in the logistic curve in each year when applied to the democracy data. This allows the function to capture differences in countries experiencing rapid democratisation (steep curve) as opposed to those that experienced a much slower spread of democracy (flatter curve). The functional form capturing this approach is shown in Equation 5.3.4

$$LOGCUR(t) = (Logest_t) - (Logest_{t-1}) \qquad \textbf{(Equation 5.3.4)}$$

Where: *LOGCUR* measures institutional flexibility,

$t$ is the year,

*Logest*$_t$ is the logistic curve value of democracy in a given year $t$

### 5.3.3 Panel Regression Models

Chapter 6 presents regression results for the data discussed in Section 5.2 and the three separate approaches taken to model institutional flexibility in Section 5.3.2. Seven statements are presented in Section 6.3. Each seeks to explain if state development and institutional flexibility have a significant impact on long run growth. As this is a panel of data, both a fixed effects regression and random effects generalised least squares (GLS) regression are run. This section now discusses the difference in the fixed effects and random effects regressions, ensuring such an approach is appropriate, and explains the tests used to identify whether the fixed or random effects model is correct.

#### *5.3.3.1 Fixed Effects Model*

The Fixed Effects Model takes into account the individuality of each cross-sectional unit by allowing the intercept in each unit to vary but assumes a constant slope. This model is known as the Fixed Effects model because although the intercepts differ across different countries in the sample this difference is time invariant, or in other words, it is fixed through time as the slope coefficients are not allowed to vary. The Fixed Effects Model is presented as follows:

$$y_{i,t} = \alpha_i + \beta_1 X_{i,t} + u_{i,t} \qquad \textbf{(Equation 5.3.5)}$$

Where: $y_{it}$ is the dependent variable observed for individual country *i* at time *t*,

$\alpha_i$ is the time-invariant regressor

$X_{it}$ is the time-variant regressor

$u_{it}$ is the error term

*5.3.3.2 Random Effects Model*

The Random Effects Model differs from the Fixed Effects Model as it allows the country effects to vary. The Random Effects Model is used when it is believed some omitted variables are constant over time but differ between countries or may be constant between countries but variable over time. The model achieves this through the error term. Starting with the model presented in Equation 5.3.5, the intercept is assumed to be a random variable and can be expressed for each individual country as

$$\alpha_i = \alpha + \varepsilon_1 \qquad \textbf{(Equation 5.3.6)}$$

Where: $\varepsilon_1$ is a random error term with zero mean and constant variance.

This approach assumes all the countries in the sample under investigation have a common mean value of the intercept $\alpha$ and the individual differences in the intercepts for each country are reflected in the error term $\varepsilon_1$. Substituting this into the original model (Equation 5.3.5) gives the following:

$$y_{i,t} = \alpha + \beta_1 X_{i,t} + \varepsilon_i + u_{i,t} \qquad \textbf{(Equation 5.3.7)}$$

$$= \alpha + \beta_1 X_{i,t} + \varpi_{i,t} \qquad \textbf{(Equation 5.3.8)}$$

Where: $\varpi_{i,t}$ is the composite error terms consisting of two components, $\varepsilon_1$ which is the cross-section or individual specific error components and $u_{it}$ which is the combined time-series and cross-section error component. This transformation now allows random effects to be estimated as the intercept is no longer time-invariant.

*5.3.3.4 Variance Inflation Factors*

The tests presented in Chapter 6 use the Variance Inflation Factor (VIF) test to estimate how much the presence of multicollinearity has increased the variance of the estimated coefficients. The VIF test is captured by equation Equation 5.3.9 below:

$$VIF\left(\hat{\beta}_k\right) = \frac{1}{\left(1 - R_k^2\right)} \qquad \textbf{(Equation 5.3.9)}$$

Where: $R_k^2$ is the coefficient of determination from the original regression run in Chapter 6 which includes all independent variables.

The higher the VIF becomes the more severe the multicollinearity is considered to be. As a general rule, a VIF of greater than five assumes the presence of chronic multicollinearity.

*5.3.3.4 Breusch-Pagan Lagrangian Multiplier Test*

Once the empirical tests are conducted in Chapter 6, the Breusch-Pagan Lagrangian Multiplier Test is conducted to eliminate the possibility of incorrect estimators being used. The test is appropriate as it establishes whether a Random Effects GLS regression should be used over the simpler Ordinary Least Squares (OLS) regression. The null hypothesis in the Breusch-Pagan Lagrangian Multiplier Test test assumes the variance across countries is zero. In other words, panel effects do not exist. Should the null be rejected, it can be assumed

significant differences exist across countries in the sample and therefore an OLS regression is not appropriate.

#### *5.3.3.5 Hausman Test*

A Hausman Test is used to consider whether a fixed or random effects model is the most appropriate to use. The test is used to discover whether differences exist between the random and fixed effects models. The null hypothesis assumes the difference in coefficients is not systematic. Therefore, should one be unable to reject the null hypothesis, it is assumed no systematic difference exists between the fixed affects and random effects model. In this case, the random effects model should be used.

## 5.4 NEWLY CREATED DATASETS

A primary contribution of this chapter is not only to set the scene for the empirical tests that follow in Chapter 6 but also to illustrate the newly created datasets this research has put together. In total six new datasets have been created from manipulating and synthesising the data discussed in Section 5.2. It is hoped these datasets will be of use to others carrying out empirical investigations in the future. The six new datasets cover all fifteen countries in the sample from the years 1880 to 2008 in five year intervals (with expectation of years around both World Wars). The six new datasets are listed as follows:

1. Rate of GDP per Capita Growth.
2. General Government Revenue as Percentage of National Output.
3. Exports as Percentage of National Output.
4. Percentage of the Population above the Legal Voting Age with Voting Rights.
5. Traffic on State Railways in Metric Tons per Capita.
6. Relative Productivity with the United States of America.

These datasets are presented in Table 5.4.1 to 5.4.6 and graphically illustrated for each country in Appendix 5.5 to Appendix 5.10. Graphical representations of the application of the rising logistic curve to the democracy data are presented for each country in Appendix 5.11. With reference to the datasets the countries are coded as follows: AS = Australia, AU = Austria, BE = Belgium, CA = Canada, DE = Denmark, FR = France, GE = Germany, IT = Italy, JA = Japan, NE = Netherlands, NO = Norway, SW = Sweden, SZ = Switzerland, UK = United Kingdom and USA = United States of America.

**Table 5.4.1 Rate of GDP per Capita Growth**

| %ΔGDP | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 0.70 | 1.05 | 1.39 | 0.36 | 0.65 | -0.91 | -1.17 | 0.40 | 1.29 | 1.13 | -0.44 | 0.90 | -1.52 | 0.25 | 4.15 |
| 1880-1885 | 0.63 | 1.28 | 0.47 | 2.68 | 0.84 | 0.81 | 2.16 | 0.04 | -0.08 | 2.00 | 0.35 | 1.96 | 3.11 | 0.55 | 0.53 |
| 1885-1890 | 0.73 | 1.88 | 2.11 | 3.47 | 1.95 | 1.52 | 2.36 | 0.37 | 2.51 | -0.38 | 2.62 | 1.53 | 1.86 | 2.73 | 0.73 |
| 1890-1985 | -7.02 | 1.76 | 0.84 | -0.39 | 2.04 | 1.38 | 2.89 | -0.91 | 4.11 | 0.84 | 0.73 | 1.69 | 3.95 | 0.88 | 1.25 |
| 1895-1900 | 2.16 | 1.63 | 1.24 | 6.20 | 1.56 | 1.73 | 2.17 | 2.35 | 2.92 | 1.98 | 1.22 | 1.88 | 2.04 | 1.40 | 3.94 |
| 1900-1905 | 2.77 | 1.92 | 1.07 | 3.56 | 1.89 | 0.59 | 1.97 | 1.23 | -1.05 | 1.11 | -0.13 | 1.29 | 1.11 | 0.39 | 0.98 |
| 1905-1913 | 1.94 | 1.25 | 1.07 | 2.09 | 2.02 | 2.44 | 2.11 | 3.30 | 0.96 | 1.42 | 3.21 | 2.73 | 0.20 | 0.87 | 0.61 |
| 1919-1925 | 2.76 | 6.88 | 5.47 | 1.29 | 2.12 | 6.78 | 5.33 | 0.44 | 0.52 | 3.38 | 1.61 | 2.53 | 4.83 | 0.92 | 1.69 |
| 1925-1930 | -4.13 | 1.24 | 1.00 | 1.70 | 3.82 | 1.62 | 2.46 | -0.07 | -0.28 | 1.12 | 5.85 | 4.05 | 2.65 | 2.46 | -1.51 |
| 1930-1938 | 4.40 | 1.14 | -0.08 | 1.83 | 1.04 | 0.76 | 4.57 | 2.05 | 4.19 | 0.18 | 3.62 | 3.41 | 1.04 | 2.88 | 1.06 |
| 1946-1950 | 2.96 | 17.32 | 4.54 | 1.27 | 4.71 | 7.69 | 15.03 | 8.77 | 7.39 | 7.70 | 5.79 | 3.09 | 2.60 | 0.71 | 0.98 |
| 1950-1955 | 1.69 | 6.29 | 2.24 | 2.15 | 1.61 | 3.22 | 8.35 | 5.75 | 6.85 | 4.98 | 2.67 | 1.74 | 2.92 | 2.52 | 1.88 |
| 1955-1960 | 2.04 | 3.85 | 1.60 | 0.23 | 3.45 | 2.78 | 4.52 | 4.02 | 6.22 | 2.02 | 1.84 | 2.68 | 1.72 | 1.75 | 0.75 |
| 1960-1965 | 4.07 | 2.53 | 3.37 | 3.47 | 3.30 | 3.50 | 2.93 | 3.58 | 6.04 | 3.62 | 2.73 | 3.64 | 2.06 | 1.94 | 3.31 |
| 1965-1970 | 4.09 | 3.74 | 3.87 | 1.94 | 2.60 | 3.64 | 2.92 | 4.12 | 8.35 | 3.79 | 2.31 | 2.90 | 2.79 | 1.72 | 1.24 |
| 1970-1975 | 1.74 | 2.69 | 2.55 | 2.65 | 1.04 | 1.81 | 1.68 | 1.77 | 2.47 | 1.66 | 3.22 | 1.96 | -0.18 | 1.60 | 1.25 |
| 1975-1980 | 1.54 | 2.43 | 1.97 | 1.65 | 1.03 | 1.86 | 2.16 | 2.92 | 2.85 | 1.15 | 3.12 | 0.26 | 1.81 | 1.31 | 1.82 |
| 1980-1985 | 1.63 | 1.46 | 0.96 | 1.31 | 2.86 | 0.91 | 1.36 | 1.32 | 2.19 | 1.02 | 2.69 | 1.48 | 0.66 | 2.13 | 1.90 |
| 1985-1990 | 2.17 | 2.30 | 2.51 | 1.11 | 0.51 | 2.19 | 0.59 | 2.39 | 3.68 | 2.02 | 0.64 | 1.58 | 1.66 | 2.19 | 1.79 |
| 1990-1995 | 2.87 | 0.86 | 0.92 | 1.04 | 1.77 | 0.66 | 0.77 | 0.81 | 0.64 | 1.11 | 2.65 | 0.18 | -0.42 | 1.68 | 1.49 |
| 1995-2000 | 2.77 | 2.28 | 2.30 | 3.09 | 2.00 | 2.03 | 1.69 | 1.56 | 0.12 | 3.14 | 2.01 | 3.05 | 1.71 | 2.49 | 2.44 |
| 2000-2005 | 1.88 | 1.24 | 1.39 | 1.60 | 0.78 | 0.81 | 0.27 | 0.37 | 1.17 | 0.44 | 1.46 | 1.93 | 0.58 | 1.81 | 1.42 |
| 2005-2008 | 1.92 | 2.67 | 1.68 | 0.59 | -0.12 | 0.69 | 1.88 | 0.28 | 0.88 | 2.32 | 1.07 | 1.03 | 2.31 | 1.37 | 0.28 |

**Table 5.4.2 General Government Revenue as Percentage of National Output**

| GGR%GDP | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 1.70 | 8.25 | 6.60 | 4.90 | 5.83 | 11.64 | | | | | 4.72 | 4.82 | 2.74 | 6.32 | |
| 1880-1885 | 1.85 | 9.20 | 6.77 | | 7.70 | 11.39 | 4.00 | 18.70 | | 6.40 | 5.58 | 6.46 | 2.84 | 8.50 | |
| 1885-1890 | 2.12 | 9.82 | 7.58 | 4.79 | 8.50 | 11.61 | | | 10.98 | 6.30 | 6.31 | 8.60 | 3.20 | 7.40 | |
| 1890-1985 | 2.44 | 13.39 | 7.71 | | | 11.98 | 4.90 | 20.45 | 13.56 | 6.50 | 6.50 | | 3.20 | 7.80 | 7.00 |
| 1895-1900 | 2.80 | 18.33 | 8.82 | 5.14 | 8.60 | 11.55 | | 20.10 | 18.01 | 7.50 | 6.91 | 8.20 | 3.16 | 7.90 | |
| 1900-1905 | 3.29 | 18.76 | 7.75 | | 7.40 | 11.25 | 4.28 | | 17.26 | 8.30 | 7.74 | | 2.31 | 9.60 | |
| 1905-1913 | 2.85 | 20.62 | 8.65 | 5.52 | 7.75 | 10.37 | 4.20 | 18.20 | 37.00 | 7.90 | 8.20 | 8.65 | 6.50 | 8.80 | |
| 1919-1925 | 4.55 | 18.00 | 25.94 | 7.88 | 11.90 | 16.70 | 20.70 | 16.00 | 4.00 | 17.00 | 11.50 | 12.15 | | 22.55 | 8.40 |
| 1925-1930 | 4.43 | 19.07 | 19.47 | 7.36 | 13.75 | 20.00 | 24.40 | 14.80 | 31.89 | 16.00 | 16.40 | 10.80 | 13.80 | 21.80 | 19.10 |
| 1930-1938 | 5.57 | | 18.35 | 9.03 | 15.10 | 20.30 | 32.73 | 21.93 | 27.74 | 15.60 | 18.50 | 13.95 | 12.60 | 21.95 | 20.30 |
| 1946-1950 | 29.74 | | 21.64 | 19.36 | 23.10 | | 29.30 | 21.90 | 41.61 | | 32.30 | 20.67 | 15.95 | 42.35 | |
| 1950-1955 | 26.17 | | 21.35 | 17.78 | 24.50 | 26.70 | 32.84 | 20.76 | 42.67 | 32.80 | 34.62 | 27.98 | 16.84 | 36.54 | 30.20 |
| 1955-1960 | 23.50 | 26.12 | 22.95 | 16.01 | 29.88 | 27.62 | 29.50 | 22.90 | 31.26 | 27.63 | 34.35 | 32.00 | 17.38 | 34.30 | |
| 1960-1965 | 24.02 | 28.40 | 26.50 | 15.49 | 33.94 | 31.58 | 30.30 | 24.32 | 28.20 | 27.90 | 35.58 | 36.52 | 19.40 | 32.62 | |
| 1965-1970 | 20.60 | 31.36 | 32.68 | 35.67 | 42.48 | 42.05 | 31.87 | 24.80 | 22.50 | 33.08 | 35.54 | 40.84 | 25.54 | 41.22 | 30.65 |
| 1970-1975 | 20.63 | 32.60 | 40.16 | 37.14 | 46.03 | 52.86 | 41.96 | 30.60 | 21.34 | 45.27 | 32.84 | 41.38 | 48.90 | 42.05 | 30.96 |
| 1975-1980 | 22.49 | 46.76 | 45.41 | 37.14 | 47.60 | 44.41 | 44.49 | 33.68 | | 50.28 | | | | 41.36 | 31.31 |
| 1980-1985 | 24.08 | 49.48 | 47.51 | 39.81 | 51.77 | 47.60 | 43.84 | 36.72 | 30.11 | 52.93 | | | | 44.08 | 32.00 |
| 1985-1990 | 25.02 | 49.59 | 46.47 | 41.26 | 56.04 | 47.61 | 42.82 | 39.37 | 32.22 | 51.34 | 55.51 | | 30.19 | 40.69 | 32.83 |
| 1990-1995 | 22.47 | 50.93 | 46.83 | 43.56 | 55.42 | 48.25 | 44.83 | 44.41 | 31.74 | 50.79 | 53.98 | 59.56 | 31.70 | 38.15 | 33.61 |
| 1995-2000 | 24.43 | 51.11 | 49.03 | 44.30 | 56.36 | 50.49 | 45.94 | 45.84 | 30.99 | 46.44 | 54.60 | 59.17 | 33.81 | 39.17 | 34.93 |
| 2000-2005 | 25.46 | 49.58 | 49.63 | 41.29 | 55.89 | 49.83 | 43.97 | 44.06 | 31.00 | 44.40 | 56.46 | 55.01 | 34.59 | 39.71 | 32.51 |
| 2005-2008 | 25.22 | 47.80 | 48.58 | 40.49 | 55.68 | 50.13 | 43.81 | 45.67 | 34.52 | 46.07 | 58.18 | 54.46 | 34.34 | 41.82 | 33.58 |

**Table 5.4.3 Exports as Percentage of National Output**

| EXPRT%GDP | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 39.25 | 18.26 | 32.68 | 30.56 | 45.89 | 33.46 | 33.94 | 20.46 | 9.48 | 145.75 | 36.11 | 39.39 | 40.32 | 48.88 | 14.56 |
| 1880-1885 | 40.38 | 18.79 | 33.82 | 29.08 | 46.15 | 29.81 | 34.44 | 23.18 | 9.95 | 153.17 | 37.40 | 41.02 | 40.64 | 50.18 | 13.20 |
| 1885-1890 | 31.48 | 19.71 | 35.79 | 26.62 | 46.10 | 28.93 | 31.54 | 21.78 | 12.90 | 166.31 | 39.50 | 45.35 | 41.18 | 48.38 | 12.25 |
| 1890-1985 | 40.14 | 20.67 | 37.89 | 28.79 | 50.20 | 26.15 | 29.62 | 19.25 | 15.22 | 180.57 | 42.33 | 43.14 | 41.73 | 45.92 | 12.88 |
| 1895-1900 | 47.02 | 21.68 | 40.10 | 34.04 | 52.58 | 25.67 | 30.31 | 22.10 | 19.62 | 196.33 | 44.56 | 40.67 | 42.28 | 44.31 | 12.57 |
| 1900-1905 | 40.82 | 22.74 | 42.45 | 35.72 | 54.07 | 27.41 | 32.09 | 24.41 | 23.31 | 214.72 | 44.43 | 40.27 | 42.84 | 44.52 | 11.08 |
| 1905-1913 | 41.00 | 24.21 | 41.46 | 35.88 | 57.93 | 30.78 | 36.00 | 28.55 | 25.78 | 235.76 | 48.37 | 38.64 | 48.49 | 51.97 | 10.43 |
| 1919-1925 | 33.27 | 34.26 | 57.85 | 46.24 | 56.64 | 36.42 | 34.12 | 29.64 | 29.59 | 70.27 | 45.92 | 33.93 | 61.18 | 46.72 | 11.21 |
| 1925-1930 | 31.38 | 44.08 | 101.79 | 41.55 | 56.35 | 30.95 | 31.60 | 25.81 | 31.06 | 71.89 | 40.56 | 35.16 | 49.21 | 44.95 | 9.27 |
| 1930-1938 | 26.59 | 24.96 | 70.05 | 29.38 | 43.11 | 19.33 | 15.59 | 14.14 | 33.89 | 44.66 | 33.43 | 30.41 | 31.24 | 28.43 | 6.08 |
| 1946-1950 | 37.20 | 22.19 | 49.99 | 36.21 | 37.57 | 20.66 | 21.68 | 20.38 | 7.56 | 59.91 | 43.74 | 31.72 | 43.90 | 34.34 | 7.49 |
| 1950-1955 | 39.54 | 34.20 | 58.88 | 33.44 | 52.21 | 20.48 | 23.78 | 20.68 | 19.58 | 74.65 | 47.71 | 39.24 | 44.84 | 42.77 | 7.19 |
| 1955-1960 | 28.18 | 39.44 | 64.19 | 31.07 | 55.08 | 19.44 | 33.99 | 21.75 | 19.79 | 76.36 | 51.39 | 38.27 | 47.32 | 36.03 | 7.12 |
| 1960-1965 | 27.06 | 38.30 | 71.50 | 29.72 | 52.23 | 20.78 | 31.17 | 24.71 | 17.94 | 75.24 | 50.44 | 37.45 | 49.19 | 32.58 | 6.79 |
| 1965-1970 | 27.13 | 39.83 | 81.06 | 34.18 | 50.22 | 22.71 | 32.73 | 27.97 | 18.07 | 72.76 | 52.97 | 38.09 | 51.17 | 37.63 | 7.56 |
| 1970-1975 | 26.71 | 45.02 | 94.89 | 38.46 | 56.94 | 30.31 | 37.15 | 32.88 | 20.59 | 81.89 | 56.37 | 45.53 | 51.30 | 43.10 | 10.83 |
| 1975-1980 | 27.68 | 50.59 | 102.82 | 43.90 | 59.92 | 34.80 | 44.87 | 38.85 | 22.06 | 83.77 | 59.06 | 49.85 | 57.81 | 50.07 | 15.26 |
| 1980-1985 | 28.30 | 54.83 | 131.09 | 45.63 | 63.25 | 38.26 | 53.84 | 38.95 | 23.98 | 98.06 | 58.92 | 55.84 | 59.34 | 49.76 | 14.92 |
| 1985-1990 | 27.64 | 54.02 | 123.50 | 44.79 | 50.52 | 35.88 | 51.47 | 32.44 | 16.53 | 88.59 | 54.66 | 51.84 | 58.55 | 48.10 | 15.38 |
| 1990-1995 | 27.44 | 52.35 | 115.27 | 53.94 | 51.18 | 34.83 | 44.14 | 33.03 | 14.91 | 85.73 | 54.00 | 48.39 | 51.81 | 45.70 | 16.66 |
| 1995-2000 | 29.40 | 61.01 | 136.03 | 54.08 | 54.91 | 40.33 | 47.70 | 38.40 | 16.45 | 96.74 | 52.33 | 59.98 | 56.54 | 42.06 | 19.17 |

**Table 5.4.4 Percentage of the Population above Legal Voting Age with Voting Rights**

| POPVOTE | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 9.80 | 10.40 | 3.90 | 12.90 | 26.70 | 41.60 | 36.20 | 3.80 | | 5.40 | 8.30 | 10.70 | 38.35 | 16.40 | 18.30 |
| 1880-1885 | | 13.00 | 3.90 | 15.00 | 27.45 | 41.45 | 36.50 | 12.10 | | 5.40 | 10.40 | 10.80 | 38.35 | 20.73 | 18.30 |
| 1885-1890 | 10.20 | 12.95 | 3.90 | 15.00 | 28.85 | 41.80 | 37.35 | 14.65 | | 7.73 | 11.80 | 10.30 | 38.20 | 28.90 | 18.30 |
| 1890-1985 | | 12.90 | 20.60 | 15.00 | 29.40 | 41.80 | 37.80 | 14.20 | 1.66 | 11.40 | 14.50 | 10.70 | 38.20 | 29.10 | 18.30 |
| 1895-1900 | 44.38 | 13.80 | 37.70 | 15.00 | 30.00 | 42.00 | 37.80 | 12.00 | 1.66 | 20.90 | 25.70 | 11.15 | 38.10 | 28.50 | 18.40 |
| 1900-1905 | 64.73 | 14.20 | 37.70 | 15.00 | 29.05 | 43.20 | 38.30 | 13.50 | 3.16 | 22.80 | 34.40 | 13.35 | 37.65 | 28.50 | |
| 1905-1913 | 81.31 | 37.95 | 38.20 | 16.55 | 29.88 | 43.55 | 38.50 | 28.50 | 4.74 | 26.65 | 51.30 | 26.93 | 36.93 | 28.65 | |
| 1919-1925 | 82.96 | 88.67 | 44.83 | 20.50 | 80.80 | 41.65 | 97.40 | 50.97 | 9.60 | 67.27 | 87.15 | 69.70 | 40.27 | 75.00 | 25.10 |
| 1925-1930 | 82.96 | 91.25 | 45.35 | | 81.30 | 40.00 | 98.20 | 0 | 35.77 | 82.10 | 89.00 | 88.50 | 40.70 | 95.50 | 25.10 |
| 1930-1938 | 83.22 | 91.25 | 45.23 | 41.10 | 83.50 | 39.85 | 0 | 0 | | 84.05 | 91.80 | 89.55 | 41.90 | 97.20 | 37.80 |
| 1946-1950 | 86.93 | 89.10 | 76.13 | 94.10 | 87.60 | 88.60 | 95.60 | 96.50 | 94.15 | 89.60 | 93.60 | 96.30 | 43.70 | 96.30 | |
| 1950-1955 | 87.32 | 92.90 | 94.10 | 96.34 | 92.60 | 83.00 | 97.30 | 96.60 | 97.88 | 89.70 | 97.80 | 95.60 | 42.60 | 97.30 | |
| 1955-1960 | 86.13 | 94.65 | 93.90 | 92.02 | 93.15 | 88.05 | 97.50 | 98.70 | 95.91 | 90.90 | 97.30 | 95.40 | 40.80 | 97.50 | |
| 1960-1965 | 86.63 | 96.10 | 93.65 | 92.74 | 97.00 | 86.40 | 96.40 | 98.80 | 96.47 | 90.20 | 96.45 | 93.50 | 38.40 | 95.70 | |
| 1965-1970 | 89.53 | 97.55 | 92.80 | 90.33 | 98.46 | 85.85 | 93.80 | 98.90 | 99.68 | 93.60 | 99.00 | 96.40 | 38.20 | 97.65 | 67.06 |
| 1970-1975 | 87.89 | 97.65 | 94.30 | 91.37 | 98.17 | 87.50 | 98.80 | 99.40 | 100 | 97.35 | 99.40 | 96.30 | 82.15 | 100.00 | 67.44 |
| 1975-1980 | 88.91 | 91.72 | 93.55 | 91.61 | 98.06 | 88.51 | 92.40 | 100 | 100 | 98.03 | 95.51 | 96.14 | 84.48 | 98.77 | 67.62 |
| 1980-1985 | 87.62 | 90.13 | 96.24 | 90.36 | 97.80 | 90.20 | 90.86 | 100 | 99.50 | 98.52 | 99.94 | 96.43 | 83.39 | 98.47 | 68.14 |
| 1985-1990 | 87.89 | 90.77 | 92.62 | 90.77 | 97.53 | 88.47 | 91.49 | 100 | 100 | 97.70 | 98.02 | 96.19 | 84.04 | 99.66 | 66.88 |
| 1990-1995 | 87.14 | 91.71 | 91.54 | 91.71 | 97.00 | 88.91 | 91.67 | 100 | 98.86 | 95.49 | 98.18 | 95.14 | 85.28 | 96.82 | 68.94 |
| 1995-2000 | 86.00 | 87.24 | 91.80 | 87.24 | 96.72 | 88.08 | 91.63 | 100 | 99.20 | 95.76 | 98.01 | 95.48 | 80.86 | 97.10 | 71.64 |
| 2000-2005 | 88.05 | 90.77 | 93.80 | 90.77 | 96.49 | 78.34 | 92.80 | 100 | 98.76 | 97.02 | 98.11 | 97.41 | 82.40 | 95.99 | 79.93 |
| 2005-2008 | 86.93 | 89.97 | 99.48 | 89.97 | 96.08 | 72.40 | 91.27 | 98.24 | 100 | 95.38 | 97.87 | 97.97 | 82.41 | 92.84 | 86.75 |

**Table 5.4.5 Freight Traffic on State Railways in Metric Tons per Capita**

| FREIGHT | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 6.68 | 41.91 | 79.77 | 8.17 | 6.31 | 35.00 | | 10.01 | 0.00 | 21.73 | 5.68 | 10.04 | 22.56 | 93.77 | 1.41 |
| 1880-1885 | 12.66 | 267.28 | 112.38 | 57.91 | 5.58 | 372.04 | | 78.66 | 0.00 | 15.43 | 5.35 | 45.46 | 26.60 | 712.40 | 150.54 |
| 1885-1890 | | 308.42 | 120.09 | 71.94 | 6.55 | 359.76 | | 99.36 | 6.42 | 17.40 | 6.78 | 51.28 | 28.97 | 732.87 | 285.53 |
| 1890-1985 | 23.72 | 346.93 | 127.10 | 82.48 | 8.09 | 386.77 | 883.93 | 109.39 | 34.23 | 21.82 | 7.78 | 66.33 | 31.71 | 795.49 | 348.40 |
| 1895-1900 | 30.69 | 390.26 | 141.13 | 100.39 | 11.87 | 382.35 | 958.47 | 124.38 | 91.69 | 25.83 | 10.06 | 88.49 | 36.36 | 887.03 | 389.00 |
| 1900-1905 | 38.97 | 420.27 | 155.87 | 124.81 | 15.33 | 298.49 | 1125.71 | 119.67 | 154.29 | 31.05 | 15.09 | 108.91 | 34.42 | 990.44 | 515.71 |
| 1905-1913 | 45.49 | 450.36 | 188.92 | 168.06 | 19.47 | 355.99 | 1310.21 | 154.10 | 225.15 | 37.73 | 24.90 | 128.87 | 41.11 | 1110.17 | 1718.88 |
| 1919-1925 | 65.46 | 80.71 | 188.79 | 263.29 | 26.36 | 411.61 | 1689.95 | 183.76 | 436.85 | 33.66 | 28.73 | 109.46 | 43.42 | 666.78 | 1936.09 |
| 1925-1930 | 68.55 | 79.43 | 219.90 | 238.95 | 20.09 | 478.73 | 1178.74 | 210.81 | 554.13 | 39.22 | 31.13 | 102.15 | 41.16 | 563.22 | 1882.74 |
| 1930-1938 | 58.04 | 72.19 | 172.18 | 179.88 | 13.90 | 364.12 | 1268.19 | 155.09 | 538.14 | 33.04 | 22.45 | 72.14 | 36.26 | 482.24 | 1396.00 |
| 1946-1950 | 57.52 | 100.25 | 119.12 | 214.77 | 19.49 | 329.16 | 1051.26 | 150.57 | 843.77 | 33.02 | 22.70 | 70.01 | 27.66 | 404.71 | 1458.10 |
| 1950-1955 | 59.50 | 91.95 | 112.81 | 207.20 | 12.34 | 303.81 | 1148.87 | 141.43 | 786.14 | 36.26 | 25.68 | 63.45 | 27.84 | 389.22 | 1246.54 |
| 1955-1960 | 57.86 | 75.18 | 95.70 | 199.44 | 10.15 | 312.03 | 1038.55 | 119.56 | 645.88 | 32.73 | 24.91 | 57.48 | 29.79 | 318.56 | 1123.73 |
| 1960-1965 | 63.32 | 61.74 | 80.87 | 163.96 | 8.63 | 282.66 | 921.01 | 92.57 | 495.61 | 31.91 | 26.77 | 53.57 | 33.43 | 257.61 | 998.01 |
| 1965-1970 | 65.94 | 51.70 | 67.29 | 169.36 | 6.79 | 228.13 | 808.69 | 66.49 | 322.06 | 23.85 | 29.85 | 52.41 | 34.76 | 203.67 | 948.74 |
| 1970-1975 | 73.51 | 45.20 | 59.07 | 168.16 | 6.64 | 195.10 | 620.83 | 52.11 | 204.10 | 16.85 | 26.23 | 45.98 | 32.80 | 160.71 | 866.38 |
| 1975-1980 | 80.25 | 37.04 | 47.82 | 158.33 | 5.16 | 147.04 | 552.87 | 44.88 | 142.07 | 13.46 | 20.77 | 37.89 | 30.23 | 133.93 | 755.40 |
| 1980-1985 | 91.82 | 37.10 | 46.33 | 143.57 | 4.53 | 112.68 | 482.74 | 37.84 | 85.85 | 13.01 | 14.36 | 31.58 | 27.70 | 97.06 | 633.78 |
| 1985-1990 | 106.36 | 36.06 | 40.31 | 149.11 | 4.38 | 86.38 | 453.99 | 37.55 | 49.72 | 11.71 | 12.72 | 32.30 | 24.39 | 90.29 | 578.61 |
| 1990-1995 | 112.25 | 35.45 | 34.09 | 146.97 | 4.55 | 72.04 | 327.30 | 40.75 | 41.84 | 9.82 | 9.77 | 32.08 | 24.36 | 67.65 | 592.60 |
| 1995-2000 | | 34.70 | 31.41 | 146.01 | 3.89 | 74.15 | 222.14 | 43.30 | 38.49 | 11.49 | 8.36 | 28.99 | 26.28 | 73.78 | 761.06 |
| 2000-2005 | | 42.68 | | | 3.25 | | 211.60 | 43.74 | | 12.55 | | 26.30 | 27.60 | | 770.92 |

**Table 5.4.6 Relative Productivity with the United States of America**

| RELPRO | AS | AU | BE | CA | DE | FR | GE | IT | JA | NE | NO | SW | SZ | UK | USA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1875-1880 | 100.00 | 65.29 | 96.26 | 57.03 | 68.51 | 66.60 | 62.55 | 49.65 | 27.12 | 95.65 | 47.65 | 47.74 | 76.94 | 100.00 | 100.00 |
| 1880-1885 | 100.00 | 67.75 | 95.96 | 63.39 | 69.55 | 67.50 | 67.78 | 48.44 | 26.30 | 100.00 | 47.23 | 51.22 | 87.31 | 100.00 | 100.00 |
| 1885-1890 | 100.00 | 72.04 | 100.00 | 70.12 | 74.39 | 70.05 | 71.58 | 49.16 | 29.83 | 97.97 | 50.40 | 52.15 | 93.80 | 100.00 | 100.00 |
| 1890-1985 | 95.69 | 73.75 | 96.36 | 65.06 | 76.02 | 70.50 | 73.71 | 43.67 | 30.83 | 91.50 | 48.37 | 53.87 | 95.71 | 100.00 | 100.00 |
| 1895-1900 | 98.11 | 70.45 | 91.21 | 71.17 | 73.74 | 70.30 | 72.96 | 43.64 | 28.83 | 83.69 | 45.88 | 54.00 | 93.70 | 100.00 | 100.00 |
| 1900-1905 | 92.24 | 66.56 | 83.62 | 76.73 | 72.08 | 62.34 | 66.87 | 42.75 | 24.92 | 77.43 | 40.76 | 50.97 | 84.29 | 97.38 | 100.00 |
| 1905-1913 | 97.28 | 65.38 | 79.60 | 83.89 | 73.80 | 65.74 | 68.82 | 48.36 | 26.16 | 76.38 | 46.16 | 57.97 | 80.48 | 92.83 | 100.00 |
| 1919-1925 | 88.39 | 53.59 | 74.26 | 69.09 | 69.69 | 66.32 | 56.22 | 46.49 | 30.01 | 80.08 | 45.57 | 54.34 | 85.76 | 81.89 | 100.00 |
| 1925-1930 | 75.78 | 57.72 | 80.14 | 77.43 | 85.97 | 72.94 | 63.96 | 46.96 | 29.78 | 90.18 | 58.38 | 69.31 | 100.00 | 87.58 | 100.00 |
| 1930-1938 | 96.08 | 58.10 | 78.88 | 74.20 | 94.06 | 72.90 | 81.51 | 54.13 | 39.98 | 85.69 | 69.57 | 87.67 | 100.00 | 102.28 | 100.00 |
| 1946-1950 | 77.52 | 38.76 | 57.13 | 76.26 | 72.62 | 54.24 | 40.59 | 36.63 | 20.09 | 62.71 | 56.79 | 70.80 | 94.80 | 72.58 | 100.00 |
| 1950-1955 | 73.67 | 46.37 | 57.63 | 75.26 | 67.87 | 56.89 | 53.20 | 42.91 | 25.43 | 67.23 | 57.83 | 68.63 | 99.72 | 72.21 | 100.00 |
| 1955-1960 | 77.60 | 57.54 | 61.37 | 77.26 | 77.78 | 65.30 | 68.02 | 52.22 | 35.19 | 73.15 | 63.59 | 77.61 | 100.00 | 76.31 | 100.00 |
| 1960-1965 | 75.65 | 57.64 | 63.79 | 78.05 | 81.63 | 68.30 | 68.45 | 56.63 | 44.22 | 73.02 | 64.76 | 82.31 | 100.00 | 72.67 | 100.00 |
| 1965-1970 | 80.00 | 64.85 | 70.60 | 80.18 | 84.40 | 75.92 | 72.12 | 64.66 | 64.63 | 79.62 | 66.72 | 86.57 | 100.00 | 71.64 | 100.00 |
| 1970-1975 | 80.88 | 71.52 | 76.40 | 87.92 | 83.65 | 79.57 | 73.94 | 65.97 | 69.66 | 82.13 | 75.36 | 89.51 | 100.00 | 72.75 | 100.00 |
| 1975-1980 | 77.58 | 74.06 | 77.88 | 87.07 | 81.97 | 79.48 | 75.97 | 70.78 | 72.28 | 79.15 | 81.15 | 80.83 | 100.00 | 69.61 | 100.00 |
| 1980-1985 | 75.48 | 71.21 | 72.29 | 84.87 | 83.91 | 74.96 | 73.08 | 68.04 | 74.00 | 73.77 | 83.60 | 77.47 | 94.54 | 68.37 | 100.00 |
| 1985-1990 | 74.02 | 72.82 | 74.12 | 81.34 | 79.53 | 76.06 | 68.66 | 70.31 | 80.99 | 74.40 | 79.59 | 76.64 | 92.62 | 70.82 | 100.00 |
| 1990-1995 | 77.23 | 73.36 | 74.26 | 78.15 | 82.71 | 74.58 | 70.31 | 69.97 | 81.21 | 75.23 | 88.21 | 71.50 | 83.76 | 71.38 | 100.00 |
| 1995-2000 | 76.34 | 72.69 | 72.56 | 79.00 | 80.71 | 71.74 | 66.55 | 65.95 | 72.85 | 77.85 | 88.18 | 72.75 | 78.95 | 71.50 | 100.00 |
| 2000-2005 | 78.72 | 72.64 | 72.98 | 80.28 | 78.65 | 70.65 | 63.70 | 63.71 | 72.10 | 75.22 | 89.82 | 75.41 | 76.31 | 73.87 | 100.00 |
| 2005-2008 | 81.15 | 77.40 | 75.87 | 81.04 | 78.97 | 71.28 | 66.72 | 63.86 | 73.18 | 79.21 | 91.41 | 78.29 | 80.52 | 76.15 | 100.00 |

## 5.5 CONCLUSION

Chapter 5 attempts to address four central points. Firstly, what data has been sourced and how has it been shaped to use it in the empirical tests that follow. Secondly, what empirical models are to be used to test the data collected. Thirdly, what countries-specific conditions exist that determine the availability and usability of the collected data. And finally, what data has now been created so that it can be used by others in this area into the future.

It should be clear that a large portion of the data that is used in Chapter 6 has been constructed by manipulating data already available and bringing together datasets covering different periods in time, in order to have an extended timeframe for examination. Data has been obtained from a variety of contemporary and historical sources such The Australian Government (2012), Black (1966), The Economic History Association (2012), Engerman & Sokoloff (2005), The European Commission (2012) Flora (1983), Hodgson (2006), International Institute for Democracy and Electoral Assistance (2012), Maddisson (2006), Mitchell (2007), Mackie (1982), Marshall, Gurr & Jaggers (2012), The Princeton Encyclopaedia of American Political History (2010), The Reserve Bank of Australia (2012), US Government Revenue (2012), The United States Government Revenue History (2012) and The World Bank (2012).

Each source has been used to create useable panels of data for the fifteen countries examined from 1880 to 2008 for the list of variables discussed in section 5.2. Section 5.3 is presented to allow the reader understand the foundation of econometric tests that follow in Chapter 6. A derivation of the logistic curve, applied to the level of democracy in each country, is explained. An explanation of the measures of institutional flexibility, central to Chapter 6, is provided in this section. The three different approaches followed are all tested in the Chapter

6 and are a step forward in understanding the relationship between institutional flexibility and economic growth. Due to the extended timeframe under examination it should not be surprising that in some instances data is missing or proxy data must be used. This is due to the very different circumstances each country endured from 1880 to 2008, which include two world wars, a great depression, two major oil crises not to mention internal revolutions, external occupations and in some cases nearly fifty democratic elections. These individual country-specific conditions are discussed in Appendix 5.4. Section 5.5 presents the newly created data. In total six new datasets are presented. Each of these is a step forward in understanding cross-country conditions since 1880 under various different institutional indicators.

# CHAPTER 6 - EMPIRICAL RESULTS

## 6.1 INTRODUCTION

The statistical tests presented in this chapter are applied to the fifteen countries discussed in Chapters 2, 3 and 5, using the data collected and created. The availability of historical data, which in most instances is available only for the countries considered in the regressions, prevented a larger sample of states being examined. This test attempts to build on the work started by Black (1966), Olson (1982), Choi (1983) and Hodgson (1989 & 1996) and by considering an extended period of time, allowing for institutional flexibility, institutional ossification, internal upheaval and the sclerotic effects of the passage of time in stable democratic societies to be taken into consideration.

A major contribution of the work is the derivation of a measure of institutional flexibility which extends the analysis of both Choi (1983) and Hodgson (1989). As alluded to in Chapter 5, Choi (1983) argues the sclerotic effects, central to Olson's rise and decline hypothesis, can be plotted using a rising logistic curve. The timing of each country's logistic curve corresponds to the starting year of Black's (1966) Consolidation of Model Leadership (CML) for each state. Hodgson (1989) suggests choosing Black's (1966) date for Economic and Social Transformation (EST) is a better approximation of a countries economic, social and political transformation from which to measure institutional sclerosis. Furthermore, Hodgson (1989) believes a logistic curve is not the most appropriate shape to model Olson's rise and decline hypothesis. Such a curve gives no credit to the period before institutional sclerosis sets in, when the ability for fostering new ideas, disseminating new information and absorbing new concepts and routines is at its highest. Once this period reaches its zenith, decline ensues, in line with Olson's rise and decline hypothesis. This is due to inertia, an

ossification of the system and the reinforcement of existing routines and societal norms. The longer the passage of time in a stable, democratic society the more ossified the system becomes. In the absence of major conflict or upheaval, it is logical to assume a decline in institutional flexibility continues apace. Only in the face of major disruption, forcing institutional change and the creation of new routines and institutions, are cycles of decline disrupted. Assuming this logic is correct, Hodgson (1989) suggests Choi's logistic curve would more accurately reflect Olson's concept of institutional sclerosis if it were modelling as an inverted U, the peak of the curve corresponding to the year established by Black (1966) as marking the starting point for each country's EST. Chapter 3 explains the problem of using Black's EST year as marking the high point of institutional flexibility. This research offers three approaches for measuring institutional flexibility, discussed in Section 5.4. To refresh these are as follows:

1. FLX – Black's EST year is used as the high point of institutional flexibility. This approach is an extension of Hodgson (1989) and uses an inverted U-shape to capture the rise and decline of institutional flexibility in each country, with the peak of the curve corresponding to Black's starting year of EST.
2. DEMFLX – The application of a rising logistic curve to the new democracy data to identify the inflection point and corresponding year for each country. This year is assumed to correspond with a peak in EST and replaces Black's (1966) year in the inverted U-shape institutional flexibility curve.
3. LOGCUR – The first difference of each rising logistic curve is calculated and used as a measure of institutional flexibility.

This chapter continues are follows: Section 6.2 graphically compares the appropriateness of using Black's EST date as the high point of institutional flexibility with the alternative logistic curve approaches. Section 6.3 presents the panel regressions run on the fifteen countries for all three measures of institutional flexibility. Section 6.4 provides a discussion of the findings of the empirical results. Section 6.5 concludes the chapter.

## 6.2 THE PEAK OF INSTITUTIONAL FLEXIBILITY

Due to the arbitrary nature of the EST years selected by Black (1966) a more robust and consistent approach is required to model institutional flexibility. Olson's theoretical framework is central to this approach. As discussed in Chapter 3, Olson (1982) outlines the rise and decline of countries in accordance with his concept of institutional sclerosis. Following this logic, institutional flexibility should decline when narrow special-interest groups start to form in stable democratic societies. As Black's years of EST represent the commencement of economic and social transformation, as opposed to marking the high point, they are therefore likely to lead to an improvement in institutional flexibility. Therefore, it is deemed inappropriate to use these years to mark the high point of institutional flexibility. Two alternative approaches to modelling institutional flexibility are forwarded as alternative and are discussed in Section 6.1.

### 6.2.1 Comparing FLX, DEMFLX & LOGCUR

Table 6.2.1 presents the fifteen countries used in the empirical tests and possible years when institutional flexibility peaked. The second column presents the original years suggested by Black's (1966) for the commencement of EST while the fourth column lists the years when EST is assumed to have ended. The third column presents a new set of years reflecting the peak of institutional flexibility in each country. These years have been identified by applying the logistic curve to the democracy data discussed in Section 5.5.1 and are the DEMFLX Years. The benefit of this approach is twofold. Firstly, it provides a set of years that have been rigorously identified and consistently defined. Secondly, it establishes a list of years where the rate of economic and social transformation is deemed to have peaked; reflecting the high watermark of institutional flexibility in each country. Of further significance, is the divergence between the peak DEMFLX years and the arbitrary years selected by Black

(1966) for both the commencement and conclusion of EST. While many of the new peak years sit between Black's start and end dates, notable exceptions standing out include Australia, Austria, Japan, Norway, Sweden and Switzerland. It is likely the first five experienced economic and social transformation much earlier than Black (1966) suggests. Conversely, Switzerland's economic and social transformation peak is likely to have occurred much later than suggested by Black.

**Table 6.2.1: Economic and Social Transformation & Logistic Curve Years**

| | **Black (1966) Commencement of EST** | **Logistic Curve Inflection Year** | **Black (1966) End of EST** |
|---|---|---|---|
| Australia | 1901 | 1900 | 1941 |
| Austria | 1918 | 1910 | |
| Belgium | 1848 | 1927 | 1948 |
| Canada | 1867 | 1927 | 1947 |
| Denmark | 1866 | 1912 | 1945 |
| France | 1848 | 1906 | 1945 |
| Germany | 1873 | 1909 | 1933 |
| Italy | 1871 | 1943 | |
| Japan | 1945 | 1933 | |
| Netherlands | 1848 | 1916 | 1948 |
| Norway | 1905 | 1908 | 1945 |
| Sweden | 1905 | 1905 | 1945 |
| Switzerland | 1848 | 1933 | 1932 |
| UK | 1832 | 1908 | 1945 |
| USA | 1865 | 1907 | 1933 |

*Column 2 & 4 Source:* Black (1966)

From Table 6.2.1 it appears Black's selected years for the commencement of EST, which Hodgson (1989) uses to reflect the high point of institutional flexibility, are in need to revision. The mean date to reflect the zenith of institutional flexibility suggested by Hodgson (1989) is 1876. The logistic curve approach used in this research suggests a much later year. Using the new approach, this research suggests the high point of economic and social transformation more likely occurred on average just after World War I. Having established a

set of new years for the zenith of institutional flexibility, this list of years (column 3 in Table 6.2.1) now measures institutional flexibility and is referred to as DEMFLX. Graphical illustrations of Equations 5.2.2 and 5.2.3, applied separately to each of the fifteen countries, are presented in Figures 6.2.1 and 6.2.2.

Figure 6.2.1 uses the original Black years (column 2 in Table 6.2.1) to plot each institutional flexibility curve (FLX). Five countries (Australia, Austria, Japan, Norway and Sweden) experience a peak in institutional flexibility during the period 1880 to 2008, with the remaining ten all peaking prior to 1880. While there appears to be only eleven countries plotted, the remaining four follow identical institutional flexibility curves and are hidden. For example, Norway does not appear on Figure 6.2.1 simply because it follows an identical pattern to Sweden, peaking in 1913. Similarly, France, Germany and the Netherlands are hidden behind Switzerland and follow an identical pattern, with each state's peak occurring in 1848, the year Black (1966) selects are the commencement of the phase of EST. Figure 6.2.2, uses the DEMFLX estimator of institutional flexibility. All fifteen countries experience a peak in institutional flexibility between the years 1880 and 2008. Similar to Figure 6.2.1, not all countries appear to have been plotted. This is the case again because Sweden and Norway follow an identical curve, as do Italy and Japan, and Belgium and France.

**Figure 6.2.1: Cross-Country Institutional Flexibility FLX Years**

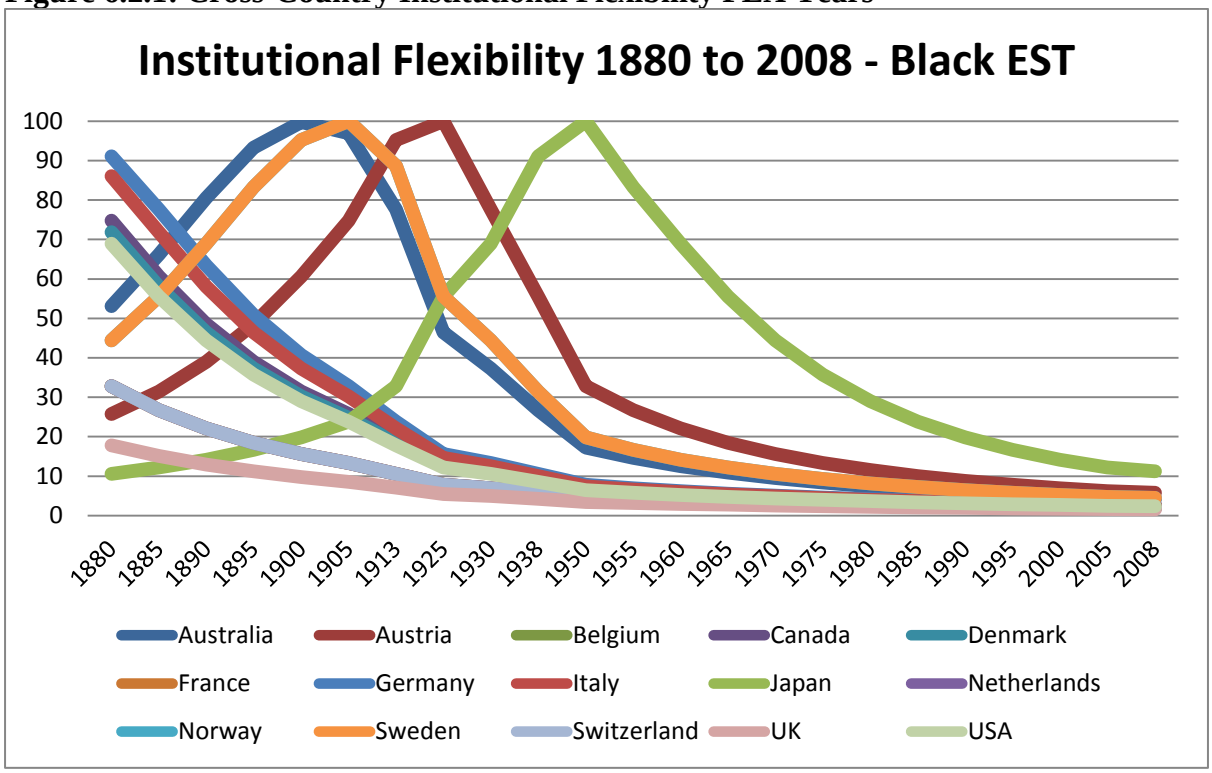
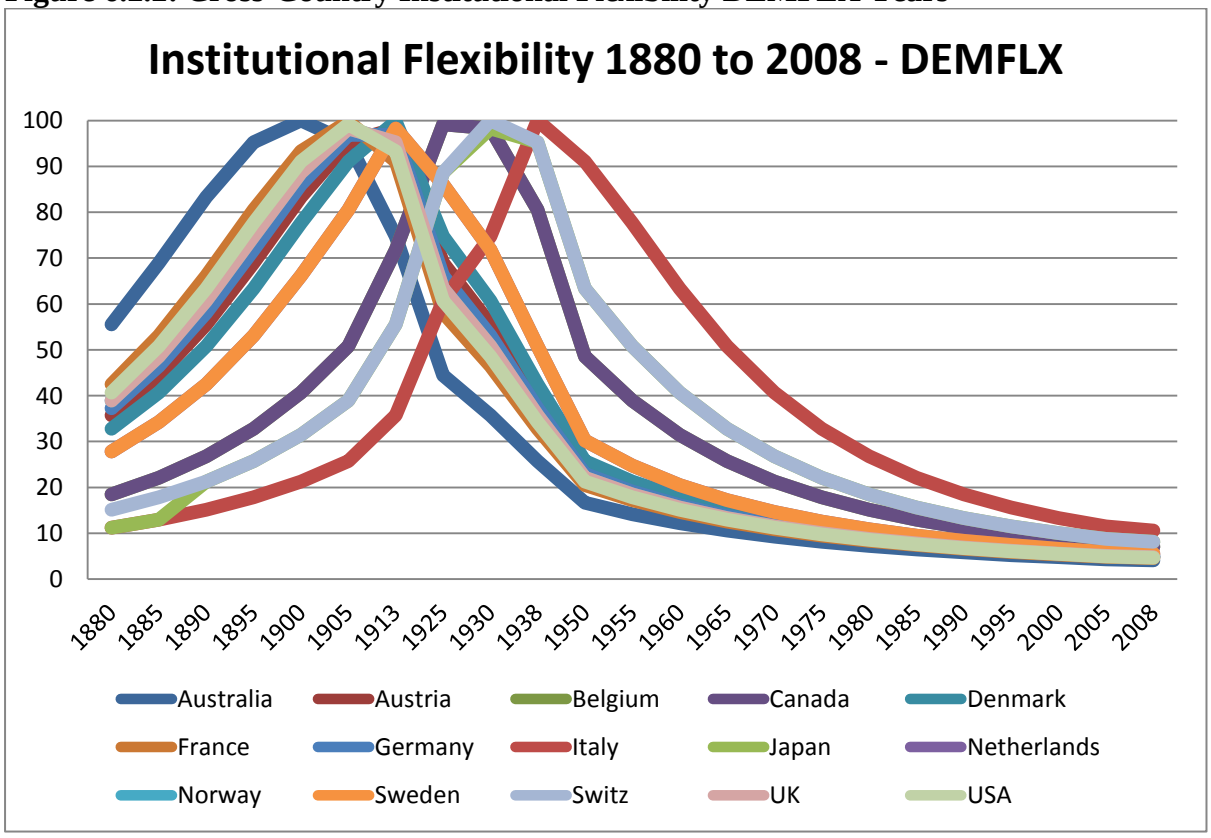



**Figure 6.2.2: Cross-Country Institutional Flexibility DEMFLX Years**



The third approach, (the first difference of each logistic curve) as a measure of institutional flexibility is illustrated in Figure 6.2.3. This differs from both the FLX and DEMFLX as the rate of rise on decline is dependent upon the number of years it takes for democracy to move from low absolute levels to higher absolute levels. The y-axis is a measure of institutional flexibility.

**Figure 6.2.3: Cross-Country Institutional Flexibility LOGCUR**

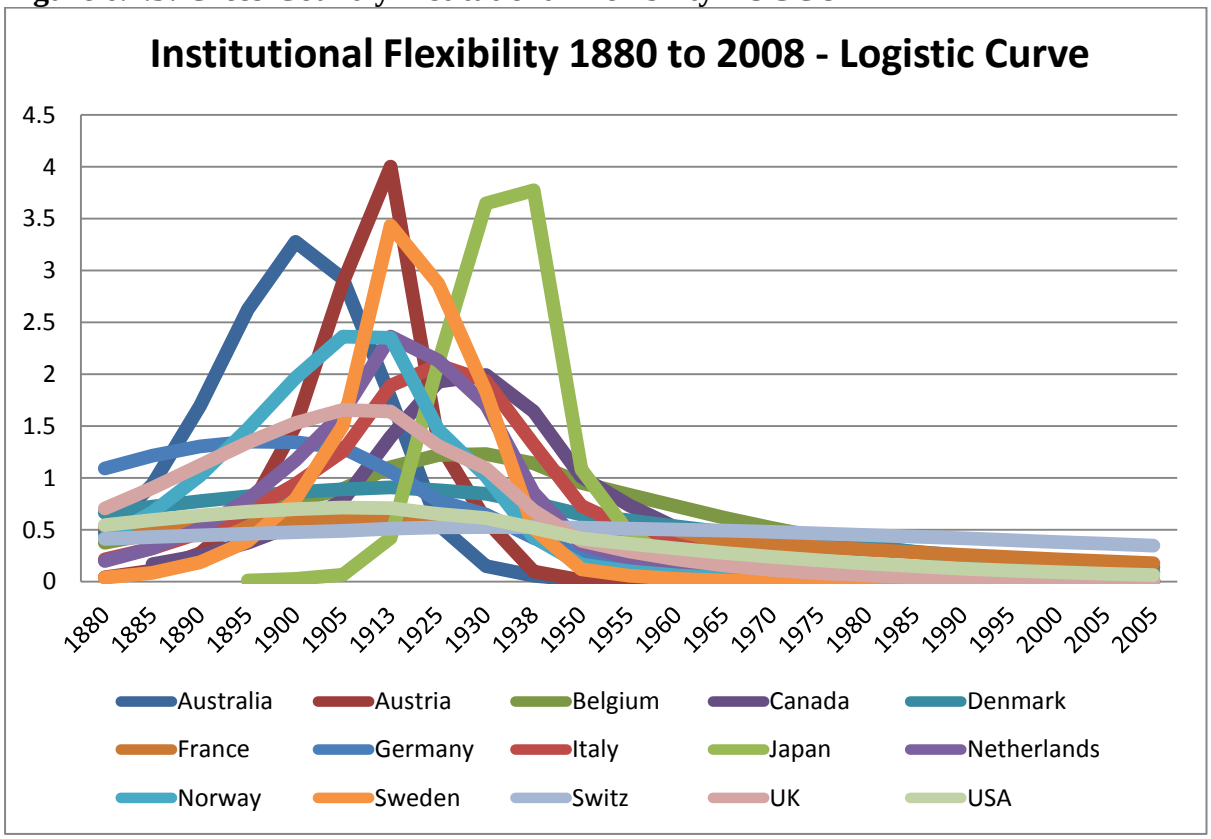



Figure 6.2.3 illustrates while some countries experienced a dramatic rise and decline in institutional flexibility, others experienced far less fluctuation. In order to establish if any of these measures of institutional flexibility are appropriate, a series of panel regressions are carried out. These regressions are now presented in Section 6.3.

## 6.3 RESEARCH STATEMENTS & PANEL REGRESSION RESULTS

Using the data collected and created, it has been decided to test seven various statements in the empirical study from 1880 to 2008. The seven are now listed with the assumption each can explain the rate of GDP per capita growth across the fifteen countries under examination.

1. The capacity of the state to raise revenue, engage in external trade, educate the child population and sustain commercial freight traffic on railways.
2. The capacity of the state to extend enfranchisement among the adult population.
3. The degree of institutional disruption captured by DISNAT, DISREV and DISOCC.
4. The degree of institutional flexibility measured using three alternative approaches FLX, DEMFLX and LOGCUR.
5. Political competition and regime durability as measured by the Polity IV dataset.
6. Different global conditions in given eras, reflecting the influence of world effective demand, global financial markets and international conflicts.
7. The technology gap between the United States and all other countries measured using RELPRO.

A series of generalised least squares regressions are run for selected five intervals between 1880 and 2008.[9] The selected intervals are 1880 – 1885, 1885 – 1890, 1890 – 1895, 1895 – 1900, 1900 – 1905, 1905 – 1913, 1919 – 1925, 1925 – 1930, 1930 – 1938, 1946 – 1950, 1950 – 1955, 1955 – 1960, 1960 – 1965, 1965 – 1970, 1970 – 1975, 1975 – 1980, 1980 – 1985, 1985 – 1990, 1990 – 1995, 1995 – 2000, 2000 – 2005 and 2005 – 2008. This produces an empirical analysis of fifteen countries over a total of one hundred and twenty-eight years with

[9] Please note due to World War I and World War II some periods are long than five year intervals due to international conflicts. These periods are 1906 to 1913 (eight years), 1919 to 1925 (seven years) and 1931 to 1938 (8 years). The last period, 2005 to 2008 covers four years.

two hundred and fifty-two observations. The rate of GDP per capita growth, measured using Maddison's OECD dataset, is the dependent variable and is subject to a series of regressions.

For the purposes of these tests, sixteen independent variables and one of the three measures of institutional flexibility are run against the dependent variable, the rate of GDP per capita growth. General government revenue as a percentage of national output, the value of exports as a percentage of national output, the percentage of the population aged between five and twelve years of age enrolled in primary education, freight traffic in million metric tons per capita, the percentage of the population above the voting age with voting rights (POPVOTE) and the rate of change in POPVOTE are included to capture the role of the state in promoting and sustaining long term economic growth, the significance of which has been explained in Chapter 2. Additionally, national unification (DISNAT), foreign occupation (DISOCC), revolution or civil wars (DISREV), regime durability and political competition (POLCOMP) are included as independent variables. These consider if Olson's disruption and stability hypothesis impact upon the rate of economic growth. A number of global era dummies for the periods 1880 to 1913 (pre First World War – ERA 1), 1919 to 1938 (Interwar period – ERA 2), 1946 to 1973 (post Second World War to First Oil Crisis – ERA 3) and 1974 to 2008 (post Bretton-Woods – ERA 4) are included, as is a measure of relative productivity (RELPRO). The former tests if extended and defined periods of time can explain economic growth across countries, while the later tests the diffusion hypothesis (See Section 5.2.12). Finally, institutional flexibility, which is central to Olson's "rise and decline" hypothesis, is measured in three ways, already discussed; FLX Years, DEMFLX Years and LOGCUR.

The empirical tests are now presented in three sub sections; 6.3.1, 6.3.2 and 6.3.3 for each of the institutional flexibility measures. In all three subsections both fixed and random effects

models are presented. All tests are corrected for heteroscedasticity, with robust standard errors produced and presented. Both the Breusch-Pagan Lagrangian Multiplier Test and Hausman Test are presented to confirm the correct model specification. In all three sets of sets of regressions the random effects model proves to be the correct model specification.

### 6.3.1 Empirical Results – FLX Years of Institutional Flexibility

The first set of estimations presented uses the FLX Years to correspondent with the zenith of institutional flexibility. Tables 6.3.1 and 6.3.2 presents both fixed and random effects regressions. Due to presence of multicollinearity, general government revenue as a percentage of national output, the value of exports as a percentage of national output, the percentage of the population aged between five and twelve years of age enrolled in primary education, political competition (POLCOMP), global era dummies for periods 1880 to 1913 (ERA 1) and 1974 to 2008 (ERA 4) and the measure of relative productivity (RELPRO) are dropped from the tests. While it is often difficult to explain why some independent variables are dropped over others, the reason for dropping these seven is as follows. Statement 1 in Section 6.3 combines elements of state development such as the ability of the state to raise revenue, engage in external trade, educate the child population and sustain commercial freight traffic on railways. These four variables are correlated. Government revenue as a percentage of national output and the percentage of the population aged between five and twelve years of age in education are dropped due to the incidence of missing observations (See Table 5.4.2 for the former). Freight traffic on railways is chosen over export data as the latter accounts for only "special trade" as opposed to general trade (See section 5.2.4). POLCOMP is dropped as it is highly correlated with DURABLE, with the latter thought to capture the Olson's theoretical framework more appropriately. ERA 1 and RELPRO are correlated with POPVOTE; the latter is considered central to this thesis hence both ERA 1

and RELPRO are dropped from the regression analysis. ERA 4 is automatically dropped from the regressions as the control dummy variable.

Removing these seven independent variables leaves ten remaining variables to be tested on the dependent variable. Furthermore, the variance inflation factor test for mulitcollinearity reports a VIF coefficient of 2.09. It can be assumed that no mulitcollinearity problems exist. A Breusch-Pagan Lagrangian Multiplier Test is run and reports a coefficient of 0.067. The null hypothesis assumes that the individual effects are zero. The null is rejected, confirming the existence of random effects and use of the correct model. A Hausman Test is conducted, comparing the fixed effects and random effects models. The test reports a coefficient of 0.9598. The null hypothesis assumes no difference between the two models and therefore the null hypothesis cannot be rejected. It can be assumed there is no systematic difference between the random effects and fixed effects models. The random effects GLS is assumed to be the most appropriate technique to use in this panel analysis and is selected as the best estimator. The full VIF, Breusch-Pagan Lagrangian Multiplier Test and Hausman Test are presented in Appendices 6.3.1, 6.3.2 and 6.3.3. Tables 6.3.1 and 6.3.2 illustrate the results when the FLX measure of institutional flexibility is included in the model. Despite the fact the Hausman Test confirms the random effects model is the most appropriate model, the fixed effect regression is still presented. The discussion which now follows only considers the random effects GLS regression results (Table 6.3.2).

**Table 6.3.1 Fixed Effects (within) Regression (FLX Years)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.2195
F (4, 264) = 12.72
Prob > F = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 0.6991 | 0.4721 | 1.48 | 0.140 | -0.2311 | 1.6293 |
| ERA 2 | -0.6588 | 0.3439 | -1.92 | 0.057* | -1.3364 | -0.0188 |
| ERA 3 | 1.7576 | 0.2404 | 7.31 | 0.000**** | 1.2838 | 2.2313 |
| DURABLE | -0.0068 | 0.0039 | -1.73 | 0.086* | -0.0145 | 0.0095 |
| DISNAT | 1.6103 | 0.5380 | 2.99 | 0.003*** | 0.5503 | 2.6703 |
| DISOCC | 0.3063 | 0.3173 | 0.97 | 0.335 | -0.3188 | 0.9314 |
| DISREV | 0.5071 | 0.4609 | 1.10 | 0.272 | -0.4012 | 1.4154 |
| FREIGHT | 0.0004 | 0.0008 | 0.05 | 0.962 | -0.0154 | 0.0162 |
| VOTECHG | 1.0675 | 1.4098 | 0.76 | 0.450 | -1.7104 | 3.8454 |
| FLX | 0.0070 | 0.0052 | 1.33 | 0.184 | 0.0033 | 0.0172 |
| CONSTANT | 0.2849 | 0.6025 | 0.47 | 0.637 | -0.9022 | 1.4720 |
| Sigma_u | 0.0109 | | | | | |
| Sigma_e | 0.0129 | | | | | |
| rho | 0.4176 (fraction of variance due to u_i) | | | | | |

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
FLX = Measure of institutional flexibility using Black (1966) EST Years

**Table 6.3.2 Random Effects GLS Regression (FLX Years)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.3763
Wald $chi^2$ = 108.75
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 1.0930 | 0.3855 | 2.84 | 0.005*** | -0.5295 | 1.7773 |
| ERA 2 | -0.6732 | 0.3358 | -2.00 | 0.045** | -1.5119 | -0.1733 |
| ERA 3 | 1.8160 | 0.2534 | 7.17 | 0.000**** | 1.2808 | 2.1670 |
| DURABLE | -0.0055 | 0.0029 | -1.91 | 0.056* | -0.0117 | 0.0034 |
| DISNAT | 0.2652 | 0.2568 | 1.03 | 0.302 | -0.2359 | 2.5872 |
| DISOCC | 0.0143 | 0.1283 | 0.11 | 0.911 | -0.2689 | 1.1101 |
| DISREV | 0.0225 | 0.0758 | 0.30 | 0.766 | -0.1272 | 1.2786 |
| FREIGHT | 0.0068 | 0.0053 | 1.23 | 0.218 | -0.0039 | 0.0156 |
| VOTECHG | 0.9540 | 1.4464 | 0.66 | 0.510 | -1.9887 | 3.5010 |
| FLX | 0.0063 | 0.0055 | 1.13 | 0.258 | 0.0004 | 0.0160 |
| CONSTANT | 0.8540 | 0.3892 | 2.87 | 0.004*** | -0.0048 | 1.7127 |

Sigma_u | 0.0034
Sigma_e | 0.0129
rho | 0.0652 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
FLX = Measure of institutional flexibility using Black (1966) EST Years

The regression results presented in Table 6.3.2 indicated four of the ten independent variables are significant at the 10% level of better. POPVOTE is positively related to rate of GDP per capita growth. Democracy therefore, is found to be growth-promoting in the long run and highly significant. As expected, ERA 3, a golden era for economic development, reports a significant negative coefficient. On the other hand, ERA 2 not surprisingly reports a significant negative coefficient. This is to be expected given it covers the period of time during the Wall Street Crash and Great Depression. Olson's hypothesis is supported by the significant negative coefficient reported for regime or government durability. However DISNAT, DISREV nor DISOCC are statistically significant. The same can be said for FREIGHT, VOTCHG and FLX. The latter result confirms the Black EST years are not an appropriate peak for modelling an inverted U-shaped institutional flexibility function, when attempting to explain rate of GDP per capita growth. An $R^2$ of .3763 is reported. Considering the extended timeframe under examination this is not a surprising result and is deemed acceptable. Further discussion of these finding is presented in Section 6.4.

### 6.3.2 Empirical Results - DEMFLX Years of Institutional Flexibility

An identical panel regression is run but the original measure of institutional flexibility (FLX Years) is replaced with that corresponding to DEMFLX Years. As before, the regressions are run on selected intervals between 1880 and 2008. The selected intervals are 1880 – 1885, 1885 – 1890, 1890 – 1895, 1895 – 1900, 1900 – 1905, 1905 – 1913, 1919 – 1925, 1925 – 1930, 1930 – 1938, 1946 – 1950, 1950 – 1955, 1955 – 1960, 1960 – 1965, 1965 – 1970, 1970 – 1975, 1975 – 1980, 1980 – 1985, 1985 – 1990, 1990 – 1995, 1995 – 2000, 2000 – 2005 and 2005 – 2008. This produces an empirical analysis of fifteen countries over a total of one hundred and twenty-eight years with two hundred and fifty-two observations. Tables 6.3.3 and 6.3.4 present the results of these regressions for both fixed and random effects models.

Again, due to multicollinearity problems, general government revenue as a percentage of national output, the value of exports as a percentage of national output, the percentage of the population aged between five and twelve years of age enrolled in primary education, political competition (POLCOMP), global era dummies for periods the 1880 to 1913 (ERA 1) and 1974 to 2008 (ERA 4) and the measure of relative productivity (RELPRO) are all dropped from the tests. The logical for dropping these variables has been outlined in Section 6.3.1. Removing these seven independent variables leaves the same remaining ten independent variables to be tested on the dependent variable. The variance inflation factor test for mulitcollinearity reports a VIF coefficient of 2.21. As before it can now be assumed that no mulitcollinearity exists.

To ensure the correct estimator is employed, a Breusch-Pagan Lagrangian Multiplier Test is run, reporting a coefficient of 0.016. The null hypothesis, that the individual effects are zero, is strongly rejected, confirming the existence of random effects. The Hausman Test reports a coefficient of 0.7769. The null hypothesis cannot be rejected and it can be assumed there is no systematic difference between the random effects and fixed effects models. The random effects GLS is again chosen as the most appropriate technique to use. The full VIF, Breusch-Pagan Lagrangian Multiplier Test and Hausman Test are presented in Appendices 6.3.4, 6.3.5 6.3.6. Tables 6.3.3 and 6.3.4 report the results when the DEMFLX Years are used to model institutional flexibility. Again, both the fixed effect and random effects regression are presented, with the discussion focusing only on the random effects results (Table 6.3.4).

The regression results presented in Table 6.3.4 are similar to those presented in Table 6.3.2. The replacement of the FLX Years with the new DEMFLX Years is worthwhile as the latter is significant at the 5% level. The reported positive coefficient confirms that as institutional

flexibility increases, the rate of GDP per capita growth increases; as flexibility declines, the reasons of which have been discussed in Chapter 3, the rate of GDP per capita growth declines. Furthermore, in order to establish if the shape of the institutional flexibility suggested by Hodgson (1989) is appropriate, a range of different curves are tested. This research confirms the Hodgson (1989) approach (see Equation 5.5.3) is the most appropriate as it has the highest level of explanatory power. The DEMFLX years are a step forward in establishing the peak of institutional flexibility during this phase of economic and social transformation and are a significant contribution to the existing literature. The explanatory power of the GLS regression presented in Table 6.3.4, while not a massive improvement on the panel regression presented in Table 6.3.2, is still higher at 0.4039. Again, given the extended time under examination, the reported $R^2$ of is not unexpected and deemed satisfactory.

**Table 6.3.3 Fixed Effects (within) Regression (DEMFLX Years)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.2392
F (4, 264) = 13.11
Prob > F = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 0.8534 | 0.4689 | 1.82 | 0.070* | -0.0706 | 1.7773 |
| ERA 2 | -0.8278 | 0.3322 | -2.49 | 0.013** | -1.4824 | -0.1733 |
| ERA 3 | 1.7065 | 0.2352 | 7.25 | 0.000**** | 1.2430 | 2.1670 |
| DURABLE | -0.0051 | 0.0043 | -1.19 | 0.235 | -0.0137 | 0.0034 |
| DISNAT | 1.5048 | 0.5493 | 2.74 | 0.007*** | 0.4224 | 2.5872 |
| DISOCC | 0.4361 | 0.3421 | 1.27 | 0.204 | -0.2380 | 1.1101 |
| DISREV | 0.3571 | 0.4677 | 0.76 | 0.446 | -0.5644 | 1.2786 |
| FREIGHT | 0.0098 | 0.0074 | 0.13 | 0.894 | -0.0136 | 0.0156 |
| VOTECHG | 0.8410 | 0.01350 | 0.62 | 0.534 | -1.8187 | 3.5010 |
| DEMFLX | 0.0099 | 0.0042 | 2.35 | 0.020** | 0.0002 | 0.0182 |
| CONSTANT | 0.0317 | 0.5849 | 0.05 | 0.957 | -1.1208 | 1.1842 |

| | |
|---|---|
| Sigma_u | 0.0102 |
| Sigma_e | 0.0128 |
| rho | 0.3890 (fraction of variance due to u_i) |

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
DEMFLX = Measure of institutional flexibility using logistic curve years

**Table 6.3.4 Random Effects GLS Regression (DEMFLX Years)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.4039
Wald $chi^2$ = 111.40
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 1.2964 | 0.3913 | 3.31 | 0.001**** | -0.5295 | 1.7773 |
| ERA 2 | -0.8687 | 0.3282 | -2.65 | 0.008*** | -1.5119 | -0.1733 |
| ERA 3 | 1.7576 | 0.2433 | 7.22 | 0.000**** | 1.2808 | 2.1670 |
| DURABLE | -0.0055 | 0.0032 | -1.70 | 0.089* | -0.0117 | 0.0034 |
| DISNAT | 0.3123 | 0.2797 | 1.12 | 0.264 | -0.2359 | 2.5872 |
| DISOCC | -0.0043 | 0.1350 | -0.03 | 0.974 | -0.2689 | 1.1101 |
| DISREV | 0.0371 | 0.0838 | 0.44 | 0.658 | -0.1272 | 1.2786 |
| FREIGHT | 0.0067 | 0.0054 | 1.24 | 0.217 | -0.0039 | 0.0156 |
| VOTECHG | 0.6906 | 1.3670 | 0.51 | 0.6113 | -1.9887 | 3.5010 |
| DEMFLX | 0.0082 | 0.0040 | 2.07 | 0.020** | 0.0004 | 0.0160 |
| CONSTANT | 0.8540 | 0.4381 | 1.95 | 0.051* | -0.0048 | 1.7127 |

Sigma_u | 0.0040
Sigma_e | 0.0128
rho | 0.0900 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
DEMFLX = Measure of institutional flexibility using logistic curve years

### 6.3.3 Empirical Results – LOGCUR Institutional Flexibility

The third set of regressions is run on the same panel of data. Institutional flexibility is measured using the first difference of each logistic curve. This transformation moves the measure of institutional flexibility away from the uniform inverted U-shape for each county (see Figure 6.2.3). Countries that experienced rapid democratisation display a sharp rise and decline in institutional flexibility. As before the regressions are run on selected intervals between 1880 and 2008. This produces an empirical analysis of fifteen countries over a total of one hundred and twenty-eight years, with two hundred and fifty-two observations. The results of both the fixed and random effects models are presented in Tables 6.3.5 and 6.3.6. As before, multicollinearity problems arise, resulting in the dropping of the same seven independent variables. The same logic for dropping the variables applies (See Section 6.3.1).

The variance inflation factor test for mulitcollinearity now reports a VIF coefficient of 2.11. The same specification tests are conducted to ensure the correct estimator is employed. The Breusch-Pagan Lagrangian Multiplier Test reports a coefficient of 0.028. The null hypothesis, that the individual effects are zero, is strongly rejected, confirming the existence of random effects. The Hausman Test reports a coefficient of 0.8870. The null hypothesis cannot be rejected and it can be assumed that there is no systematic difference between the random effects and fixed effects models, with the former chosen as the most appropriate technique. The VIF, Breusch-Pagan Lagrangian Multiplier Test and Hausman Test are presented in Appendices 6.3.7, 6.3.8 and 6.3.9. Focusing on the random effects regression, the results appear similar to what has been found in the two previous approaches. The logistic curve measure of institutional flexibility is not statistically significant. The DEMFLX inverted U-shaped function is deemed to have greater explanatory power when explaining the impact of institutional flexibility on the rate of GDP per capita growth.

**Table 6.3.5 Fixed Effects (within) Regression (LOGCUR)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.2369
F (4, 264) = 12.74
Prob > F = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 0.5251 | 0.4424 | 1.19 | 0.237 | -0.3467 | 1.3969 |
| ERA 2 | -0.6966 | 0.3234 | -2.15 | 0.032** | -1.3338 | -0.0594 |
| ERA 3 | 1.7196 | 0.2405 | 7.15 | 0.000**** | 1.2457 | 2.1936 |
| DURABLE | -0.0084 | 0.0041 | -2.05 | 0.042** | -0.0165 | -0.0003 |
| DISNAT | 1.4019 | 0.5272 | 2.66 | 0.008*** | 0.3630 | 2.4408 |
| DISOCC | 0.1620 | 0.3201 | 0.51 | 0.613 | -0.4688 | 0.7928 |
| DISREV | 0.4510 | 0.4525 | 1.00 | 0.320 | -0.4406 | 1.3426 |
| FREIGHT | 0.0004 | 0.0080 | 0.01 | 0.995 | -0.0158 | 0.0159 |
| VOTECHG | 1.3804 | 1.4424 | 0.96 | 0.340 | -1.4617 | 4.2226 |
| LOGCUR | -0.0832 | 0.1178 | -0.71 | 0.481 | 0.3153 | 0.1490 |
| CONSTANT | 0.9199 | 0.5223 | 1.76 | 0.080* | -0.1093 | 1.9490 |

Sigma_u | 0.1000
Sigma_e | 0.0129
rho | 0.3749 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
LOGCUR = First difference of logistic curve

**Table 6.3.6 Random Effects GLS Regression (LOGCUR)**

Number of Observations = 252
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.3708
Wald $chi^2$ = 108.82
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| POPVOTE | 0.8422 | 0.3424 | 2.46 | 0.014** | -0.5295 | 1.7773 |
| ERA 2 | -0.6825 | 0.3131 | -2.18 | 0.029** | -1.5119 | -0.1733 |
| ERA 3 | 1.7638 | 0.2464 | 7.16 | 0.000**** | 1.2808 | 2.1670 |
| DURABLE | -0.0073 | 0.0032 | -2.32 | 0.021** | -0.0117 | 0.0034 |
| DISNAT | 0.2562 | 0.2996 | 0.85 | 0.397 | -0.2359 | 2.5872 |
| DISOCC | -0.0488 | 0.1441 | -0.34 | 0.735 | -0.2689 | 1.1101 |
| DISREV | 0.0268 | 0.0894 | 0.30 | 0.765 | -0.1272 | 1.2786 |
| FREIGHT | 0.0061 | 0.0059 | 1.04 | 0.298 | -0.0039 | 0.0156 |
| VOTECHG | 1.3785 | 1.4737 | 0.94 | 0.350 | -1.9887 | 3.5010 |
| LOGCUR | -0.1273 | 0.1067 | -1.19 | 0.233 | 0.0004 | 0.0160 |
| CONSTANT | 1.6265 | 0.3307 | 4.92 | 0.000**** | -0.0048 | 1.7127 |

Sigma_u | 0.0046
Sigma_e | 0.0129
rho | 0.1112 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

Where: POPVOTE = Percentage of the population above the voting age with voting rights
ERA 2 = Dummy variable for period 1919 to 1938
ERA 3 = Dummy variable for period 1945 to 1973
DURABLE = Number of years since the most recent regime change
DISNAT = Dummy variable for national independence
DICOCC = Number of times country has been occupied
DISREV = Number of times country has experienced a revolution
FREIGHT = Traffic on state railways metric tons per capita
VOTECHG = Rate of change in POPVOTE
LOGCUR = First difference of logistic curve

## 6.4 DISCUSSION OF FINDINGS

The main purpose of the regressions is to ascertain whether state development and institutional flexibility can explain changes in economic growth across the selected countries. Ten independent variables are run on the dependent variable (the rate of GDP per capita growth). POPVOTE, FREIGHT and VOTECHG capture the role of state development in promoting economic growth. DURABLE, FLX, DEMFLX and LOGCUR capture Olson's theory of institutional sclerosis while ERA 2, ERA 3, DISNAT, DISOCC and DISREV capture the disruptive events, which Olson suggests should undermine vested interests and result in an acceleration of the rate of GDP per capita growth. Given similar results across the three models discussed in Section 6.3, with the exception of the institutional flexibility measure, this discussion will take each variable in turn and elaborate on why such a result is reported without making direct reference to Table 6.3.2, Table 6.3.4 or Table 6.3.6 directly. Table 6.4.1 presents a results summary for the three separate approaches taken to measure institutional flexibility. The original random effects GLS regressions, which include all sixteen independent variables and a measure of institutional flexibility, are presented in Appendices 6.10 to 6.12.

Table 6.4.1 provides an overview of the results for the ten independent variables included in the regression analysis in Section 6.3 for the three institutional flexibility measures. Notably, the only difference across all three columns is the statistical significance of the DEMFLX institutional flexibility measure at the 5% level of significance. This confirms the appropriateness of Hodgson's (1989) inverted U-shaped or hat-shaped institutional flexibility function. Furthermore, it confirms the application of the logistic curve to the democracy data for each country, identification of the inflection point, and correspondingly, the use of the year of inflection to coincide with the peak of institutional flexibility. This approach is now

deemed superior to both FLX and LOGCUR, building on the earlier work of Black (1966), Choi (1983) and Hodgson (1989).

**Table 6.4.1: Results Summary - Comparing Measures of Institutional Flexibility**

| VARIABLE | FLX YEARS | DEMFLX YEARS | LOGCUR |
|---|---|---|---|
| CONSTANT | 1% | 10% | 0.1% |
| POPVOTE | 1% | 0.1% | 5% |
| ERA 2 | 5% | 1% | 5% |
| ERA 3 | 0.1% | 0.1% | 0.1% |
| DURABLE | 10% | 10% | 5% |
| INST FLEX | | 5% | |
| DISNAT | | | |
| DISOCC | | | |
| DISREV | | | |
| FREIGHT | | | |
| VOTECHG | | | |
| ADJUSTED $R^2$ | 0.3763 | 0.4039 | 0.3708 |
| WALD $CHI^2$ | 108.75 | 111.40 | 108.82 |
| PROB > $CHI^2$ | 0.0000 | 0.0000 | 0.0000 |
| VIF | 2.09 | 2.21 | 2.11 |
| HAUSMAN | 0.9598 | 0.7790 | 0.8870 |
| B-P LM | 0.0669 | 0.0156 | 0.0282 |
| ADJUSTED $R^2$ (ALL 17 VARIABLES) | 0.4164 | 0.4203 | 0.4123 |

The $R^2$ in all three cases are respectable, given the length of time in question and nature of the data collected. The overall significance of each of the three models, tested by the Wald $chi^2$ statistic, finds all three to be statistically significant. The correlation between the individual effects and the independent variables is assumed to be zero. The variance inflation factor tests, once the selected independent variables discussed in Section 6.3 are dropped, ranges between 2.09 and 2.21. This confirms the absence of mulitcollinearity and is deemed more than acceptable given the size of the panel of data in question. Finally, both the Hausman Test and Breusch-Pagan Lagrangian Multiplier Test confirm the existence of random effects in the model and the appropriateness of using the random effects generalised least squares estimator.

### 6.4.1 Percentage of the population above the Voting Age with Voting Rights

A considerable amount of this thesis is devoted to the impact of democracy on economic growth. Chapter 4 provides an extensive review of the current body of literature surrounding the impact of democracy on economic growth. The empirical results presented here all report a positive relationship between democracy (POPVOTE) and economic growth over the long run. This is a significant finding given the extended timeframe under examination and set of countries considered. Table 4.5.1 in Chapter 4 suggests the longer the timeframe considered the more like democracy is to have a positive effect on economic growth. This is supported by the empirical results here and confirms that over the long term democracy, as measured by the percentage of the population above the voting age with the right to vote, is growth-promoting. This is not to say that democracy does not have damaging aspects, simply over the one hundred and twenty-seven year period considered, the variable has had a positive impact of the rate of economic growth. These results are in line with Dick (1974), Kormendi & Meguire (1985), Grier & Tullock (1989), Pourgerami (1988 & 1991), Scully (1988& 1992), Remmer (1990) Barro (1998), Minier (1998), Fidrmuc (2003), Gerring, Bond, Barndt & Moreno (2005), Rodrik & Wacizarg (2005), Butiewicz & Yanikkaya (2006).

Additionally, the set of countries examined, all of which are highly developed and among the richest in the world, has not been considered to date. Previous investigations regarding the relationship between democracy and economic growth have used samples containing developing countries only and a mixture of developed and developing countries together. These have produced mixed results. It seems likely that examining developed countries only will produce results supporting the compatibility hypothesis. This may be a resulted of the phased nature for the spread of democracy in developed countries. In almost all cases enfranchisement extended from men over thirty, to all men, to women of privilege and

eventually to all adults citizens. This process took decades to run its course. This is in contrast to the big bang approach of some developing countries which have moved from dictatorship to democracy in the space of weeks.

### 6.4.2 Dummy Variable for the Period 1919 to 1938 & 1945 to 1973

Of the four era dummy variables, ERA 2 (Interwar period) and ERA 3 (post-World War II to the end of Bretton Woods) prove to be statistically significant across all regressions. In all cases, ERA 3 proves highly significant. This is unsurprising given that this period is often referred to as the 'Golden Age of the West'. France, Germany, Italy and Japan amongst others experienced rapid economic growth, a consequence of reconstruction following the devastation of World War II and the destruction of narrow special-interests in these countries. This allowed for greater institutional flexibility, fostering innovation and competition, and resulted in higher levels of economic growth. There is certainly support for the Olsonain hypothesis from these result however catch-up growth cannot be ruled out. ERA 2 (Interwar period) is significant in all regressions, displaying a negative relationship with economic growth. This era dummy is not as robust as ERA 3. The level of significance varies across differing measures of institutional flexibility. The negative coefficient is largely due to the Great Depression which occurred during this period.

### 6.4.3 Regime Durability

Regime durability is taken from the Polity IV dataset. Interestingly, it is not only statistically significant at least at the 10% level, but more importantly, displays a negative coefficient. This finding is supportive of Olson's hypothesis. In stable societies, special-interest groups engage in collective action because the benefits from succeeding are confined to the group and the cost dispersed throughout society. Special-interest groups do not fade away through

time, resulting in slower growth rates and lower levels of income as innovation and change are stifled or prevented entirely. If follows, states with longer regime durability, will be inundated with special-interest groups and will consequently suffer with slower growth rates or display a greater degree of institutional sclerosis. Referring directly to Chapter 3, according to Olson (1982:77) institutional sclerosis will be more prevalent in

> "Countries that have democratic freedom of organisation without upheaval or invasion the longest will suffer the most from growth-repressing organisations and combinations. This helps explain why Great Britain, the major nation with the longest immunity from dictatorship, invasion, and revolution, has had in this century a lower rate of growth than other large, developed democracies"

The reported regime durability coefficients in all three sets of regressions add empirical weight to Olson's argument.

### 6.4.4 Institutional Flexibility

Institutional flexibility is central to all three sets of empirical results. Four interesting strands of enquiry can be deduced from the empirical results regarding institutional flexibility.

1. FLX when used to mark the peak of institutional flexibility proves to have no statistically significance. As mentioned, Black's (1966) years which are used in the construction of FLX, represent the commencement of the phase of EST and therefore are more likely to reflect a year when narrow special-interest were undermined or destroyed, leading to greater institutional flexibility rather than the high point of flexibility.
2. The significance of the DEMFLX approach to modelling institutional flexibility confirms the approach taken in Equation 5.5.3, used by Hodgson (1989), is the most appropriate functional form for institutional flexibility to take.

3. Applying Equation 5.5.3 to a new set of institutional flexibility years (DEMFLX), this research finds the variable can explain changes in the rate of economic growth. This is a significant contribution as it improves upon the arbitrary nature of the Black years, and while not identifying the commencement of EST, does ascertain the highpoint of institutional flexibility and the years thereafter when institutional sclerosis set in. The coefficient for all DEMFLX variables is positive indicating greater flexibility equates to faster growth and greater sclerosis results in slower growth, supporting the Olson view of economic development.
4. The first difference of the democracy data logistic curve (LOGCUR) proves to have no statistically significance. This estimation of institutional flexibility moves away from the inverted U-shaped function. Finding no statistical significance adds weight to Olson's rise and decline hypothesis, suggesting an inverted U-shape is a more appropriate way to model institutional flexibility.

### 6.4.5 Insignificant Independent Variables

Table 6.4.1 indicates five of the ten independent variables have no significant explanatory power across all three regressions. FREIGHT and VOTECHG consider if increases in freight traffic on railway lines and the rate of change in enfranchisement among the adult population can explain the rate of economic growth. Both are key indicators of state capacity. Neither is found to be statistically significant. The variables DISNAT, DISREV and DISOCC are taken from Hodgson (1996). These are run as further tests of the Olsonian hypothesis to establish if countries enjoyed an economic 'take-off' following national independence, revolution or occupation. The failure to find statistical significance in any of the three may be down to the crude approach taken to capture the variables. Further investigation in this area is warranted, with a more robust approach taken to measure the variables in question necessary.

## 6.5 CONCLUSIONS

The aim of this chapter is to bring together what proceeded in Chapters 2, 3, 4 and 5. Data collected and described in the previous chapter is used to produce the empirical results presented in Sections 6.2, 6.3 and 6.4. These results explain the impact of state development and institutional flexibility on economic growth. Section 6.2 presents the different approaches taken to model institutional flexibility. Peak years and the 'rise and decline' of each state is dependent upon the method used to model institutional flexibility. Section 6.3 tests these approaches empirically. The research finds that the DEMFLX measure of institutional flexibility is the most appropriate method to use when explaining the rate of economic growth across countries in the sample.

The research finds use of Black's years of EST as the peak of institutional flexibility (FLX) is not an appropriate technique, as the peak occurred much later than assumed by Black (1966). This research suggests the high point of economic and social transformation more likely occurred, just after World War I, nearly fifty years later than Black's EST years would suggest. Furthermore, FLX is not statistically significant in the panel regressions conducted. The econometric tests in Section 6.3 and discussion in Section 6.4 shed light on reasons behind the rate of economic growth across the fifteen countries examined and provide a new methodology to investigate this area. Democracy (POPVOTE), a much debated topic in growth literature (See Chapter 4), is found to be compatible with economic growth. Support is found for the Olsonian hypothesis as regime durability (DURABLE) is seen to negatively affect economic growth. Additionally, both ERA 2 and ERA 3 are statistically significant, with the latter again supporting the Olsonion hypothesis, as World War II is seen to have removed much of the institutional sclerosis in Europe, allowing a new growth trajectory to take off. This research finds that the volume of freight traffic per capita on state railway lines

(FREIGHT), the rate of change in the percentage of the population above the voting age with voting rights (VOTECHG), the incidence of revolution (DISREV), the achievement of national independence (DISNAT), foreign occupation (DISOCC) and the third measure of institutional flexibility (LOGCUR) are not statistically significant.

# CHAPTER 7 – CONCLUSION TO THE THESIS

## 7.1 INTRODUCTION

This thesis has sought to address and empirically test the impact of state development and institutional flexibility on long run economic growth across fifteen developed countries from 1880 to 2008. The key theme running through the thesis is the theory of a rise and decline of states. The rise is facilitated by the development of complex, flexible, impersonal and robust institutional arrangements, allowing the productive capacity of each state to be maximised. The decline is a direct result of the ossification of the same institutions, resulting in relatively slow economic growth. The passage of time, stability and enfranchisement of the mass of the population all contribute to this as self-interested narrow special-interest group's form and solidify once flexibility institutional arrangements. The consequences of this have been the slowing of growth rates across the developed world over the past fifty years.

While the focus of this work has been of a historical nature, spanning more than one hundred and twenty-five years, lessons can learned from the application of Olson's hypothesis to the modern state. In fact, it is the belief of the author that Mancur Olson's theory is in serious need of rehabilitation. While the extended period of stability the developed world has enjoyed has brought with it ever slowing growth rates, institutional sclerosis is not inevitable. Olson (1996b) claims countries suffering from institutional ossification or sclerosis can overcome it by learning from hard lessons and past mistakes. After all "no historical process that is understood is inevitable" (Olson, 1996b:87).

## 7.2 MAIN CONTRIBUTIONS

There are a number of key contributions to this work. Each will now be outlined and discussed in turn. It is hoped the contributions build on the work of others in the area, especially Cyril Black, Mancur Olson, Kwang Choi and Geoffrey Hodgson, and enables future researchers to use both constructed data and empirical results to further advance the institutional line of enquiry. The main contributions are as follows:

1. A rehabilitation of Mancur Olson's 'rise and decline' hypothesis and the fusing of this with the contributions of Black (1966), Choi (1983), Hodgson (1989 & 1996) and North, Wallis & Weingast (2009). Olson's hypothesis is in need of reintegration into wider institutional and economic growth literature. Not only does this work rehabilitate Olson, it unites the framework with Black (1966) and North, Wallis & Weingast (2009), building on the empirical work of Choi (1983) and Hodgson (1989 & 1996). These three empirical papers are between seventeen and thirty years old. This work is needed to update these earlier attempts to fuse Olson and Black.
2. An extensive review of literature into the relationship between democracy and economic growth is provided. More than thirty papers are considered and the results of each compared along six metrics; time period, number of years, sample size, level of country development, democracy measure and empirical findings. The literature review confirms differences emerge when assessing the impact of democracy on economic growth when different measures of democracy are used and when considering longer periods. The longer the timeframe considered the more likely democracy is to have a positive effect on economic growth. Democracy is regarded as compatible with long run growth in both developed and developing countries.

3. The extended period which is examined in this thesis, from 1880 to 2008, brought with it substantial challenges regarding data availability and data collection. Much of the data used in the tests has either been converted from raw data, in some cases hard copy format, into usable electronic data. Other data has been constructed using existing and related information. This thesis presents six new data sets covering the years 1880 to 2008 for fifteen developed economies. Electronic data is now available for the Rate of GDP per Capita Growth, General Government Revenue as Percentage of National Output, Exports as Percentage of National Output, Percentage of the Population above the Legal Voting Age with Voting Rights, Traffic on State Railways in Metric Tons per Capita and Relative Productivity with the United States of America for all fifteen countries from 1880 to 2008. This contribution should enable future research in this area and advance the institutional perspective as a means of explaining cross-country economic growth rates.
4. The methods discussed in Chapter 5 demonstrate a new method for calculating institutional flexibility. The application of the logistic curve to the newly created democracy dataset (See Point 3) is a unique way of measuring institutional flexibility across each of the fifteen countries. This approach has allowed for the identification of selected years in each country when institutional flexibility peaked. This contribution is an advancement of the comparative model of Black (1966) as the years selected by Black to mark economic and social transformation, amongst other things, are selected without a robust criteria. The new set of years presented in this thesis provides a more rigorous and systematic approach to measuring institutional flexibility, and by extension, state development.
5. The empirical results presented in Chapter 6 are the final contribution of this work. The results shed light on the impact of the selected variables of state capacity and

institutional flexibility on economic growth. Further discussion of these is now presented in Section 7.3.

## 7.3 FINDINGS AND FURTHER RESEARCH

This section concentrates on the empirical results presented in sections 6.2, 6.3 and 6.4. Section 6.2 uses the constructed democracy data and logistic curve to identify peak years of institutional flexibility. This approach suggests the peak occurred in each of the fifteen countries examined, between 1900 and 1942, with Australia the first (1900) and Italy the last (1942). The mean peak year is 1916. These findings indicate the high points of institutional flexibility used by Hodgson (1989) based on Black's (1966) years of EST are in need to revision. This work provides a revision of the peak years of institutional flexibility using a improved, rigorous approach to identifying each year.

The empirical results presented in Section 6.3 are an extension of all previous works in the area. The results illustrate the impact of state capacity and institutional flexibility on economic growth over the long run. POPVOTE, FREIGHT and VOTECHG capture the role of state capacity in promoting economic growth. DURABLE, FLX, DEMFLX and LOGCUR capture Olson's theory of institutional sclerosis while ERA 2, ERA 3, DISNAT, DISOCC and DISREV capture the disruptive events, which Olson suggests should undermine vested interests and result in an acceleration of the rate of GDP per capita growth. The results confirm the appropriateness of Hodgson's (1989) inverted U-shaped or hat-shaped institutional flexibility model, the application of the logistic curve to the democracy data for each country, identification of the inflection point, and the use of the year of inflection to coincide with the peak of institutional flexibility (DEMFLX). This approach is now deemed superior to both the FLX and LOGCUR measures of institutional flexibility and builds on the earlier work of Black (1966), Choi (1983) and Hodgson (1989). The adjusted $R^2$ in all three cases are respectable, given the length of time in question and nature of the data collected. The overall significance of each of the three models, tested by the Wald $chi^2$ statistic, finds all

three are statistically significant. Democracy, a much debated topic in growth literature (see Chapter 4), is found to be compatible with economic growth. Support is found for the Olsonian hypothesis as regime durability is seen to negatively affect economic growth. Additionally, both ERA 2 and ERA 3 are found to have significant explanatory power with the latter again supporting the Olsonion hypothesis as World War II is seen to have removed much of the vested interests or institutional sclerosis in Europe at the time allowing a new growth trajectory to take off.

The main area of potential future research is the extension of the sample size to include countries that were well developed around the last 1800s. Finland, Greece, Hungary, Ireland, New Zealand, Spain and Portugal could all be potentially added to the empirical tests. Some independent variables may have to be dropped due to lack of data availability. Since this project commenced the global financial crisis has occurred. Despite this fact the work covers nearly one hundred and thirty years, not since the Great Depression has the rate of GDP per capita growth (dependent variable) displayed a negative coefficient over a five year period. This would not be the case with the period 2008 to 2012. It would be interesting to see if the results presented here change given the unprecedented nature of the past five years and the impact global conditions have had on economic growth across all countries. Furthermore, it may be interesting to examine why institutional flexibility peaks at the inflection point of the democracy logistic curve. The rationale for this approach, as discussed, assumes the spread of democracy at low levels bring with it a diffusion and acceptance of new ideas, routines and behaviour. Once democracy moves beyond the inflection point, Olsonian effects are assumed to take hold. Testing this logic empirically is a challenge for future work.

## 7.4 CONCLUSION

This chapter seeks to review the main findings and contributions of the empirical work in this thesis and demonstrate the impact of state capacity and institutional flexibility on economic growth. The research concentrates on rehabilitating the work of Mancur Olson by promoting the idea of a 'rise and decline' of states. The principal research hypothesis asserts two opposing views of institutional development discussed throughout Chapter 2 and Chapter 3; the need for institutional development, on the one hand to facilitate growth, coupled with the growth-retarding nature the same institutions can cause once ossification sets in. The empirical results confirm both state capacity and institutional flexibility explain roughly 40% of the variation in the rate of GDP per capita growth from 1880 to 2008 for the fifteen countries considered. The results find evidence of the growth-promoting effects of increased state development and greater institutional flexibility and in doing so advocates the Olsonian hypothesis of a 'rise and decline' of states.

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**APPENDIX 3.1 - Changes to Voting Rights in Europe since 1820 – 1975 (Flora, 1983)**

## AUSTRIA

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1873 - 1907 | Restricted and unequal manhood suffrage in 4 electoral classes: Great land owners, Members of chambers of commerce and trade, 24 year old males of towns and cities who paid minimum taxes, 24 year old males of rural communes who paid minimum taxes. | Direct elections by electors of first three classes, indirect elections in forth class and fifth classes. Secret ballot or orally according to provincial law. Majority representation. |
| 1907 - 1911 | Abolition of class system. Universal and equal suffrage for males over 24. | Direct elections with secret ballot. Voting compulsory by provincial law in 4 provinces. Majority representation. |
| 1919 - 1934 | Universal and equal suffrage for all citizens over 20. | Direct elections with secret ballot. Voting compulsory by provincial law in two provinces. Proportional representation in multi member constituencies. |
| 1945 | Unchanged | Unchanged |
| 1968 | Voting age reduced to 19 | |

## BELGIUM

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1831 - 1892 | Equal but restricted manhood suffrage (regime censitaire): high direct tax minima differing in urban and rural areas; minimum voting age 25. 1848 reduction and standardisation of direct tax minima. 1871 voting age reduced to 21. | Direct elections, but no provisions for secrecy. Partial elections in two alternate groups of provinces every two years; general nationwide elections only after dissolution of parliament. Majority representation in multi-member constituencies: absolute majority required. |
| 1894 - 1914 | Universal and equal manhood suffrage: "plural voting" with 1 additional vote for house owners and real estate owners over certain value. 2 additional votes for citizens with higher education diploma and certain officials. Max 3 votes per person, minimum | Direct elections with secret ballot. Partial elections as before: compulsory voting. Majority representation as before. 1899 Proportional representation introduced. |
| 1919 - 1946 | Abolition of " plural voting"; universal and equal manhood suffrage for men over 21 (in addition: suffrage for mothers and widows of soldiers who had died in war). | Direct elections with secret ballot; compulsory voting. Abolition of partial elections |
| 1948 | Universal and equal suffrage for all men and women over 21. | Unchanged |

## DENMARK

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1849 - 1915 | Equal but restricted suffrage for male citizens of 30 years and over, expect servants and farm labourers not having their own household, and those receiving public poor relief (exclusions of gradually declining significance) | Direct elections; voting ballot or by show of hands. Majority representation: simple plurality system in single-member constituencies. 1901 Secret ballot introduced. |
| 1918 - | Universal and equal suffrage for all men and women of 29 years and over. 1920 voting reduced to 25 years. 1952 voting reduced to 23 years. 1961 voting reduced to 21 years. 1971 voting reduced to 20 years. | Direct elections with secret ballot. Proportional representation: from 1918 mostly in single member constituencies with additional seats to ensure proportional representation; but for 1920 (first election) in multi-member constituencies with additional seats. |

## FRANCE

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1815 - 1816 | Almost universal and equal manhood suffrage (excluding dependents) for primary elections; Restricted and unequal manhood suffrage in the electoral colleges because of strict criteria of eligibility. | Indirect elections: Primary assemblies elect lifetime members of electoral colleges. Electoral colleges elect members of parliament. Majority representation at both stages. |
| 1824 -1830 | Restricted and unequal suffrage for male citizens of 30 years and over: general electorate restricted by high direct tax minima: the upper 25% of the general electorate paying highest direct taxes constituted an additional electoral body | Direct elections: The general electorate elects 60% of members of parliament. 40% elected at "departement" assemblies of highest taxpayers. No strict provisions for secrecy. Majority representation. Absolute majority system in single-member constituencies |
| 1831 - 1846 | Restricted, but almost equal manhood suffrage for citizens of 25 years and over: high but reduced direct tax minima (regime censitaire). | Direct elections with secret ballot. Majority representation: absolute majority system as before. |
| 1848 - 1936 | Universal and equal suffrage for all male citizens of 21 years and over. | Direct elections; No provision for secrecy up to 1869. Majority representation with several variations: 1848: Relative majority system in multi-member constituencies. 1852: Absolute majority on first ballot, relative majority on second ballot; single member |
| 1945 - | Universal and equal suffrage for all men and women of 21 years and over. 1975 voting age reduced to 18. | Direct Elections with secret ballot. Proportional Representation in multi-member constituencies. 1958 Majority representation: absolute majority on first ballot, relative majority on second. |

## GERMANY

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1848 | Universal and equal suffrage (with insignificant exceptions) for all male citizens, with minimum age differing in the German states. | Indirect and secret elections. Primary voters elect electors, proportional in number; electors elect members of parliament. Majority representation: in general, absolute majority system with second ballot runoff election. |
| 1871 - 1918 | Universal and equal suffrage for all male citizens of 25 years and over. | Direct and secret elections. Majority representation in single-member constituencies: absolute majority required first ballot and on second ballot runoff election between top two candidates. |
| 1919 - 1933 | Universal and equal suffrage for all men and women of 20 years and over. | Direct and secret elections. Proportional representation: seats allocated to regional and national lists. |
| 1949 - | Universal and equal suffrage for all citizens of 21 years and over. 1970: Voting age reduced to 18 years. | Direct and secret elections. Proportional representation: Since 1953, each voter has two votes. |

## ITALY

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1861 - 1909 | Equal but restricted manhood suffrage. 1861: Limited to citizens of 25 years and over who paid minimum direct taxes and who could read and write. 1882: Limited to citizens of 21 years and over with qualifications as before, but reduction of tax minima. | Direct elections with secret ballot. Majority representation in single-member constituencies: absolute majority required on first ballot or relative majority on second ballot. 1882: Majority representation: simple majority system in multi-member constitute |
| 1913 - 1924 | 1913: Almost universal and equal suffrage of 30 years and over; in addition, for male citizens of 21 years and who had completed their military service or had finished primary school, paid minimum tax, exercised official functions. 1919: Universal and equal suffrage for all men over 21 years | 1913: Direct elections with secret ballot. Majority representation as before. 1919: Direct elections with secret ballot. Proportional representation in multi-member constituencies. 1924: System as before, but with bonus for largest party (Fascist election). |
| 1946 - | Universal and equal suffrage for all men and women of 21 years and over | Direct elections with secret ballot. Proportional representation in multi-member constituencies. |

## NETHERLANDS

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1849 - 1894 | Equal but restricted manhood suffrage for citizens of 23 years and over surpassing relatively high direct tax minima. 1887 reduction of direct tax minima and equivalent requirements of renting or owning a house above a certain rental value. | Direct Elections with secret ballot. Majority representation. Election of half of member every two years in "double constituencies" so that one of the two members is always elected for a four year term; absolute majority required on first ballot, simple majority required. |
| 1897 - 1917 | Equal but restricted suffrage for male citizens of 25 years and over, with relatively low qualifications: alternatively paying direct taxes over certain minima, living in houses with a certain rental value, receiving wages or pensions over a given minim | Direct Elections with secret ballot. Majority representation in single-member constituencies; majority requirements as before. |
| 1918 | Universal and equal suffrage for male citizens of 25 years and over. | Direct elections with secret ballot. Proportional Representation. Compulsory voting introduced. |
| 1922 - | Universal and equal suffrage for men and women of 25 years and more. 1945 age reduced to 23 years. 1965 age reduced to 21 years. 1972 age reduced to 18 years. | Unchanged. 1970 compulsory voting abolished. |

## NORWAY

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1815 - 1897 | Equal but restricted manhood suffrage with relatively high occupational and property requirements such as Kings officials, freehold and leasehold farmers, owners of urban property, citizens licensed as merchants or artisans. | Indirect elections with open voting. Majority representation: Electors elected by plurality in cities resp. parishes; number of electors proportional to number of enfranchised population. 1885 Secret ballot introduced. |
| 1900 - 1912 | Almost universal and equal suffrage for male citizens of 25 years and over; suffrage temporarily suspended in cases of bankruptcy and for paupers receiving public assistance. 1909: extension of suffrage also to women if own or husband's income exceeded certain minimum. | Indirect, secret elections. Majority representation as before. 1906: Direct elections with secret ballot. Majority representation in single-member constituencies: absolute majority required on first ballot, relative majority on second. |
| 1915 | Almost universal and equal adult suffrage for citizens of 23 years and over. 1946: Voting age reduced to 21 years | Unchanged. 1921: Direct elections with secret ballot. Proportional representation in multi-member constituencies. |

**SWEDEN**

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| 1866 - 1908 | Equal but restricted manhood suffrage with relatively high economic qualifications. Alternatively property above a certain value, leasing of farmland above a certain value, income above a given minima. Voting age 21 years. | Partly direct, partly indirect elections with secret ballot. Majority representation, in most cases in single-member constituencies. |
| 1909 - 1920 | Almost universal and equal suffrage for male citizens of 24 years and over, excluding recipients of public poor relief. | Direct elections with secret ballot. Proportional Representation. |
| 1921 - | Universal and equal suffrage for men and women of 23 years and over (with certain insignificant exceptions ended in 1945). 1945 voting age reduced to 21 years. 1969: voting age reduced to 19 years. | Unchanged |

## SWITZERLAND

| Universal Suffrage | Suffrage Requirements | **Voting Procedures** |
|---|---|---|
| 1848 - 1869 | Universal and equal suffrage for male citizens of 20 years and over. | Direct elections; secret or oral voting according to cantonal legislation. Majority representation: constituencies of varying size (each voter having as many votes as seats to be filled in the constituency); absolute majority required on first and second ballot. |
| 1872 - 1917 | Unchanged | Direct elections with secret ballot according to federal legislation. Majority representation as before; since 1900, absolute majority required only on first ballot, simple majority on second. |
| 1919 - 1967 | Unchanged | Direct and secret elections. Proportional representation. |
| 1971 – | Universal and equal suffrage for men and women of 20 years and over. | Unchanged |

## UNITED KINGDOM

| Universal Suffrage | Suffrage Requirements | Voting Procedures |
|---|---|---|
| Prior to 1832 | Restricted and unequal manhood suffrage with relatively high, but locally different economics requirements:<br>In counties; real estate of certain rental value,<br>In boroughs: very different criteria, mostly local taxes. | Direct Elections; in most cases, public nomination and open voting. Majority representation: plurality system, mostly in two-member constituencies of very different size (between the constituent parts of the UK and between urban and rural areas). |
| 1832 - 1865 | Electoral Reform 1832: Reduction and standardisation of income and property qualifications:<br>In counties: Freeholders and leaseholders with real estate of a certain rental value.<br>In boroughs: Householders with property. | Redistribution of approx. 140 seats out of 658 in order to equalise the size of constituencies. 1854 elimination of corrupt practices (bribery, intimidation, etc.) |
| 1868 - 1880 | Electoral reform 1867/78 for England and Scotland: reduction of income and property qualifications:<br>In counties: Freeholders, leaseholders and copyholders with minimal rent.<br>In boroughs: Householders and lodgers paying minimum. | Redistribution of 52 seats. 1872: Secret ballot introduced and public nomination abolished. |
| 1885 -1910 | Electoral Reform 1884/85: Reduction and standardisation of qualifications for both counties and boroughs in all parts of the UK. Uniform householder and lodger franchise. Uniform occupation franchise. "plural voting" continued (business and university vote). | Redistribution of 134 out of 670 seats; single-member constituencies as a rule. |
| 1918 - 1924 | Universal and almost equal suffrage for male citizens of 21 years and over; in addition suffrage for women of 30 years and over who are householders of wives of householders; "plural voting" restricted to max of 2 votes. | Redistribution of seats on the basis of approx. equal electorates. |

| | | |
|---|---|---|
| 1928 | Universal and almost equal suffrage for men and women of 21 years and over; "plural voting" continued (business and university votes). 1948 University seats and all "plural voting" abolished. 1969 voting age reduced to 18 years. | Direct Elections with secret ballot. Majority representation: relative majority system in single member constituencies. Redistribution of seats and installations of permanent boundary commissions. |

## APENDIX 5.1

## Disruption due to National Independence (DISNAT)

| | 1880 | 1885 | 1890 | 1895 | 1900 | 1905 | 1913 | 1925 | 1930 | 1938 | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Austria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Belgium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Canada | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| France | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Germany | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Italy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Japan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Netherlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United Kingdom | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

## APPENDIX 5.2

## Disruption due to Occupation (DISOCC)

| | 1880 | 1885 | 1890 | 1895 | 1900 | 1905 | 1913 | 1925 | 1930 | 1938 | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Austria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Belgium | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Canada | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| France | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Germany | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Italy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Japan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Netherlands | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Norway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| United Kingdom | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| United States | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## APPENDIX 5.3

## Disruption due to Revolution or Civil War (DISREV)

| | 1880 | 1885 | 1890 | 1895 | 1900 | 1905 | 1913 | 1925 | 1930 | 1938 | 1950 | 1955 | 1960 | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2008 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Austria | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Belgium | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Canada | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| France | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Germany | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Italy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Japan | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Netherlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Norway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Switzerland | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| United Kingdom | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| United States | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

# APPENDIX 5.4

## 5.4.1 Australia

Total central government expenditure and central government revenue at current prices are presented for Australia from 1901 to 2002 in Australian Dollars. General government revenue as a percentage of GDP is available from the Reserve Bank of Australia from 1950 to 2008. National accounts are available from 1880 to 2000 and are measured using GDP. Extrapolation is used to estimate years from 1880 to 1900. No interpolation is required. The value of Australian imports and exports is available from 1880 to 1959 in Australian Pounds, from 1960 1996 in Australian dollars and from 1997 to 2004 in US Dollars. Primary school enrolment figures are available continuously from 1880 to 2003. The population size is observed fourteen times from 1880 to 2008. The year's this occurs are 1881, 1891, 1901, 1911, 1921, 1933, 1947, 1954, 1961, 1971, 1981, 1992, 1998 and 2003. The length of open railway line in kilometres is recorded from 1880 to 2003. Freight traffic on state railways is recorded from 1880 to 1993 in metric tons. The extent of voting rights among the population is observed thirty-two times between 1880 and 2008. Polity IV measures of regime durability and POLCOMP are available from Australian independence in 1901 to 2008.

## 5.4.2 Austria

Nominal total central government expenditure in millions of Gulden is available for Austria from 1880 to 1883, in Austrian Kronen from 1894 to 1915, in Austrian Schillings from 1923 to 1937 and again from 1948 to 1993. Total central government expenditure is available in US Dollars from 1994 to 2000. Nominal central government revenue is available in Gulden from 1880 to 1892, from 1892 to 1915 in Kronen and from 1924 to 1993 in Schillings. General government revenue is available in the years 1925 to 1928 and from 1955 to 2008. Nominal national accounts totals are available from 1880 to 1913 in Austrian Kronen, from

1924 to 1937 and 1948 to 1998 in Austrian Schillings. From 1880 to 1913 output in measured as GDP. From 1924 onwards output is measured as GNP at current prices. Interpolation is required for the year 1938. Data is missing for 1946. Current year values of aggregate external trade are available from 1880 to 1916 measured in Kronen for Austria. Data is available from 1920 to 1937 and from 1947 to 1993 in Schillings. Total aggregate trade is measured in US dollars from 1994 – 2000. Primary school numbers are available from 1880 to 1914, 1917 to 1936 and from 1945 to 2002. The population size is observed in the years 1880, 1890, 1900, 1910, 1923, 1934, 1951, 1961, 1971, 1981, 1991 and 2001. This allows the education variable to be observed twelve times between 1880 and 2008. Railway lines in kilometres are recorded from 1880 to 1913 for Austria-Hungary, and from 1919 to 1936 and 1946 to 2003 (excluding 1947 and 1949) for Austria. The volume of freight traffic, measured in metrics tons, is reported for Austria from 1880 to 1912, from 1922 to 1936 (excluding the years 1923 and 1926) and from 1948 to 2002. The prevalence of democratic entitlements is observed thirty-two times from 1880 to 2008. From 1880 to 1901 there is restricted and unequal manhood suffrage in four electoral classes. The four are land owners, members of chambers of commerce, 24 year old males of towns and cities who paid minimum taxes and 24 year old males of rural communes who paid minimum taxes. Direct elections are held for the first three class and indirect elections in forth class. Voting is conducted by secret ballot or orally according to provincial law with majority representation. The class system is abolished in 1907, with the establishment of universal and equal suffrage for males over 24 until 1911. In 1919 universal and equal suffrage for all citizens over 20 is introduced. Direct elections are conducted by secret ballot, with voting compulsory, according to provincial law, in two provinces. Proportional representation is used across multi member constituencies. In 1968 the legal voting age is reduced to 19. Government durability and POLCOMP are taken from Polity IV and are reported, for all years, from 1880 to 2008.

### 5.4.3 Belgium

Nominal total central government expenditure and nominal total central government revenue in millions of Belgian Francs is available from 1880 to 1912 and from 1920 to 1993. General government revenue is recorded in 1936 and 1938 and from 1950 to 2008. Nominal national accounts totals are available in 1913, 1924, 1927, 1930, 1934 to 1939, 1941 1943, and from 1946 to 2000. Net National Product (NNP) is used as the measure of national output from 1913 to 1948; GNP is used thereafter. Interpolation is required for the year 1925. All data between 1880 and 1920 is estimated using exponential log extrapolation. Trade data is recorded from 1880 to 1913 and from 1919 to 1993 in Belgian Francs. Remaining years are presented in US Dollars. Primary school numbers are available from 1881 to 1914 and from 1919 to 1998. Population figures are presented in the years 1880, 1890, 1900, 1910, 1920, 1930, 1947, 1961, 1970, 1981, 1991, 1998 and 2001. Open kilometres of railway line are available for Belgium from 1880 to 1913 and again from 1919 to 2003. The volume of freight traffic is recorded, in metric tons, from 1880 to 1913 and from 1920 to 1998. The extent of democratisation of the population is observed thirty-two times between 1880 and 2008. From 1880 to 1892 equal but restricted manhood suffrage exists for all those aged 21 and older. Direct elections are held with no provisions for secrecy. Majority representation in multi-member constituencies is used to determine the outcome of these elections. In 1884 universal and equal manhood suffrage with secret ballot is introduced. Plural voting exists with one additional vote for house owners and real estate owners over certain value, two additional votes for citizens with higher education diplomas and certain officials. Voting is limited to a maximum of three votes per person. Proportional representation is introduced in 1899. In 1919 plural voting is abolished, with the introduction of universal and equal manhood suffrage for men over 21 and suffrage for mothers and widows of soldiers who had died in

war. In 1948 universal and equal suffrage for all men and women over 21 is introduced. Durability of the government and POLCOMP are taken from Polity IV from 1880 to 2008.

### 5.4.4 Canada

Canadian central government expenditure and revenue is presented from 1880 to 2001 in Canadian Dollars. General government revenue is available from 1970 to 2008. National accounts for Canada are presented for the years 1880, 1890, 1900, 1910, 1920 and from 1926 to 1994 measured using GNP. Accounts are recorded as GNP from 1995 to 2000. All are presented at current prices in Canadian Dollars. Linear interpolation is required for the years 1885, 1895, 1905, 1913 and 1925. Nominal trade totals for imports and exports are recorded from 1880 to 2004 in Canadian dollars. Enrolment in all Canadian schools is presented from 1880 to 2001. The years 1997 and 1999 are omitted. Census data is recorded fourteen times between 1880 and 2008 (1881, 1891, 1901, 1911, 1921, 1931, 1941, 1951, 1961, 1971, 1981, 1991, 1996 and 2002). Open railway line in kilometres is available from 1880 to 2004. The volume of freight traffic in metric tons is recorded from 1880 to 1992. The number of citizens in the population above the voting age with a right to vote is reported thirty-two times between the years 1880 and 2008. Measures of regime durability are available from 1880 to 2008. POLCOMP is measured from 1880 to 1887 and from 1920 to 2008.

### 5.4.5 Denmark

Danish data on total central government expenditure and revenue is available continuously from 1880 to 1993 in Danish Kroner and from 1994 to 2000 in US Dollars. General government revenue is recorded in the years 1882, 1887, 1897, 1905, 1906, 1914, 1924, 1926, 1929, 1932, 1939 and from 1950 to 2008. National accounts are available from 1880 – 2000 in Danish Kroner. GDP is used as the measure of national output throughout. No

interpolation or extrapolation is necessary. Aggregate trade values are presented from 1880 to 1993 in Danish Kroner with the remaining values presented in US Dollars. Primary school numbers are available for the years 1893, 1897 and 1902, and continuously from 1904 to 2004. Population numbers are recorded in the years 1880, 1890, 1901, 1911, 1921, 1930, 1940, 1950, 1960, 1970, 1981, 1990, 1998 and 2001; a total of fourteen observations. The length of open railway lines in kilometres is recorded continuously from 1880 to 2003, while freight traffic is available from 1880 to 1940, 1944 to 1976 and 1979 to 2004. The extent of voting rights among the population is observed forty-four times, more than any other country in the sample, between 1880 and 2008. From 1880 to 1915 equal but restricted suffrage exists for male citizens of 30 years and above. This does not include servants and farm labourers without their own household or those receiving direct welfare payments from the state. Direct elections are held with voting by ballot or by show of hands. In 1901 a secret ballot is introduced. Majority representation used to determine the outcome with a simple plurality system in single-member constituencies. In 1918 universal and equal suffrage for all men and women of 29 years and over is introduced. In 1920 the voting age is reduced to 25 years with secret ballot and proportional representation also introduced to determine election outcomes. The voting age is further reduction in 1952 to 23 years. In 1961 the voting age is reduced to 21 years and to 20 years in 1971. All Polity IV institutional measures are available from 1880 to 2008.

### 5.4.6 France

Total central government expenditure and revenue is available from 1880 to 1959 in Francs, from 1960 to 1993 in new Francs[10]. General government revenue as a percentage of GDP is

[10] In January 1960 the new French franc was circulated for the first time and was the equivalent of 100 existing Francs.

recorded in 1920, 1925, 1930, 1935 and from 1952 to 2008. GDP figures are available from 1880 to 1913, from 1920 to 1938 and from 1949 to 1958 in Francs. From 1959 to 1998 GDP is available in new Francs at current prices. GDP is presented in US Dollars in 1999 and 2000. Data is missing for 1946 and 2000. Trade data is available from 1880 – 1958 in French Francs and from 1959 to 1993 in new Francs. US Dollars are used to measure aggregate external trade volume from 1994 to 2000. Primary school numbers are available from 1880 to 1912 and from 1917 to 2005. Estimates of the French population are reported a total of twenty time. These years are 1881, 1886, 1891, 1896, 1901, 1906, 1911, 1921, 1926, 1931, 1936, 1946, 1954, 1962, 1968, 1975, 1982, 1991, 1993 and 2001. French railway line length in kilometres is presented in an unbroken series from 1880 to 2003. Freight traffic in metric tons is reported continuously from 1880 to 1998. The extent of voting rights among the population is observed twenty-nine times between 1880 and 2008. From 1880 to 1936, France granted universal and equal suffrage for all male citizens of 21 years and over. Direct elections are carried out with secret ballot. In 1945 universal and equal suffrage is granted to all men and women of 21 years and over. This is reduced to 18 years of age in 1975. Measures of regime durability are available from 1880 to 2008. POLCOMP is measured from 1880 to 1918 and from 1929 to 2008.

### 5.4.7 Germany

German total central government expenditure and revenue at current prices is recorded from 1880 to 1934 in Marks. Separate data on both expenditure and revenue is available for East and West Germany from 1950 until 1989 in Marks. For the purposes of this research, these totals are combined. Central government expenditure data is presented from 1990 to 1993 for reunified Germany. Central government revenue is only reported for West Germany from 1990 to 1993. Aggregate totals for Germany become available for both from 1990 to 1993.

General government revenue as a percentage of GDP is recorded in 1881, 1891, 1901, 1902, 1903, 1905, 1907, 1908, 1913, 1925, 1928, 1930, 1933, 1936, 1937 and from 1950 to 2008. National accounts, recorded as NNP, are on hand from 1880 to 1913 and from 1925 to 1938. National accounts for East Germany measured as NNP is available from 1949 to 1988. National accounts for West Germany are presented from 1949 to 1993 in GDP. Again, for the purposes of this research the two are combined from 1949 to 1988. Aggregate data for Germany is presented in Marks from 1994 to 1998 and in US Dollars in 1999 and 2000. Linear interpolation is required for 1935 and 1935. Primary school numbers are available for the years 1900, 1905 and 1910, 1921, 1925, 1930, 1935, 1936, 1938, and 1939. Primary school numbers from West Germany are presented from 1950 to 1990 and from 1951 to 1988 for East Germany. Germany data becomes available again from 1991 to 2005, excluding the years 1999 to 2002. The size of the German population is recorded seven times between 1880 and 1939 (1880, 1890, 1900, 1910, 1925, 1933 and 1939). West German population numbers are available in the years 1946, 1950, 1961, 1970 and 1980. East German numbers are recorded for the years 1946, 1950, 1964, 1971 and 1981. Population numbers for reunified Germany are available for 1990 and 2001. The extent of open railway lines in Germany in kilometres is available from 1880 to 1939, from 1949 to 1988 for West Germany, from 1950 (excluding 1951 to 1958) to 1988 for East Germany and finally for reunified Germany from 1989 to 2003. Freight traffic on German railway lines is available for the state from 1888 to 1892 and 1895 to 1938, with the exception of the year 1917. Data is then divided between East and West Germany, with the latter reporting freight traffic volume from 1947 to 1990 and the former from 1949 to 1988. Fright traffic in metric tons is available for the entire state from 1991 to 1998. The extent of democratisation of the population is observed thirty-three times between 1880 and 2008. From 1880 to 1918 universal and equal suffrage is granted to all male citizens of 25 years and over. Elections are secret with majority representation in

single-member constituencies. An absolute majority is required in the first ballot to be deemed elected. In 1949, universal and equal suffrage is granted to men and women of 20 years and over with secret elections and proportional representation. In 1949 universal and equal suffrage is granted to all citizens of 21 years and over. This is reduced to 18 years in 1970. Data for all Polity IV variables is reported for German from 1880 to 1945 and from 1990 to 2008.

### 5.4.8 Italy

Data for Italian total central government expenditure at current price is available from 1880 to 1998 in Lira and for 1999 and 2000 in Euros. Data for Italian total central government revenue is recorded from 1880 to 1993 in Lira. General government revenue as a percentage of GDP is available for the years 1880, 1885, 1891, 1895, 1900, 1912, 1921, 1936, 1931, 1936, 1938, 1939 and from 1951 to 2008. National accounts are presented from 1880 to 1950 in GNP and from 1951 to 2000 in GDP. All national accounts are recorded at current price in Lira with the exception of 1999 and 2000 which are measure in US Dollars. No interpolation or extrapolation is required. Primary school enrolment numbers are recorded continuously from 1880 to 2002. The size of the Italian population is recorded in the years 1881, 1891, 1901, 1911, 1921, 1931, 1936, 1951, 1961, 1971, 1981, 1991 and 2001; a total of thirteen observations of the population. Italian railway length is reported in kilometres from 1880 to 2002, excluding the years 1943 and 1944. Freight traffic data is available from 1880 to 2004 with the exception of the years 1997 to 1999. Between 1880 and 2008 the number of people in the population, aged above the legal voting age that are enfranchised, is observed thirty-one times. From 1882 to 1913 only Italian citizen 21 years and over, with qualifications, were entitled to vote in direct, secret ballot elections. In 1913 universal and equal suffrage is granted to all citizens 30 years of age and over. In addition, male citizens of 21 years and who

have completed military service or have finished primary school, paid minimum tax or exercised official functions, are entitled to vote. In 1946 Italy introduces universal and equal suffrage for all men and women of 21 years and over with proportional representation in multi-member constituencies used to determine election outcomes. Polity IV measures of regime durability and POLCOMP are available from 1800 to 2008.

### 5.4.9 Japan

Nominal central government expenditure for Japan is on hand from 1880 to 1993 in yen. Nominal central government revenue is available for the same period. General government revenue as a percentage of GDP is available from 1970 to 2008. National accounts are recorded in Yen from 1885 to 1930 with GNP used as the measure of national output. GDP is used from 1931 to 2000. Data is missing for 1995 and 2000. It has been necessary to extrapolate trade figures for Japan back to 1880. While export volumes are available, national output data is not. An exponential log is estimated from the earliest year that output is report to the beginning of the First World War. From these estimates, data is extrapolated back to 1880. Five observations are extrapolated for Japan (1880 to 1884). Trade data is recorded from 1880 to 1943, from 1946 to 1996 in Japanese Yen and from 1997 to 2004 in US Dollars. Primary school enrolment figures are available continuously from 1880 to 2001. The population size is observed a total of fourteen times in the years 1884, 1893, 1903, 1913, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990, 1995 and 2003. The length of open railway line in kilometres is recorded from 1880 to 2002. Freight traffic on state railways is recorded from 1886 to 1998 in metric tons. The extent of democratisation of the population is observed thirty-two times between 1880 and 2008. Government durability and POLCOMP are taken from Polity IV and are reported, for all years, from 1880 to 2008.

### 5.4.10 Netherlands

Dutch central government expenditure is available from 1880 to 1998 in Guilders and for 1999 and 2000 in Euros. Dutch central government revenue, measured in Gilders, is available from 1880 to 1993. General government revenue as a percentage of GDP is recorded in the years 1902, 1907, 1912, 1917, 1922, 1927, 1930, 1935 and from 1950 to 2008. Dutch national accounts are available from 1900 to 1947 measured as NNP and from 1948 to 2000 measured as GDP. With the exception of 1999 and 2000, where US Dollars are used, all other years are measured in Guilders. Extrapolation is required for the years 1880 to 1899 inclusive. Primary school enrolment numbers are recorded continuously from 1880 to 2005. The size of the Dutch population is available for the years 1879 (used for 1880), 1889, 1899, 1909, 1920, 1930, 1940, 1947, 1960, 1970, 1980, 1991, 1998 and 2001. The extent of Dutch railway lines is reported continuously from 1880 to 2004. With the exception of the year 1890, Dutch freight traffic volumes, measured in metric tons, is available every year from 1880 to 2004. The prevalence of democratic entitlements is observed thirty-seven times from 1880 to 2008. From 1880 to 1891 equal but restricted suffrage existed for male citizens of 25 years and over in direct elections with secret ballot. From 1897 to 1917 equal but restricted suffrage is granted to male citizens of 25 years and over, with relatively low qualifications or those paying direct taxes over certain minima, living in houses with a certain rental value, receiving wages or pensions over a given minima. In 1918 universal and equal suffrage is granted to all male citizens of 25 years and over. Proportional representation and compulsory voting are also introduced. In 1922 universal and equal suffrage is extended to women of 25 years and more. The voting age is reduced to 23 in 1945, 21 in 1965 and 18 in 1972. Compulsory voting is abolished in 1970. All Polity IV institutional measures are available from 1880 to 2008.

### 5.4.11 Norway

Total central government expenditure is presented for Norway from 1880 to 2000 in Norwegian Kroner with missing data for the year 1998. Total central government revenue is presented for Norway from 1880 to 1993 in Norwegian Kroner. Norwegian general government revenue as a percentage of GDP is reported every five years from 1880 to 1935 and continuously from 1950 to 2008. National accounts are presented using GNP as the measure of output from 1880 to 1939 as measured in Kroner. National accounts are measured using GDP, again in Norwegian Kroner, from 1946 to 1998. National accounts for 1999 and 2000 are recorded in US dollar with GDP used as the measure of output. No interpolation or extrapolation is necessary. Primary school enrolment numbers are recorded continuously from 1880 to 2005. Census numbers for Norway are reported thirteen times (1890, 1900, 1910, 1920, 1930, 1946, 1950, 1960, 1970, 1980, 1990, 1998 and 2001) between the years 1880 and 2008. Both Norwegian open railway line in kilometres and freight traffic on railways, measured in metric tons, are available in unbroken series', with the former reported from 1880 to 2003 and the latter from 1880 to 1998. The extent of democratisation of the population is observed thirty-five times between 1880 and 2008. Until 1897 voting rights were extended only to males with relatively high occupational and property requirements such as the King's officials, freehold and leasehold farmers, owners of urban property, citizens licensed as merchants or artisans. Secret ballot is introduced in 1885. From 1900 to 1912 universal and equal suffrage for male citizens exists for those aged 25 years and over. Suffrage can be temporarily suspended in cases of bankruptcy and for citizens receiving benefit assistance. In 1909 sees the extension of suffrage to women if their husband's income exceeded a certain minimum. Universal and equal adult suffrage for all citizens of 23 years and over is introduced in 1915 with proportional representation introduced in 1921. The

voting age reduced to 21 years in 1946. All Polity IV institutional measures are available from 1880 to 2008.

### 5.4.12 Sweden

Swedish data on central government expenditure is recorded in Swedish Kroner from 1881 to 2000. Swedish data of central government revenue is reported from in Swedish Kroner 1880 to 1993. General government revenue as a percentage of GDP for Sweden is available from every ten years from 1880 to 1910. It is reported again in 1913, 1918, 1923, 1928, 1933, 1938 and 1943. General government revenue is available continuously for Sweden from 1949 to 2008. National accounts are obtainable from 1880, measured using GDP and run unbroken to 2000, with the final two years measured in US Dollars as opposed to Kroner elsewhere. Primary school numbers are available for the years 1886 and 1890 and continuously from 1898 to 2004. Records on the population of Sweden are available for thirteen individual years between 1880 and 2008. These years are 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980, 1990 and 2001. The length of open railway lines and the volume of freight traffic in Sweden are both presented continuously from 1880 to 2004, measured in kilometres and metric tons respectively. Between 1880 and 2008 the number of people in the population, aged above the legal voting age that are enfranchised, is observed thirty-eight times. Until 1908 voting rights are equal but restricted to males above twenty-four years, with relatively high economic qualifications, those with property above a certain value, those leasing farmland above a certain value or male citizens with an income above a given minima. From 1909 universal and equal suffrage is extended to all male citizens of twenty-four years and over, excluding recipients of state welfare. A secret ballot and proportional representation are introduced. In 1921 suffrage is extended to all men and women of 23 years and over. In 1945

the voting age is reduced to 21 years, with a further reduction to 19 years in 1969. Polity IV measures of regime durability and POLCOMP are available from 1880 to 2008.

### 5.4.13 Switzerland

Swiss central government expenditure data is available from 1880 to 2000 in Swiss Francs. Swiss central government revenue data is available from 1880 to 1993 in Swiss Francs. General government revenue is available for the years 1910, 1930, 1938, 1945 and from 1950 to 2008. National accounts first become available in 1913 as measured by NNP. 1924 is the next year national accounts are presented, again with NNP used. Output total are then available from 1930 to 1949 in NNP, from 1950 – 1979 in GNP and from 1980 to 2000 in GDP. All years are recorded in nominal Swiss Francs with the expectation of 1999 and 2000 where US Dollars are used. Linear interpolation is needed for the years 1920 and 1925. Extrapolation is required for years used in the estimations from 180 to 1913. The years 1995 and 2000 are missing. It has been necessary to extrapolate trade figures for Switzerland back to 1880 as while export volumes were available for both countries, national output data is not. An exponential log is estimated from the earliest year that output is report to the beginning of the First World War. From these estimates, data is extrapolated back to 1880. Nineteen observations are extrapolated for Switzerland from 1880 to 1889. Primary school numbers are available for the years 1891 and 1884, continuously from 1887 to 1911 and 1915 to 1948. Data is presented for the years 1951, 1953, 1956, 1959 and 1961. Population numbers are reported in the years 1880, 1888, 1900, 1910, 1920, 1930, 1914, 1950, 1960, 1970, 1980, 1990, 1998 and 2001. Swiss railway length in kilometres is reported from 1880 to 2002. Freight traffic on railway lines is available from 1880 to 1996 and from 2000 to 2003. The extent of democratisation of the population is observed thirty-four times between 1880 and 2008. From 1880 to 1971 universal and equal suffrage is granted only to male citizens of 20

years and over. From 1880 to 1917 direct elections are decided by secret ballot according to federal legislation. Proportional representation is introduced in 1919. After 1971 all citizen over twenty are entitled to vote. Government durability and POLCOMP are taken from Polity IV and are reported, for all years, from 1880 to 2008.

### 5.4.14 United Kingdom

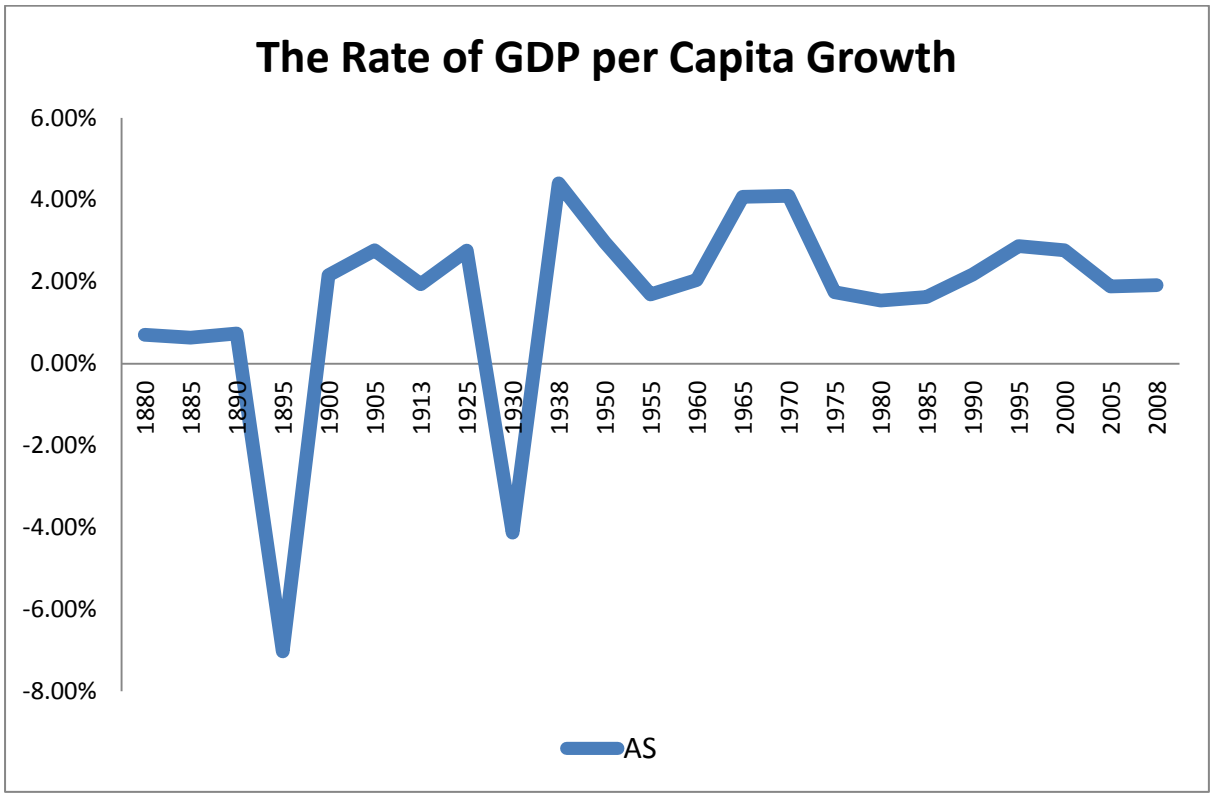
Total central government expenditure data is available for the UK from 1880 to 2003 with nominal figure presented in Pounds Sterling. Central government revenue data is recorded from 1880 to 1993 in Pounds Sterling. General government revenue in the United Kingdom as a percentage of GDP is reported in five year intervals between 1880 and 1950. Annual data is available from 1950 to 2008. National accounts, measured as GDP, are available in British Pounds from 1880 to 1998 and from 1999 to 2004 in US dollars. Trade data is available from 1880 to 1993 in Pounds Sterling with the remaining data from 1994 to 2005 reported in US dollars. Primary school enrolment numbers are presented from 1880 to 1913, 1919 to 1937 and 1945 to 1998. Population numbers are observed twelve times between 1880 and 2008, in the years 1881, 1891, 1901, 1911, 1921, 1931, 1951, 1961, 1971, 1981, 1991 and 1999. Open railway line length is reported continuously from 1880 to 2003. Freight traffic on railways is recorded from 1880 to 1913 and from 1919 to 1998. Both periods are measured in metric tons. The percentage of the population above the voting age with voting rights is observed thirty-four times between 1880 and 2008. By 1880, voting rights are extended to all those over 21 years of age above a certain income, those with qualifications, freeholders and leaseholders with real estate of a certain rental value or householders with property of a certain rental value. Plural voting is used when certain criteria are met in different constituencies, with extra university seats to be elected by university graduates. The Electoral Reform Act in 1884 and 1885 reduces the standard of qualifications required to be

enfranchised. From 1918 to 1924 universal and almost equal suffrage is granted to all male citizens of 21 years and over and all for female citizens of 30 years and over that are wives of householders. Plural voting is restricted to a maximum of two votes per person. In 1928 suffrage is extended to men and women of 21 years and over. The years 1948 see the abolition of university seats and all plural voting. In 1969 the voting age is reduced to 18 years for all citizens. Polity IV measures are available from 1880 to 2010.

### 5.4.15 United States of America

US data for central government expenditure is available from 1880 to 1994 in US Dollars. US central government revenue is recorded from 1880 to 2005. General government revenue as a percentage of GDP is available from 1880 to 2008. National output, measured as GNP, is recorded from 1880 to 2005. No interpolation or extrapolation is used. The value of exports and imports at current prices is presented from 1880 to 2004. Enrolment in US primary schools is reported in the year 1880 and from 1890 to 1919 continuously. Data is presented ever second year from 1918 to 1968 and every year from 1970 to 2002. Census data is recorded fourteen times between 1880 and 2008. Data is broken down between whites and non-white in the years 1880, 1890, 1900, 1910, 1920, 1930, 1940, 1950, 1960, 1970, 1980 and 1990. Data for the entire population is reported in 1997 and 2002. Open railway line in kilometres is available from 1880 to 2004. Freight traffic in metric tons for the United States is presented from 1882 to 1890 and from 1899 to 1995. The extent of democratisation of the population is observed twenty-six times between 1880 and 2008. Polity IV measures of regime durability and POLCOMP are available from 1880 to 2008.

**APPENDIX 5.5**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-4.00%
-6.00%
-8.00%
1880
1885
1890
1895
1900
1905
1913
1925
1930
1938
1950
1955
1960
1965
1970
1975
1980
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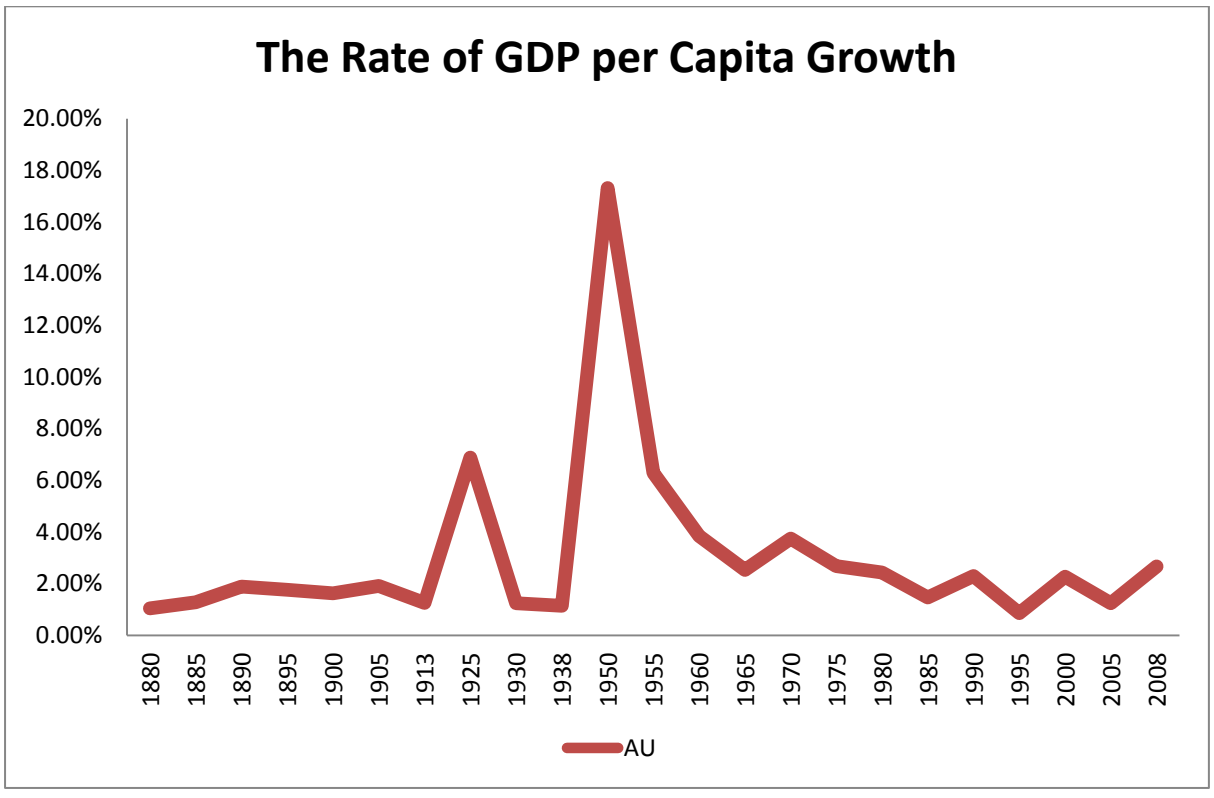
2008
AS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2.00%
0.00%
1880
1885
1890
1895
1900
1905
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2008
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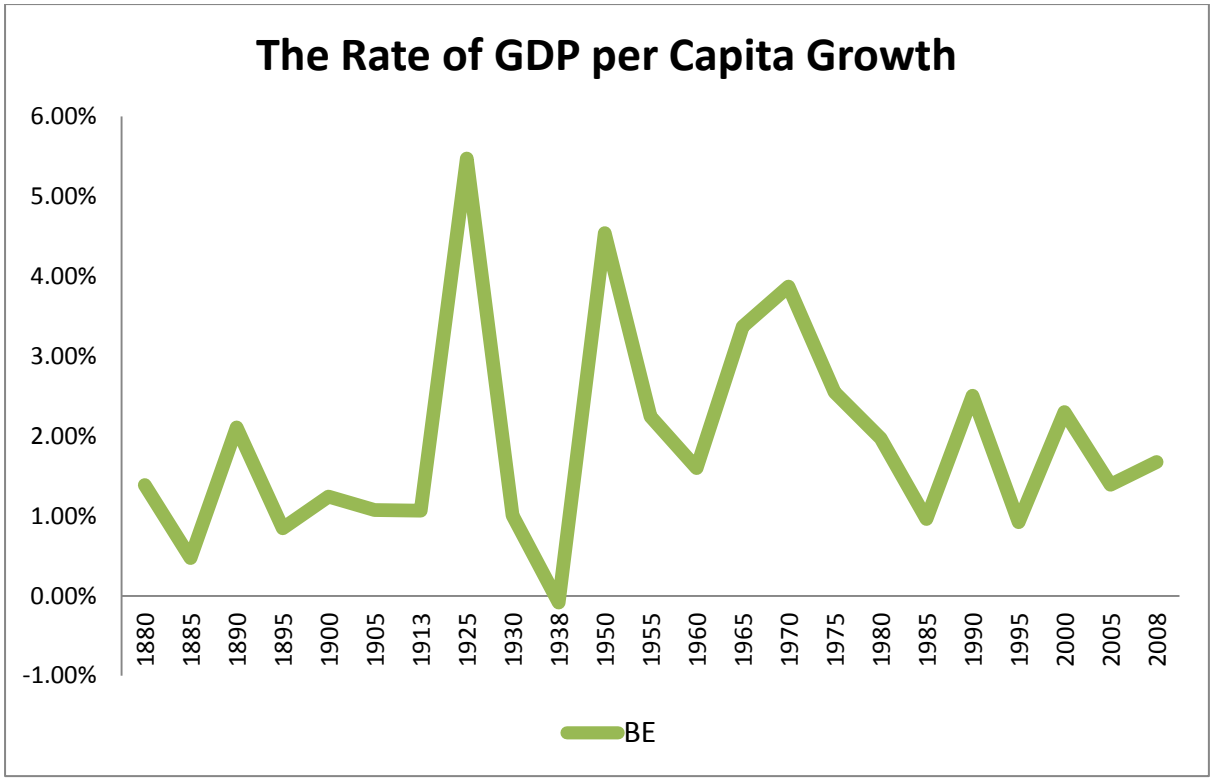
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3.00%
2.00%
1.00%
0.00%
-1.00%
1880
1885
1890
1895
1900
1905
1913
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2008
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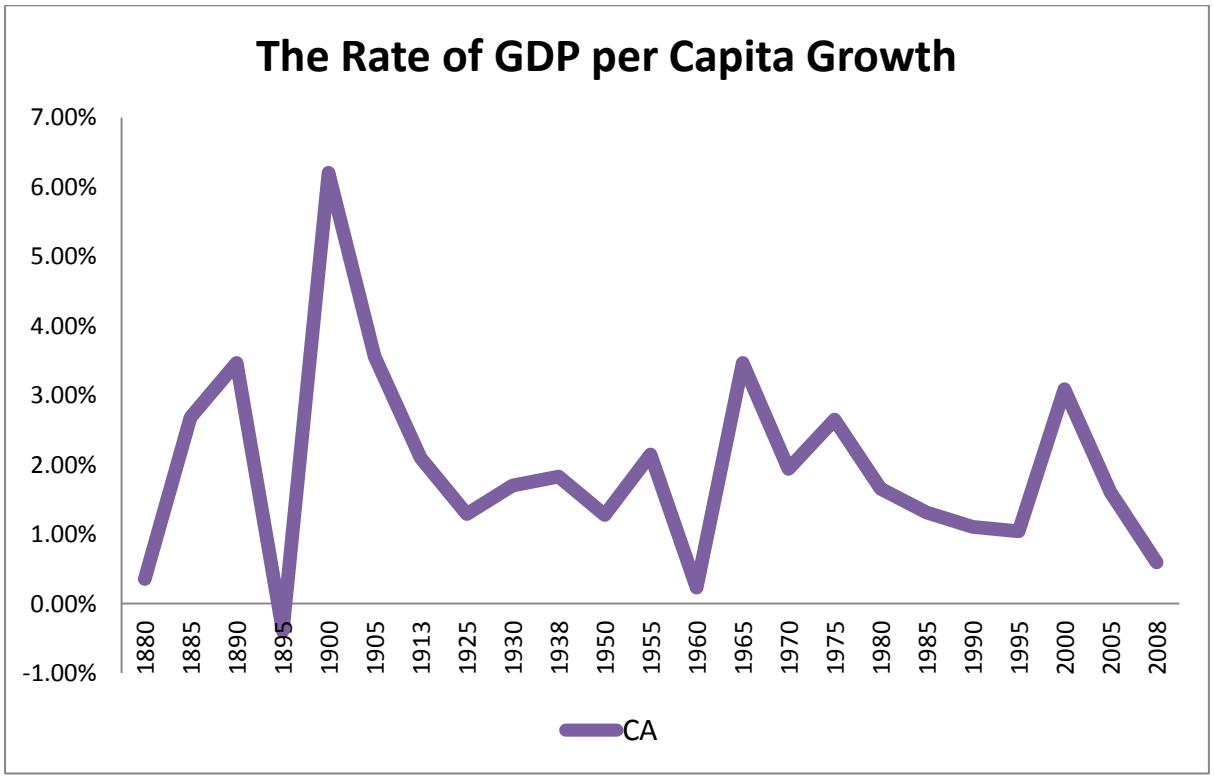
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1880
1885
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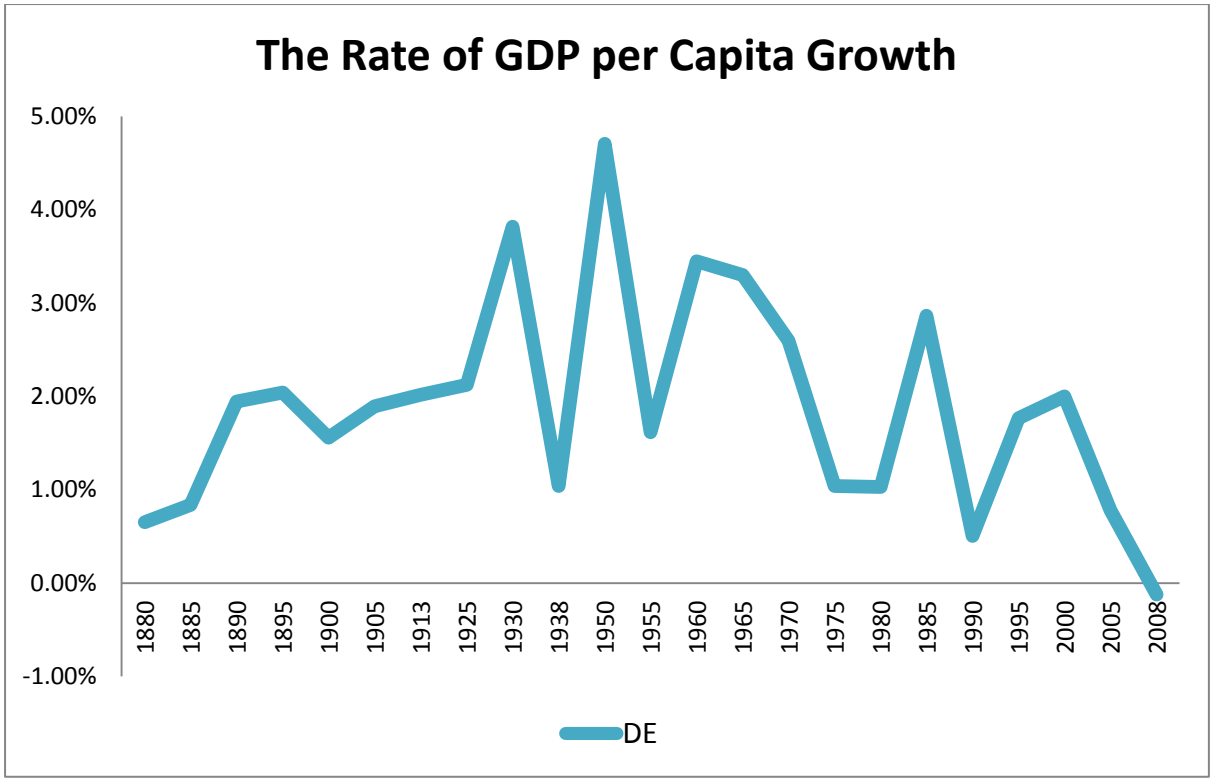
2005
2008
CA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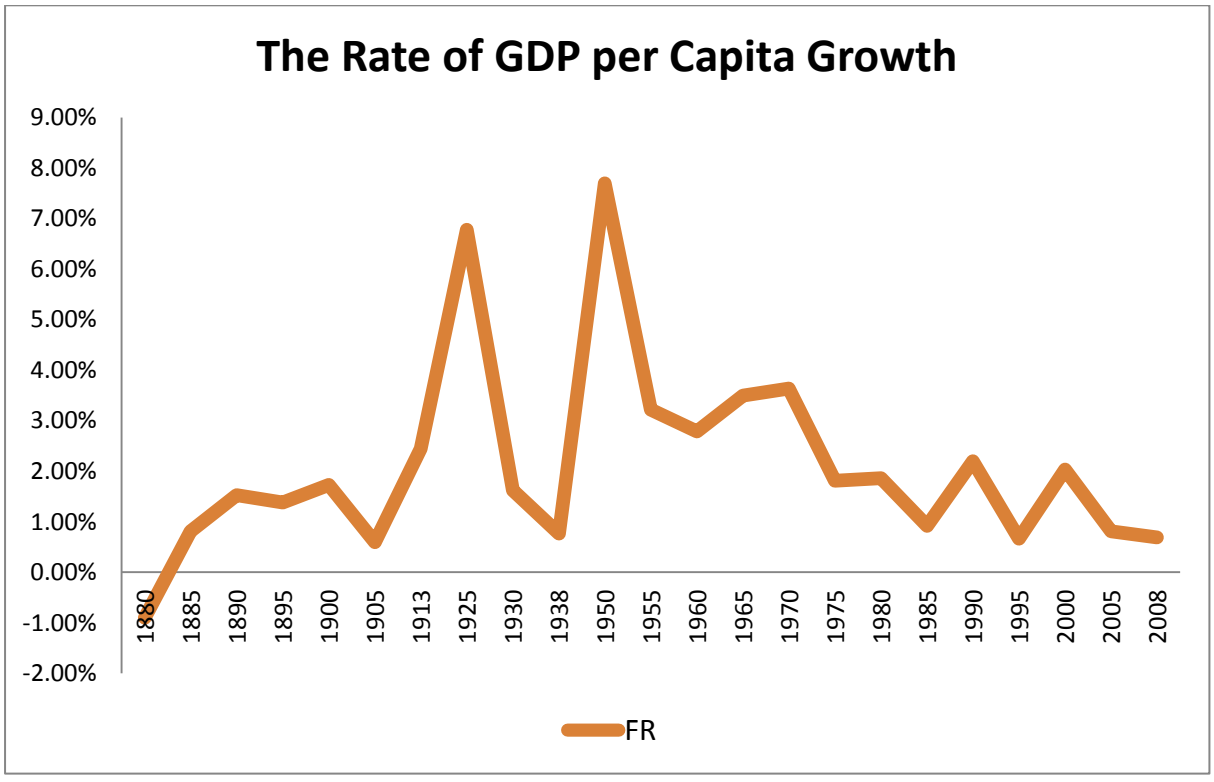
2000
2005
2008
DE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0.00%
-1.00%
-2.00%
1880
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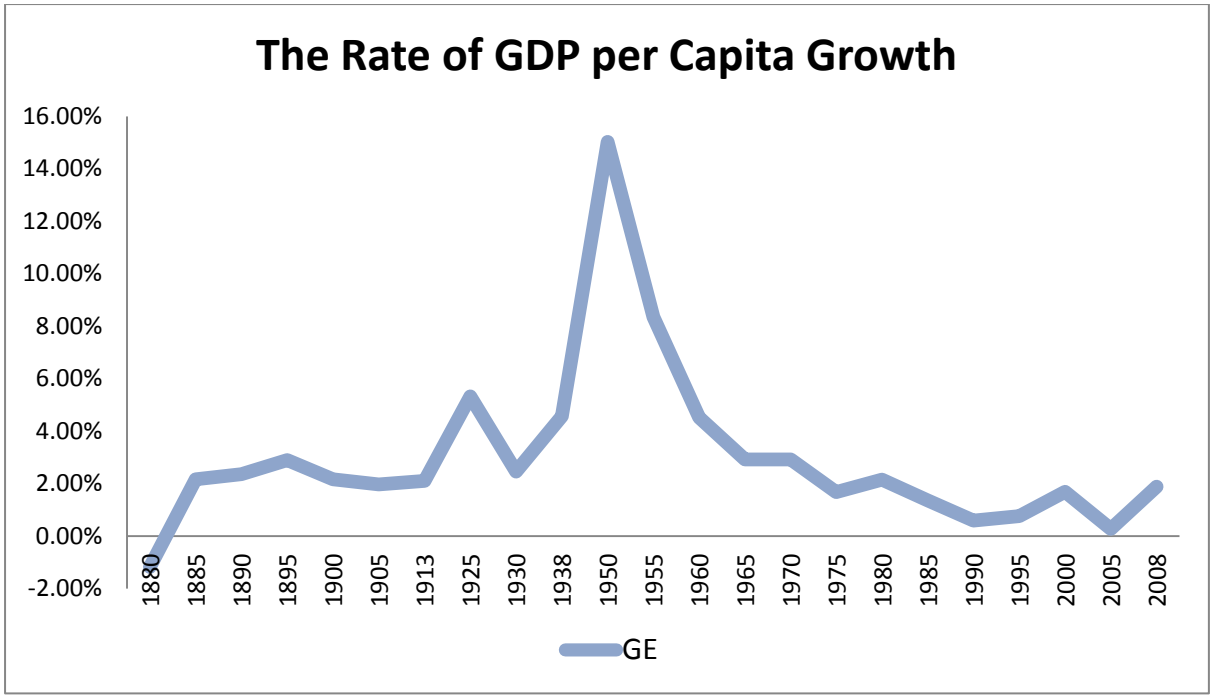
2008
FR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8.00%
6.00%
4.00%
2.00%
0.00%
-2.00%
1880
1885
1890
1895
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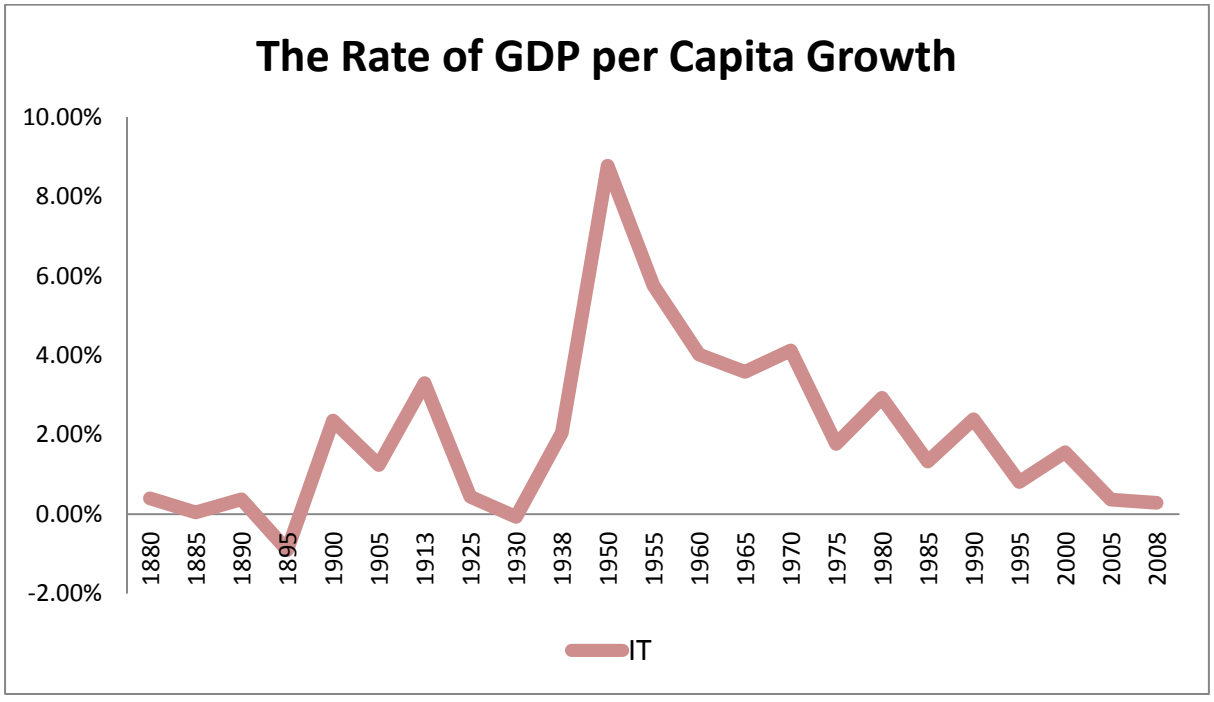
1990
1995
2000
2005
2008
GE


The Rate of GDP per Capita Growth
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
-2.00%
1880
1885
1890
1895
1900
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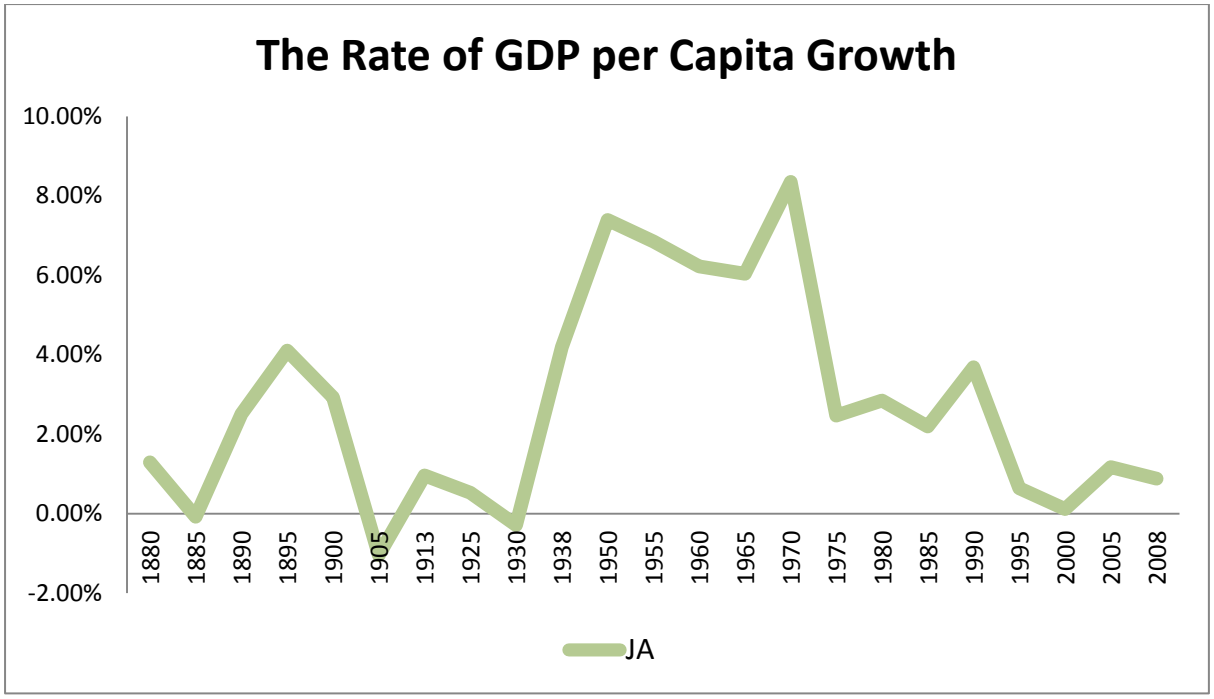
2005
2008
IT


The Rate of GDP per Capita Growth
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
-2.00%
1880
1885
1890
1895
1900
1905
1913
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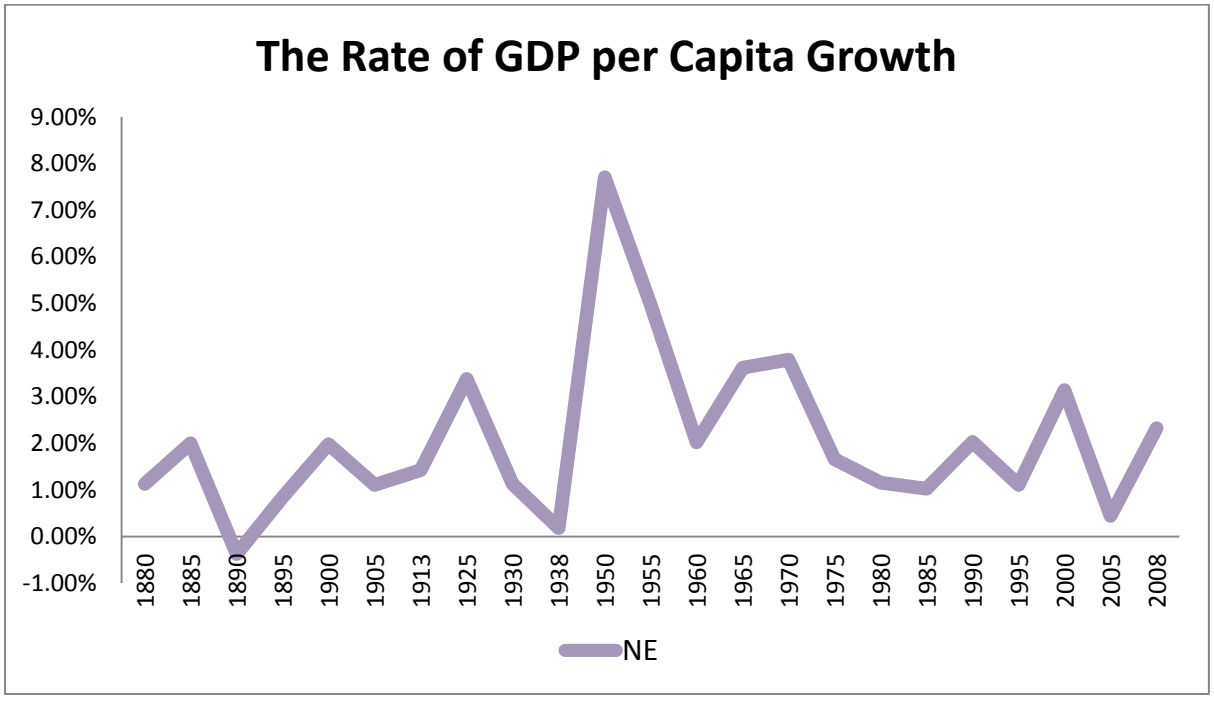
2008
JA


The Rate of GDP per Capita Growth
9.00%
8.00%
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
-1.00%
1880
1885
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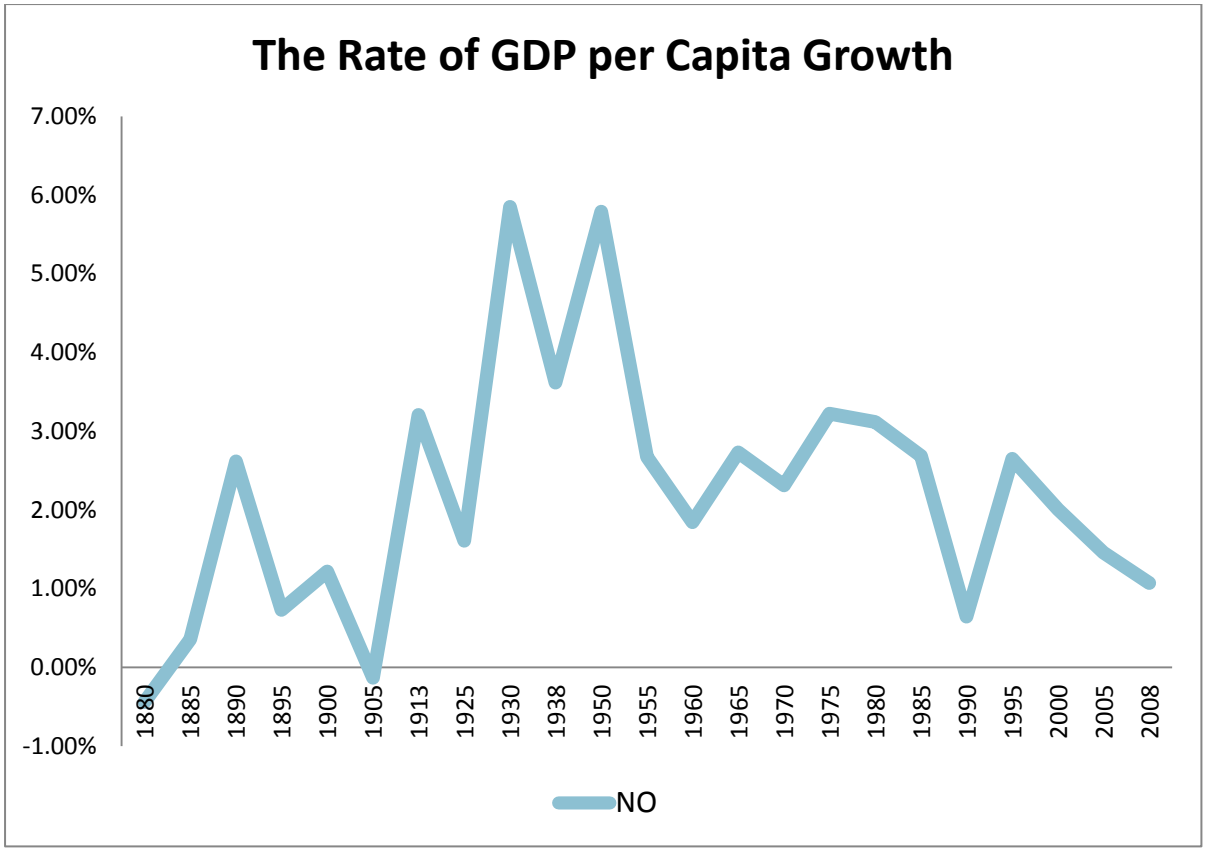
2005
2008
NE


The Rate of GDP per Capita Growth
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
-1.00%
1880
1885
1890
1895
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1960
1965
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1985
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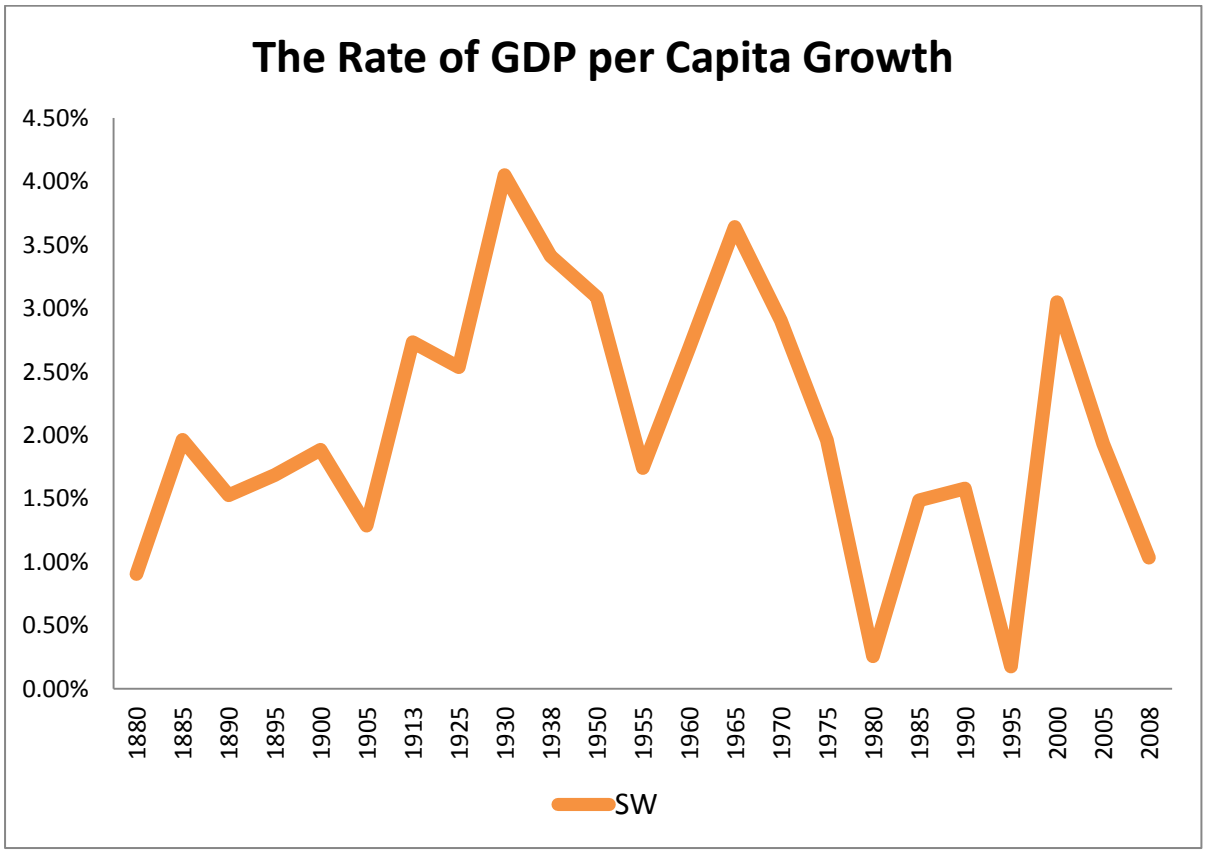
1995
2000
2005
2008
NO


The Rate of GDP per Capita Growth
4.50%
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
1880
1885
1890
1895
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1905
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1990
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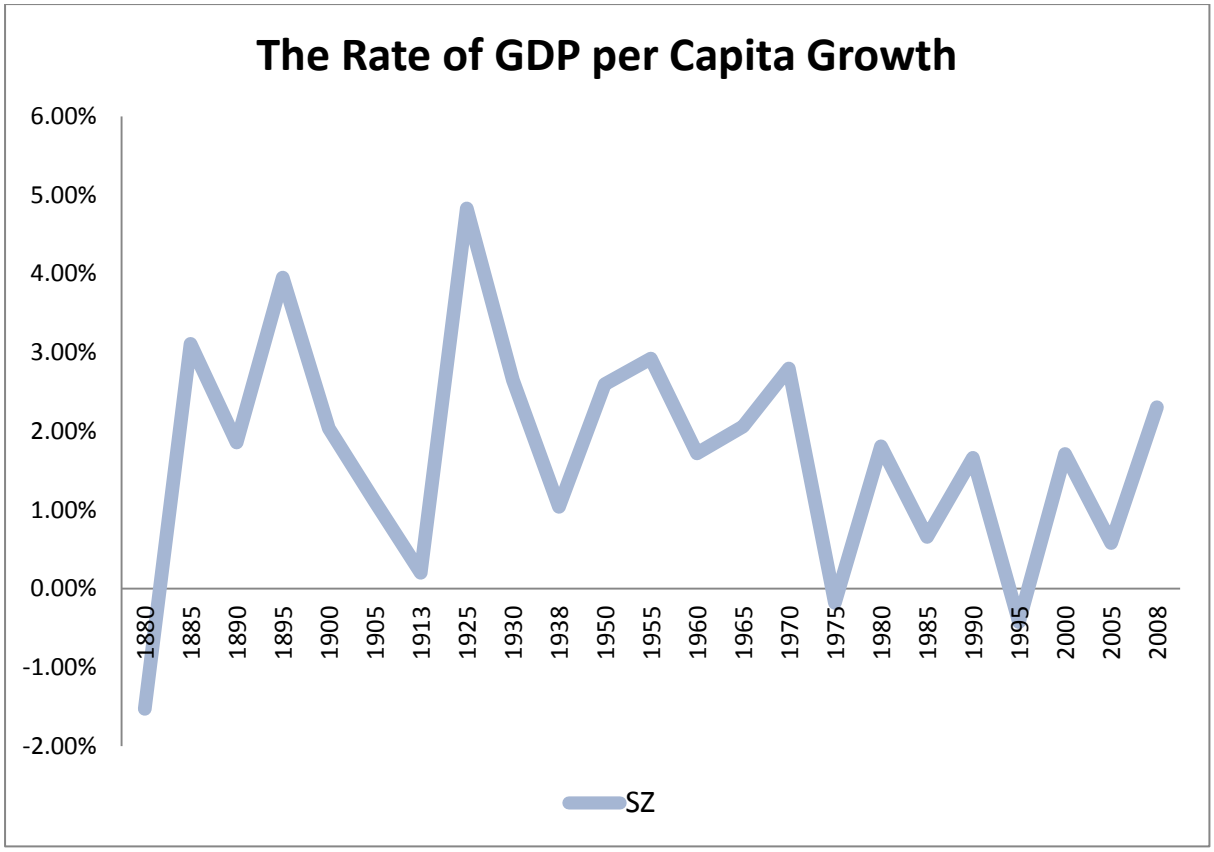
2000
2005
2008
SW


The Rate of GDP per Capita Growth
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
-1.00%
-2.00%
1880
1885
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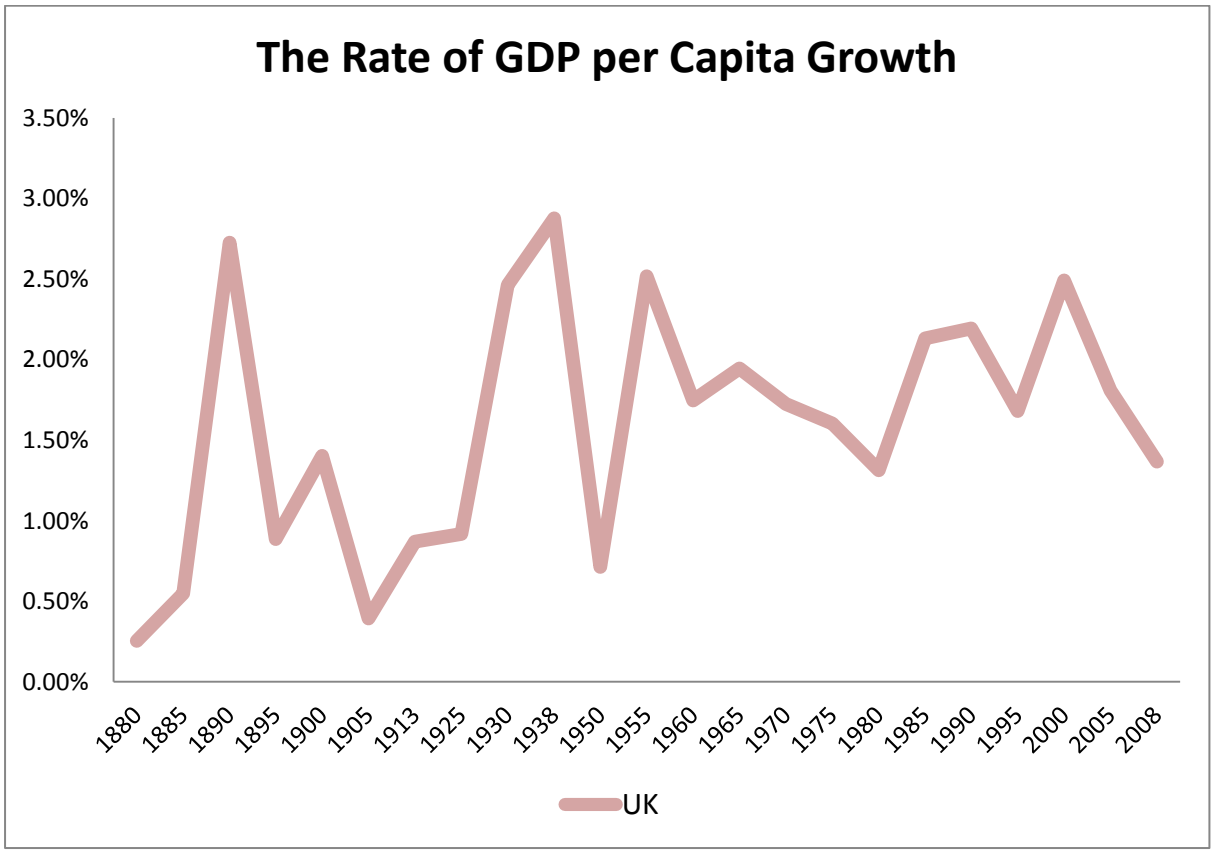
2005
2008
SZ


The Rate of GDP per Capita Growth
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
1880
1885
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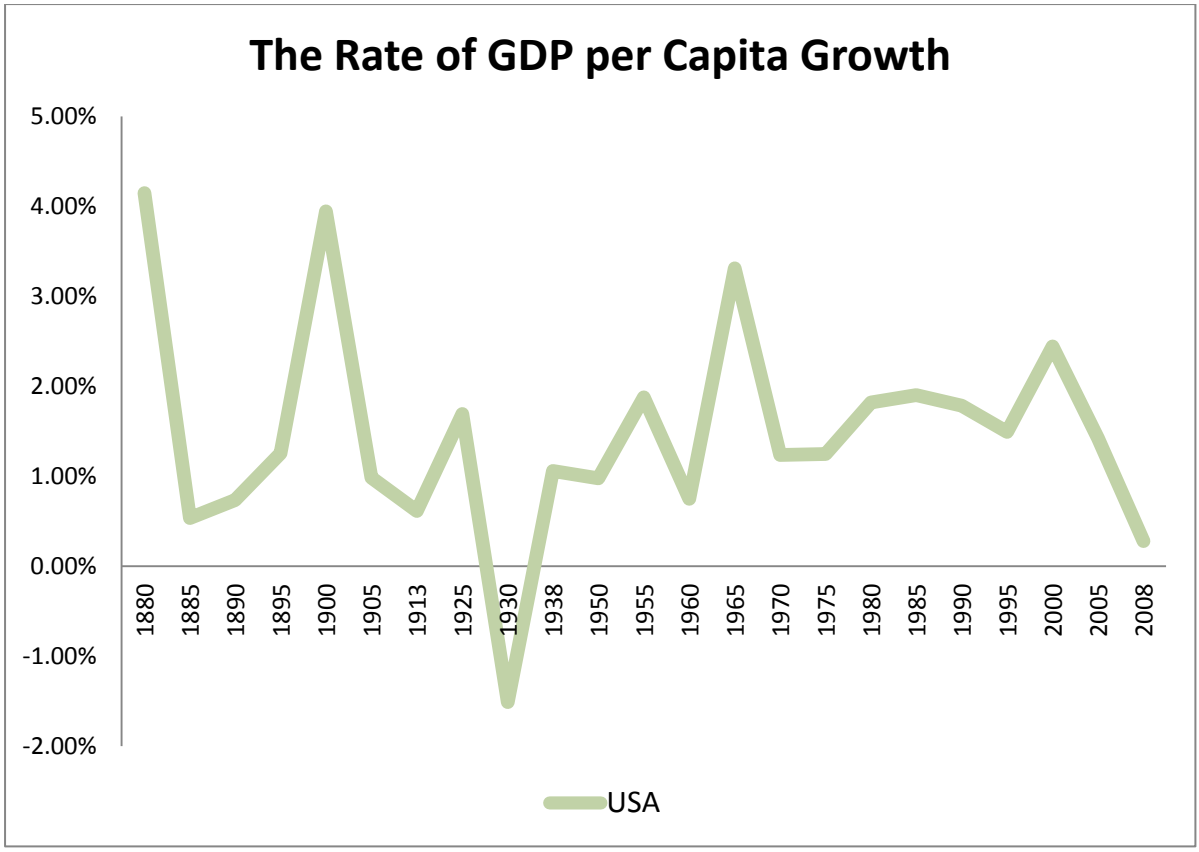
1985
1990
1995
2000
2005
2008
UK


The Rate of GDP per Capita Growth
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
-1.00%
-2.00%
1880
1885
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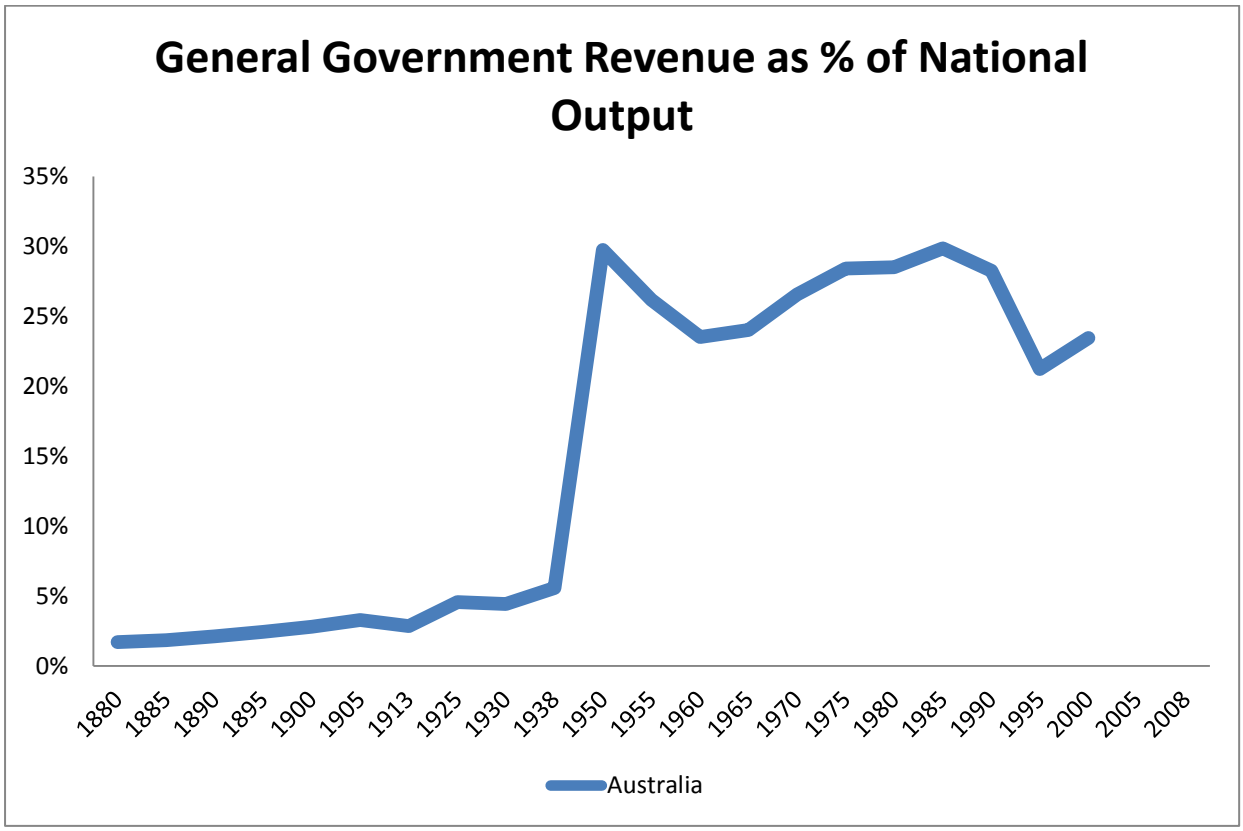
2005
2008
USA

## APPENDIX 5.6


General Government Revenue as % of National Output
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
1900
1905
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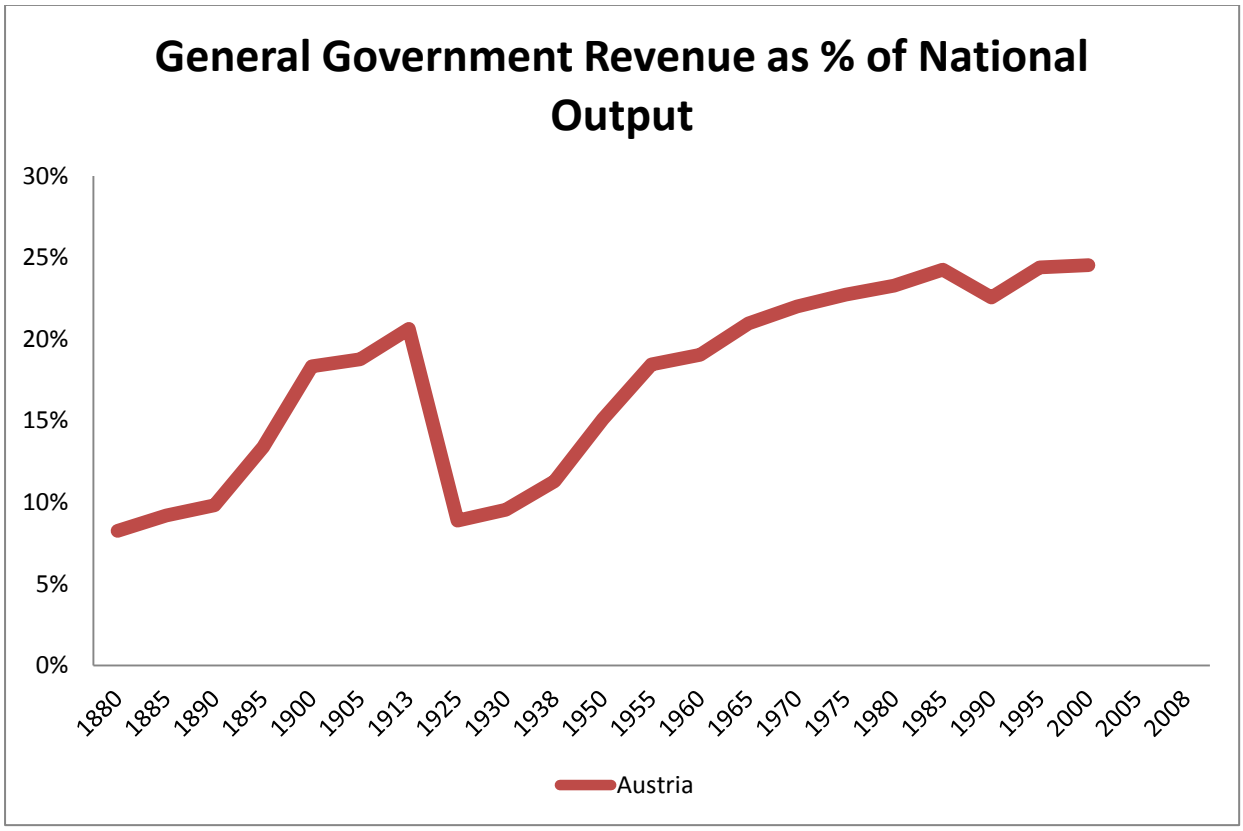
1995
2000
2005
2008
Australia


General Government Revenue as % of National Output
30%
25%
20%
15%
10%
5%
0%
1880
1885
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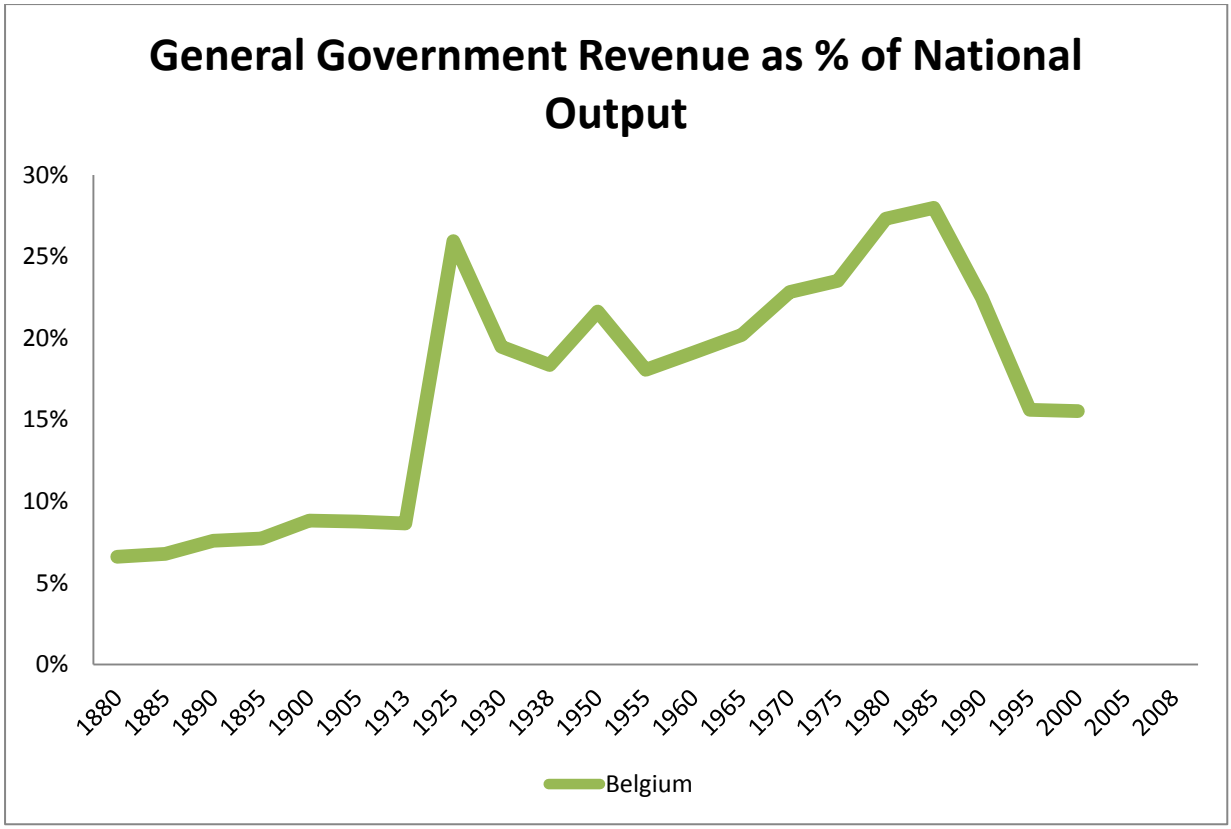
2000
2005
2008
Austria


General Government Revenue as % of National Output
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
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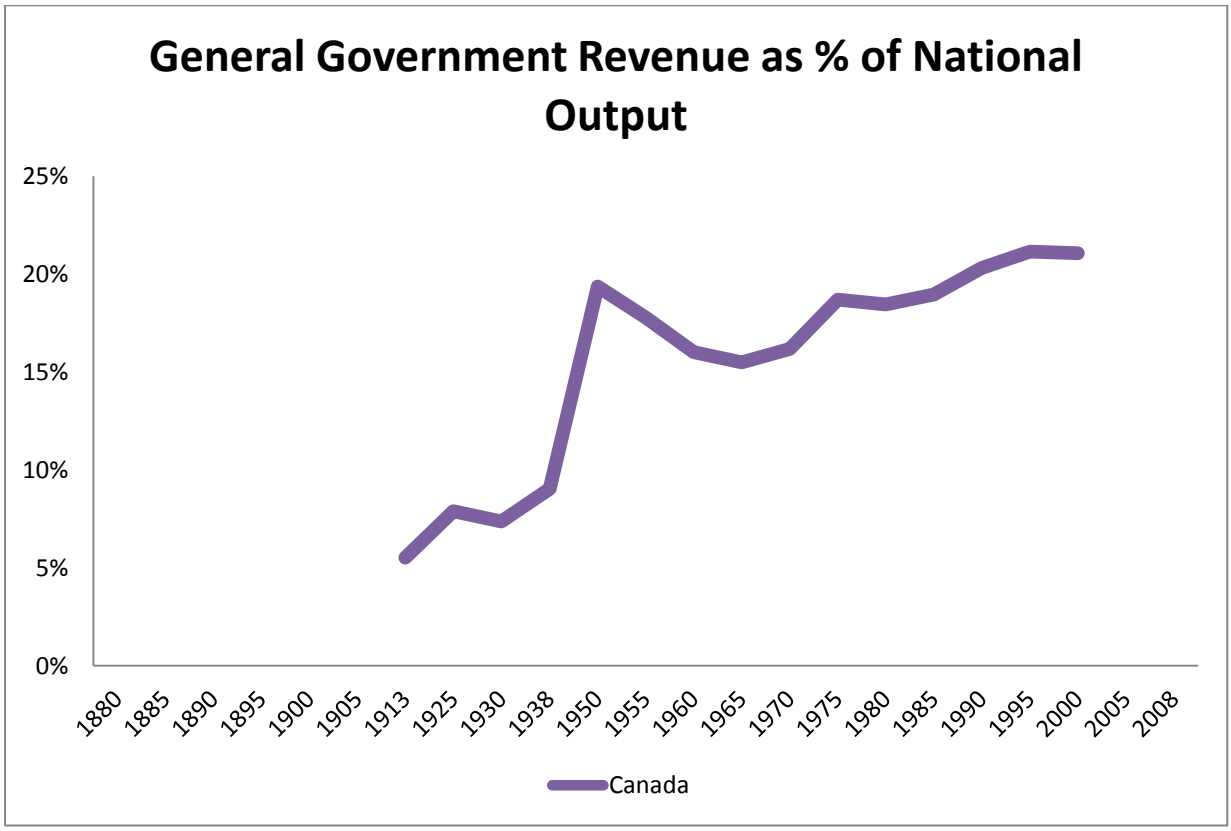
2005
2008
Belgium


General Government Revenue as % of National Output
25%
20%
15%
10%
5%
0%
1880
1885
1890
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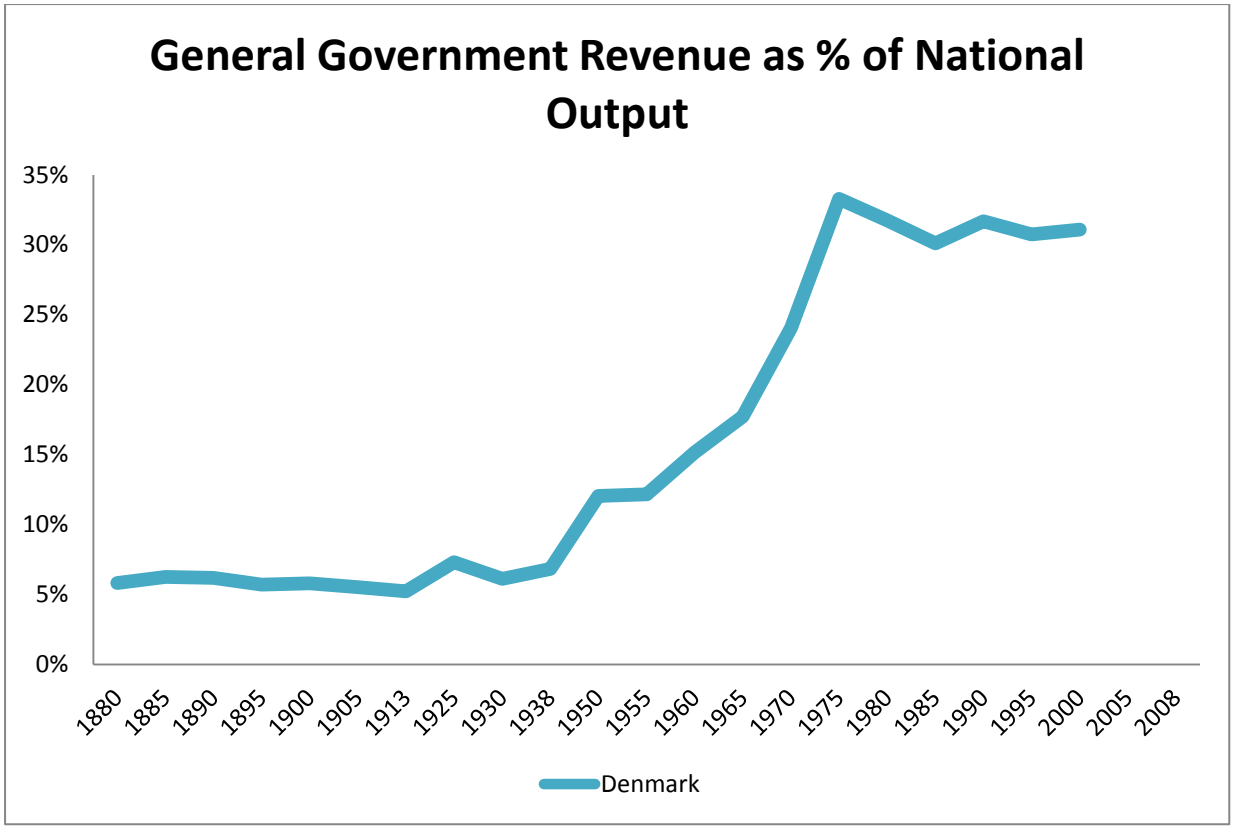
2000
2005
2008
Canada


General Government Revenue as % of National Output
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
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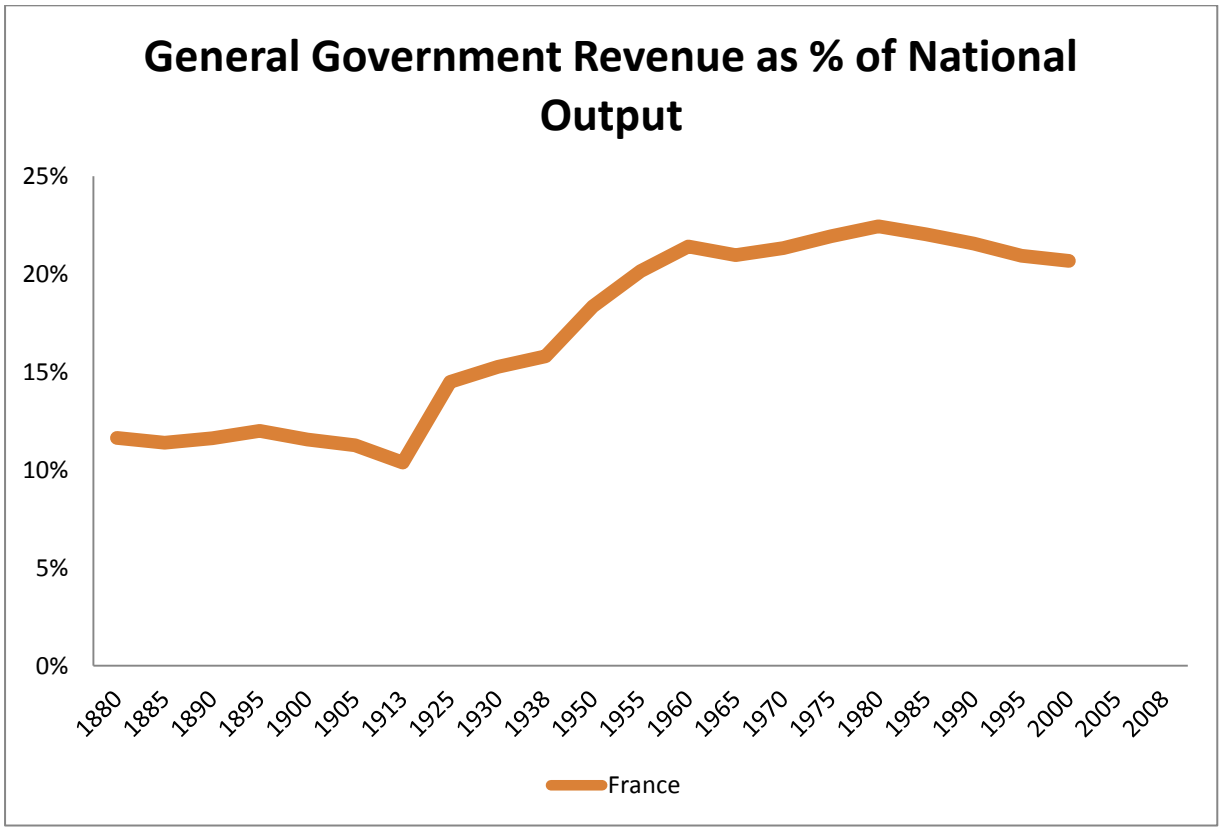
2008
Denmark


General Government Revenue as % of National Output
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
1900
1905
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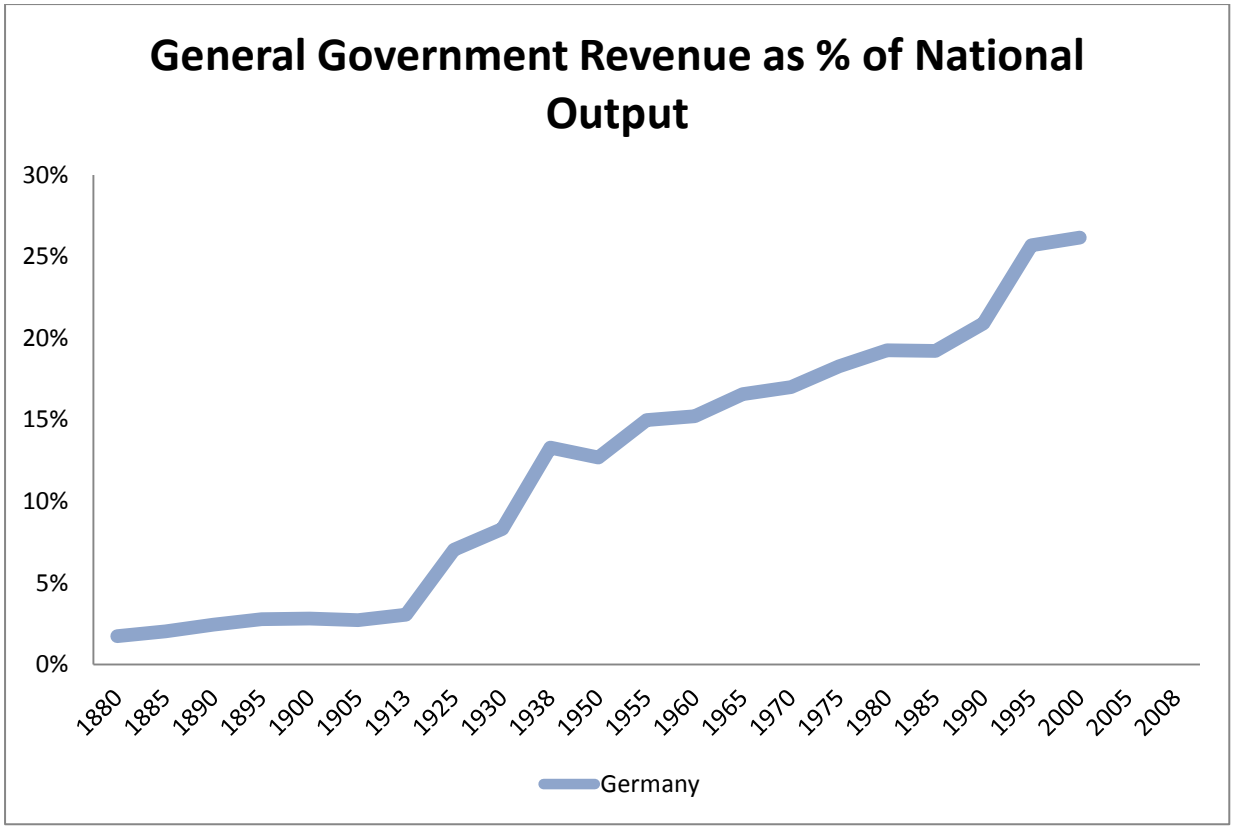
1995
2000
2005
2008
France


General Government Revenue as % of National Output
30%
25%
20%
15%
10%
5%
0%
1880
1885
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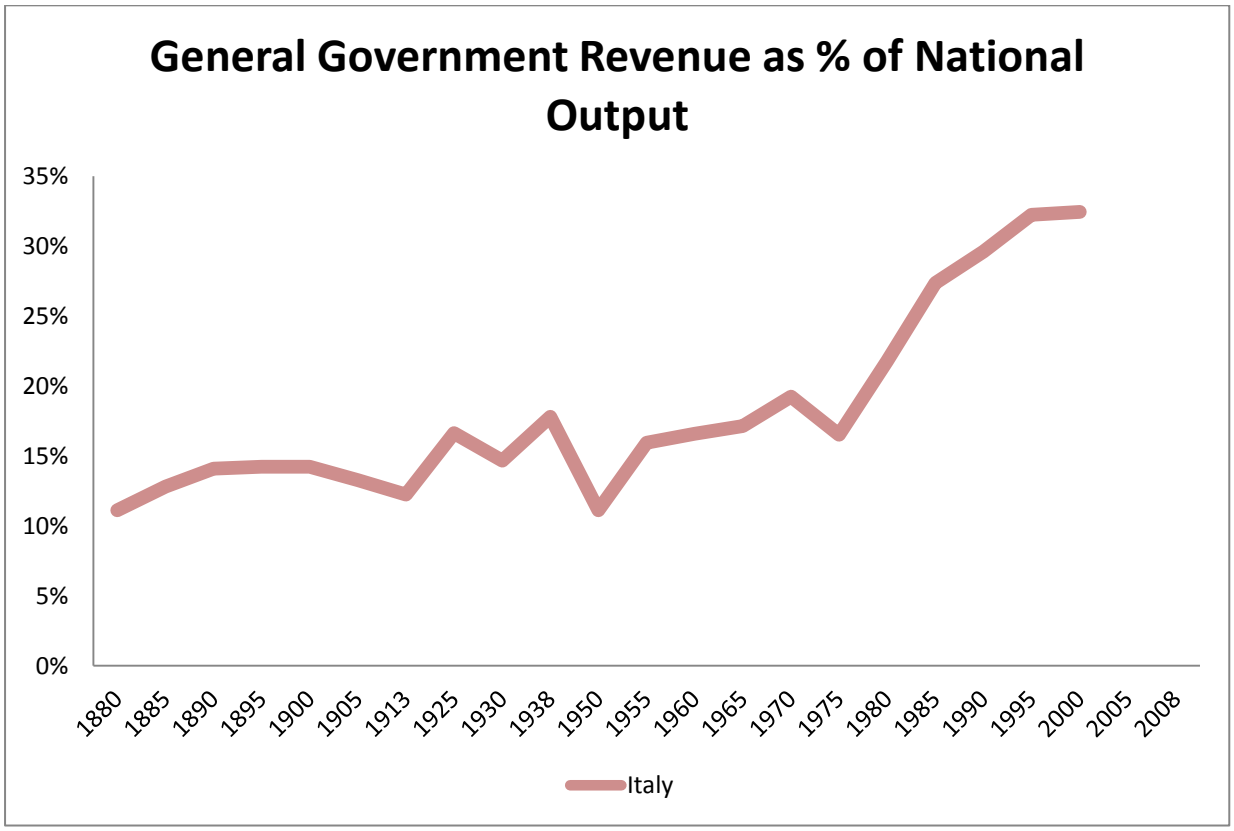
1995
2000
2005
2008
Germany


General Government Revenue as % of National Output
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
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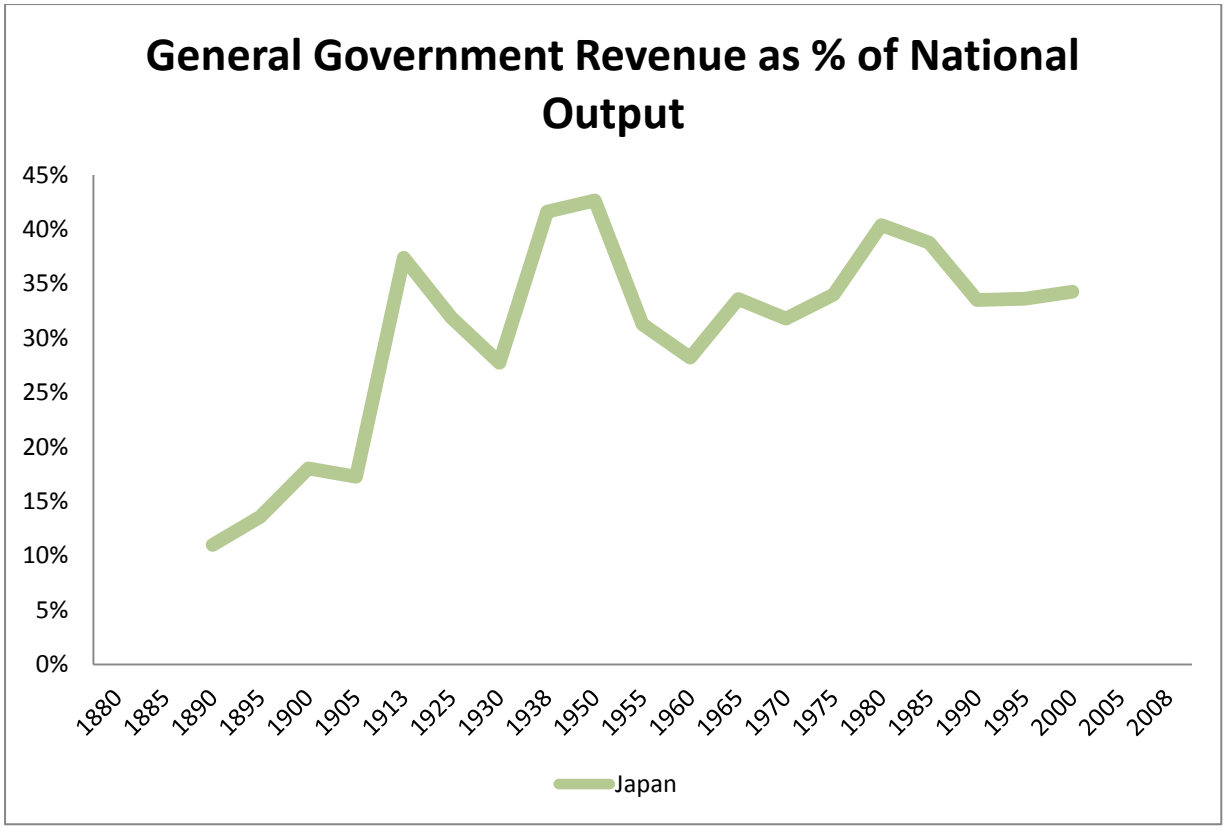
2005
2008
Italy


General Government Revenue as % of National Output
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
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1905
1913
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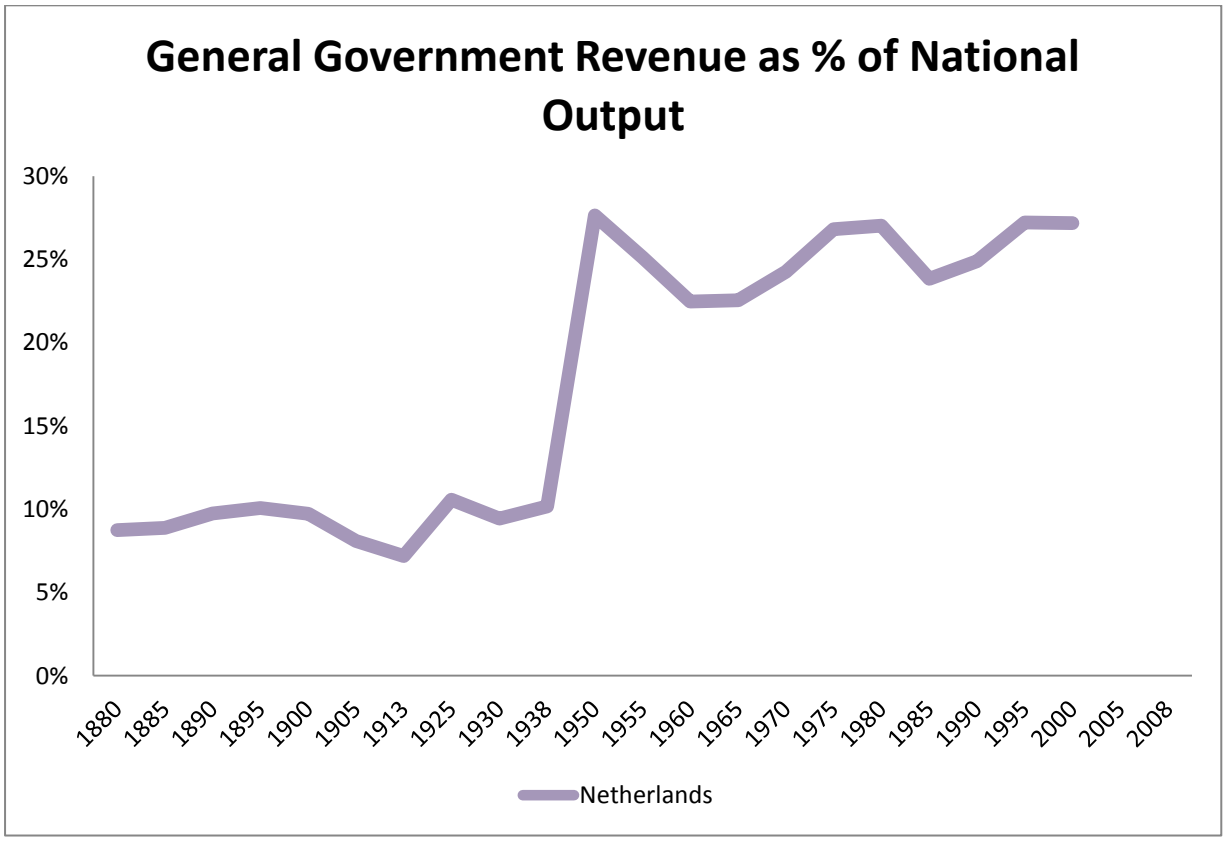
1990
1995
2000
2005
2008
Japan


General Government Revenue as % of National Output
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
1900
1905
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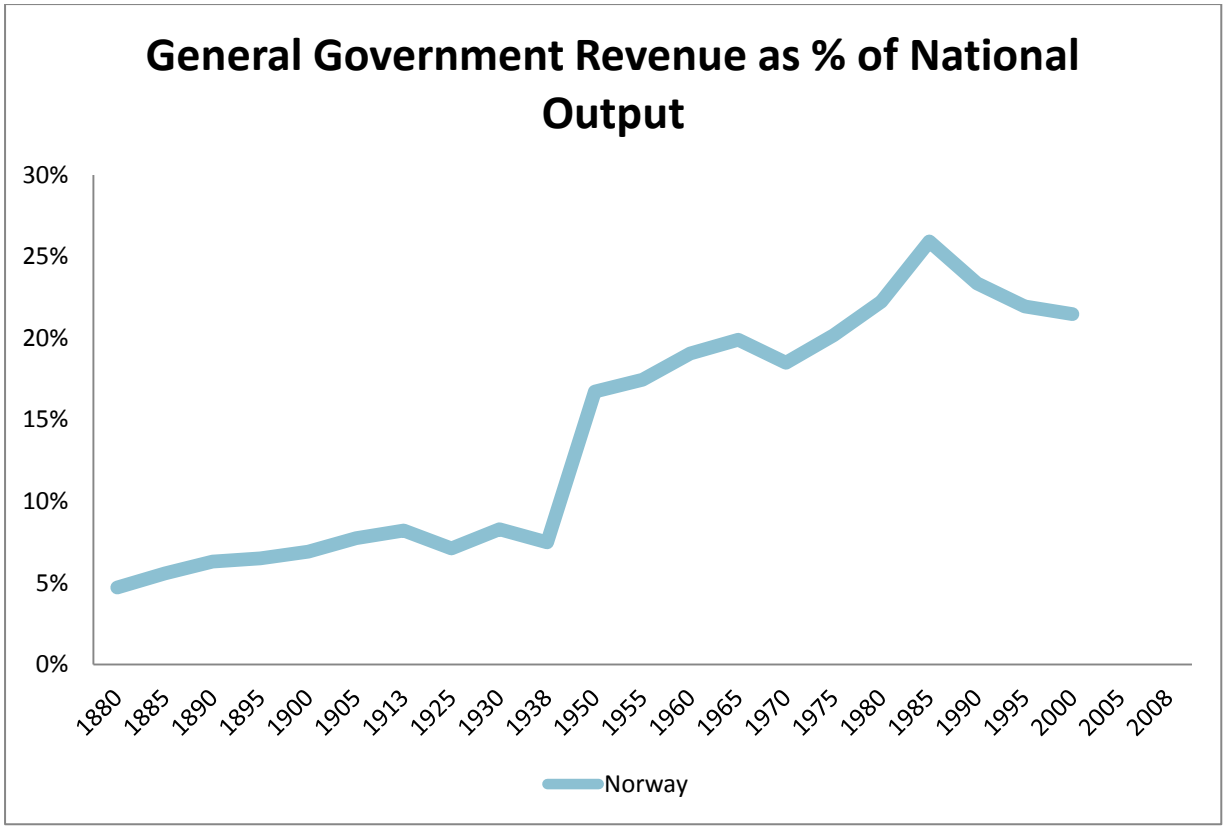
1985
1990
1995
2000
2005
2008
Netherlands


General Government Revenue as % of National Output
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
1900
1905
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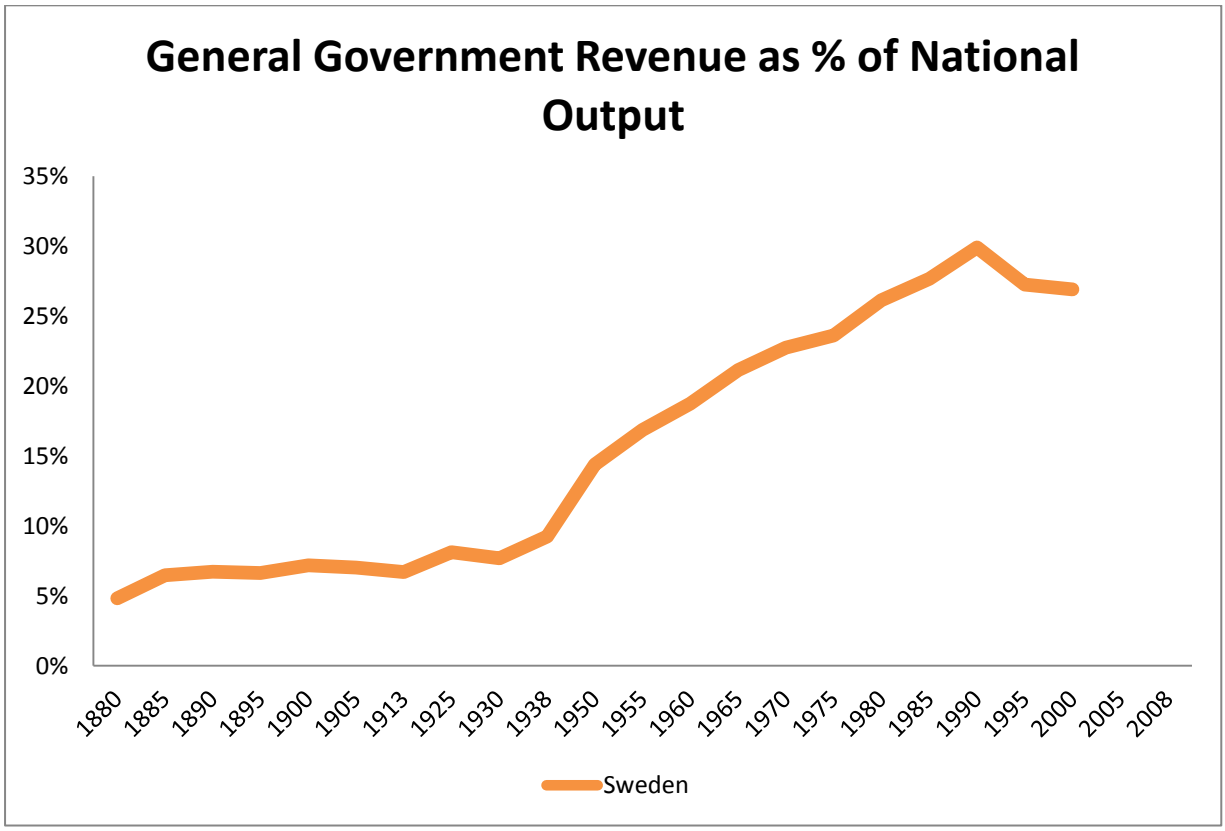
2000
2005
2008
Norway


General Government Revenue as % of National Output
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
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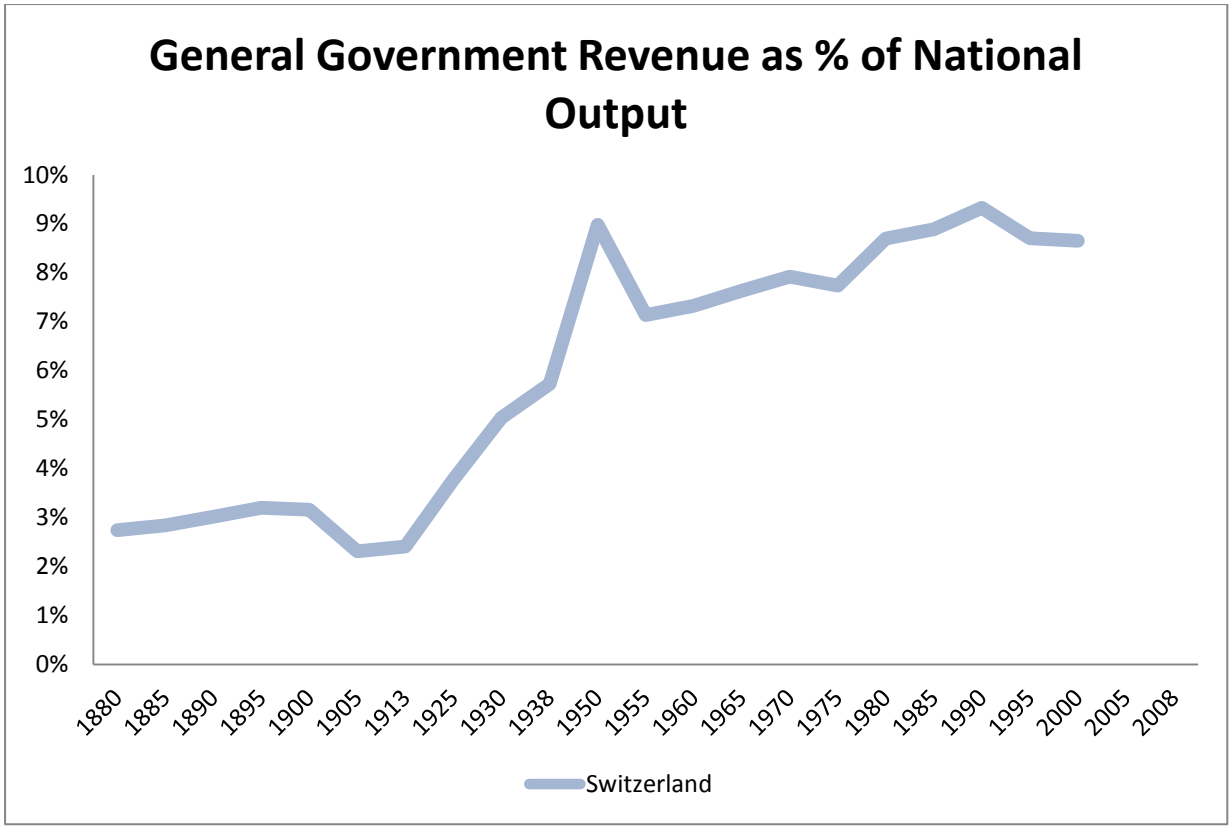
1990
1995
2000
2005
2008
Sweden


General Government Revenue as % of National Output
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
1880
1885
1890
1895
1900
1905
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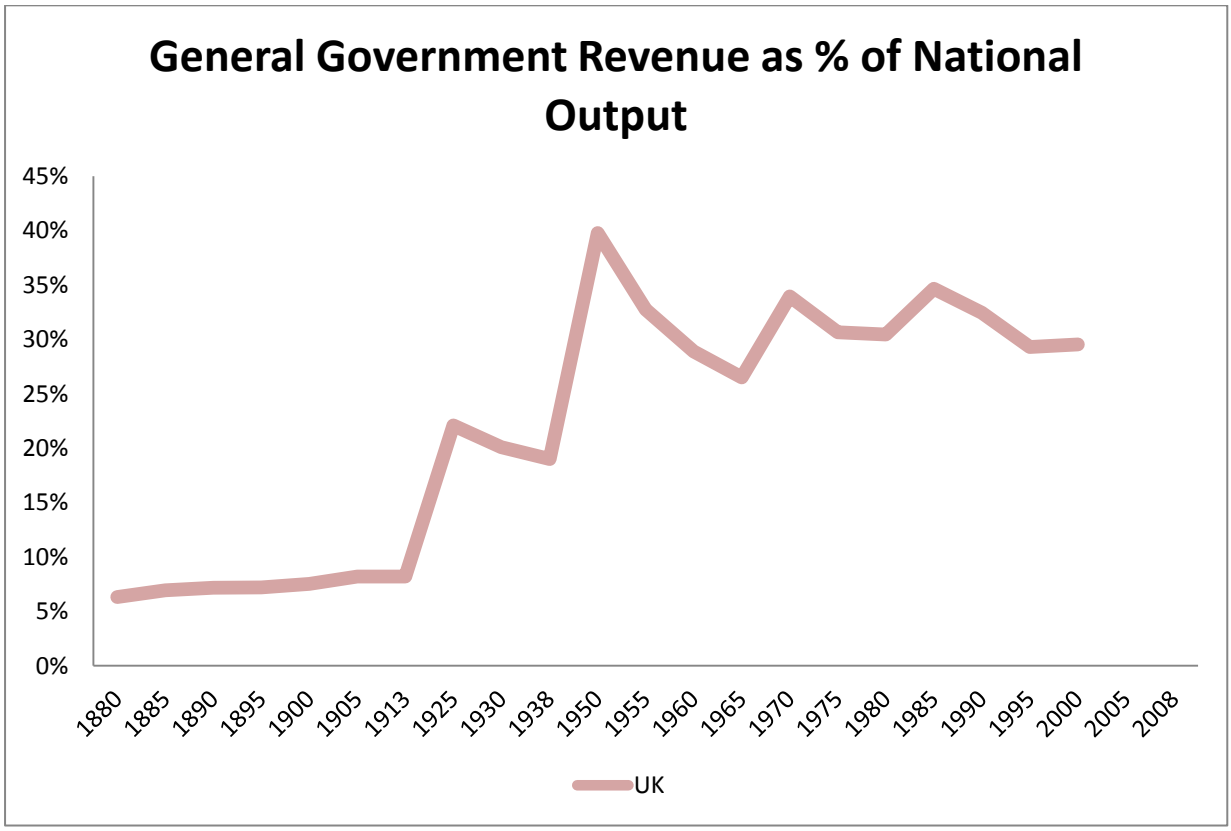
2000
2005
2008
Switzerland


General Government Revenue as % of National Output
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
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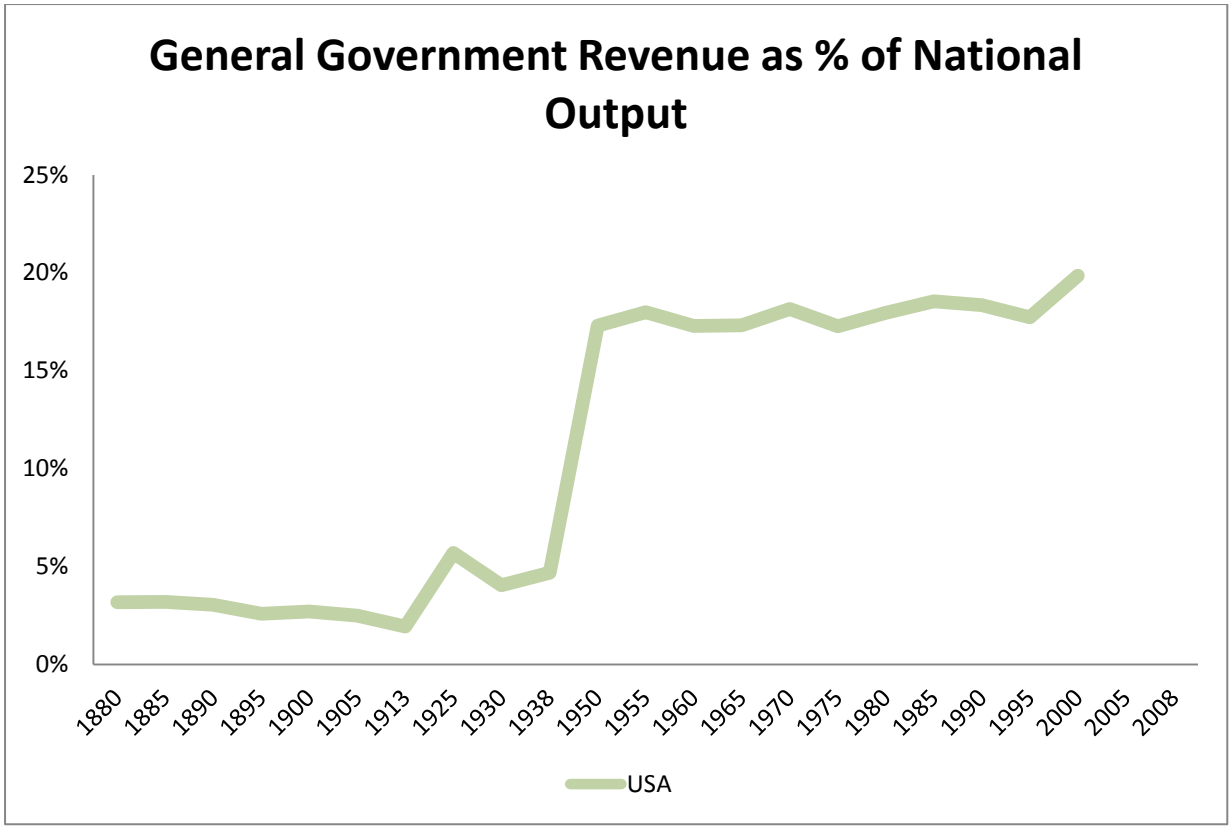
1995
2000
2005
2008
UK


General Government Revenue as % of National Output
25%
20%
15%
10%
5%
0%
1880
1885
1890
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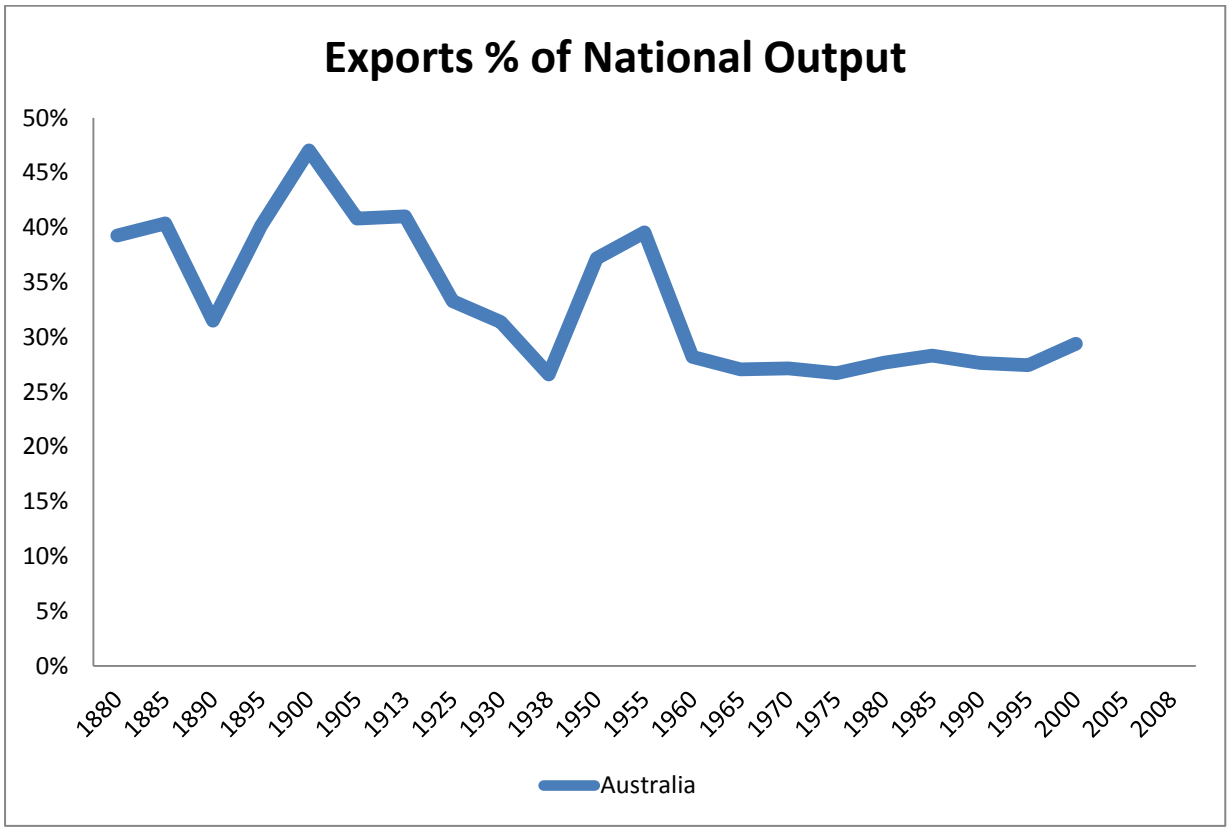
2005
2008
USA

## APPENDIX 5.7


Exports % of National Output
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
1885
1890
1895
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1905
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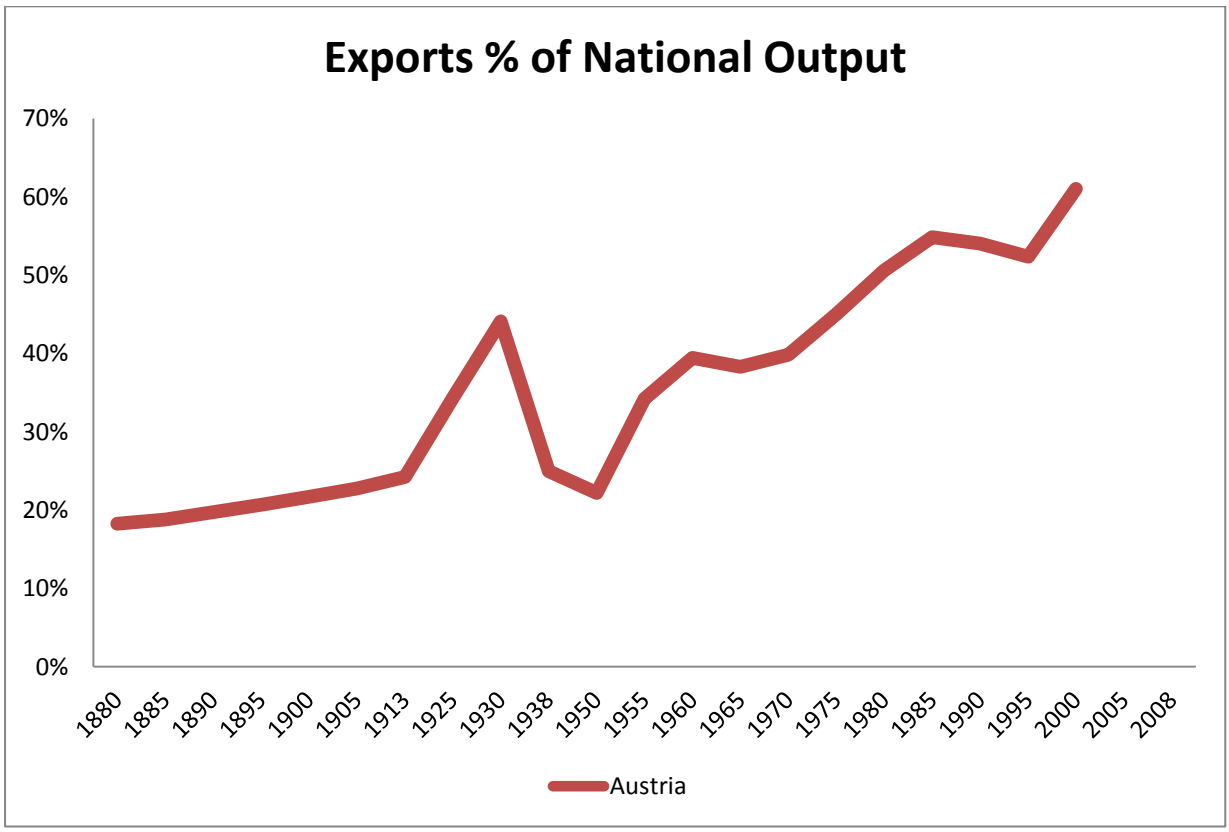
2000
2005
2008
Australia


Exports % of National Output
70%
60%
50%
40%
30%
20%
10%
0%
1880
1885
1890
1895
1900
1905
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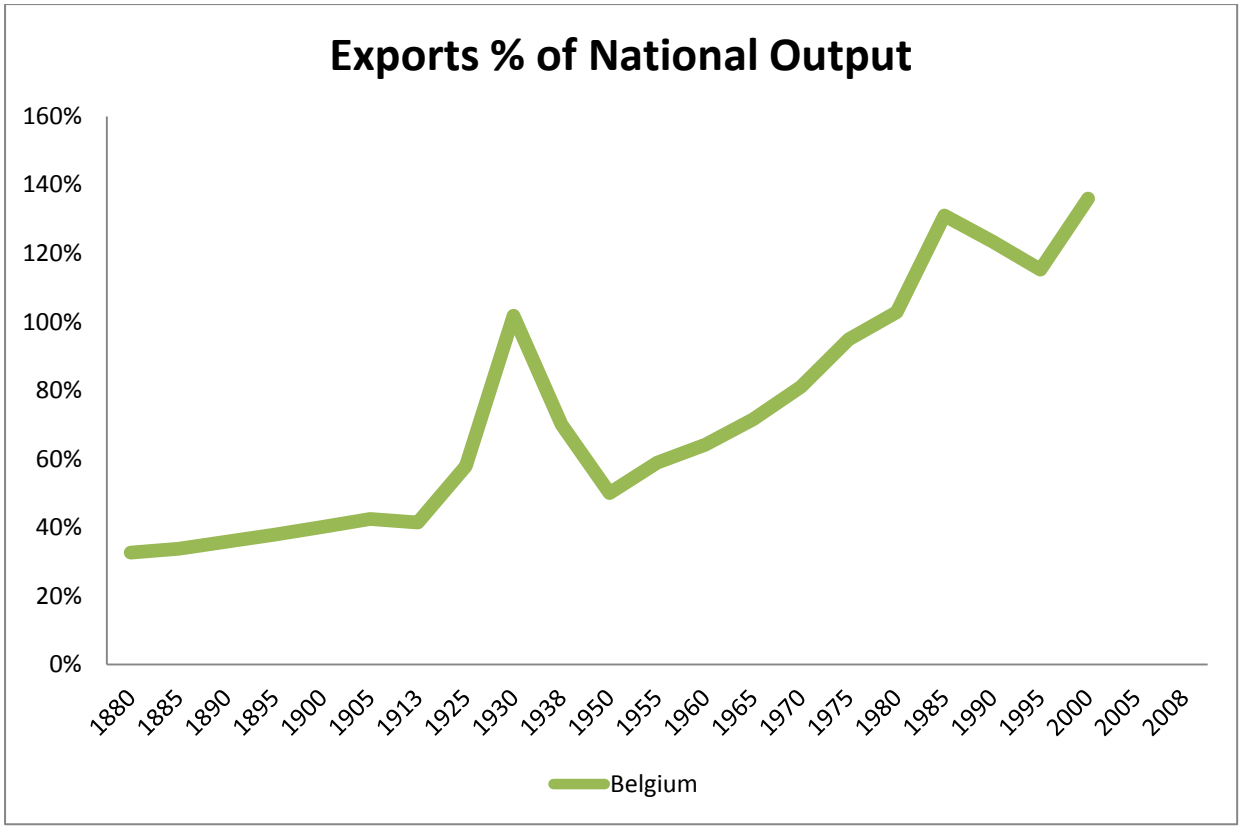
2000
2005
2008
Austria


Exports % of National Output
160%
140%
120%
100%
80%
60%
40%
20%
0%
1880
1885
1890
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1905
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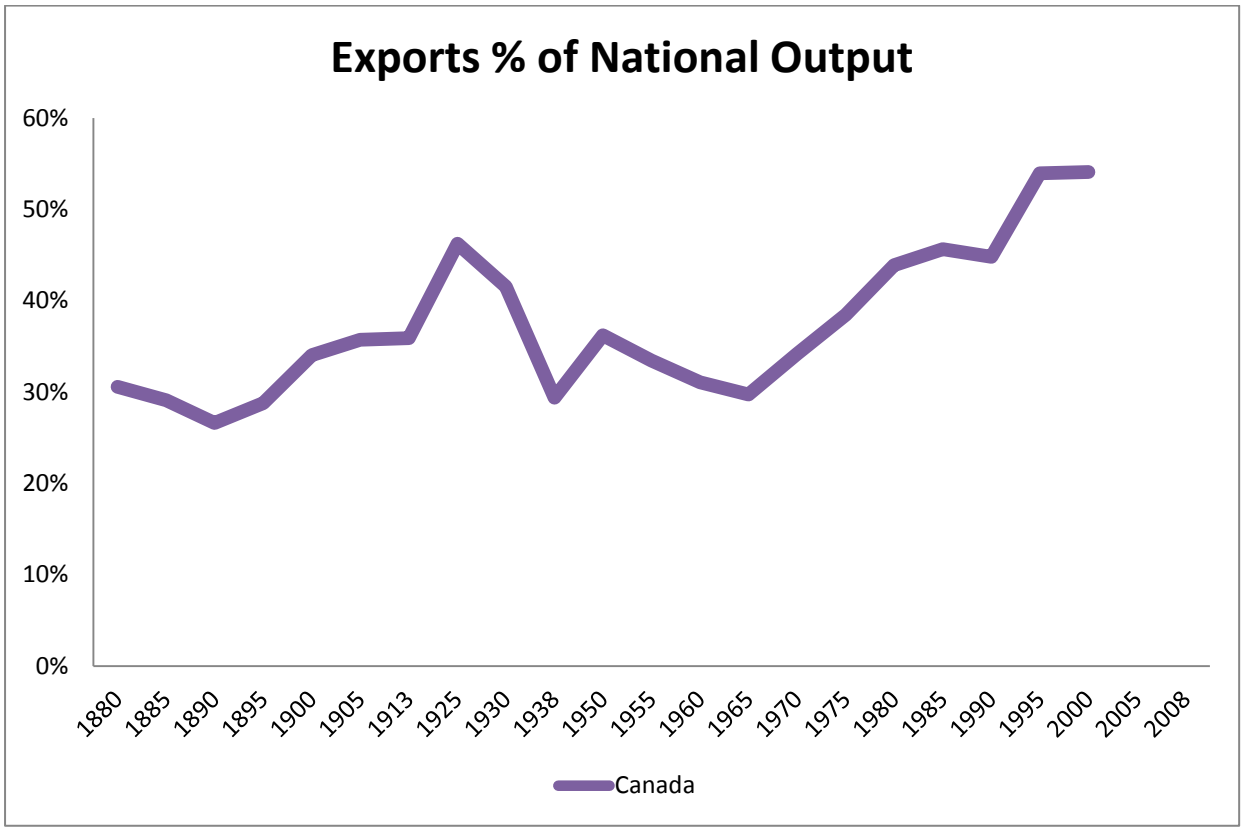
2000
2005
2008
Belgium


Exports % of National Output
60%
50%
40%
30%
20%
10%
0%
1880
1885
1890
1895
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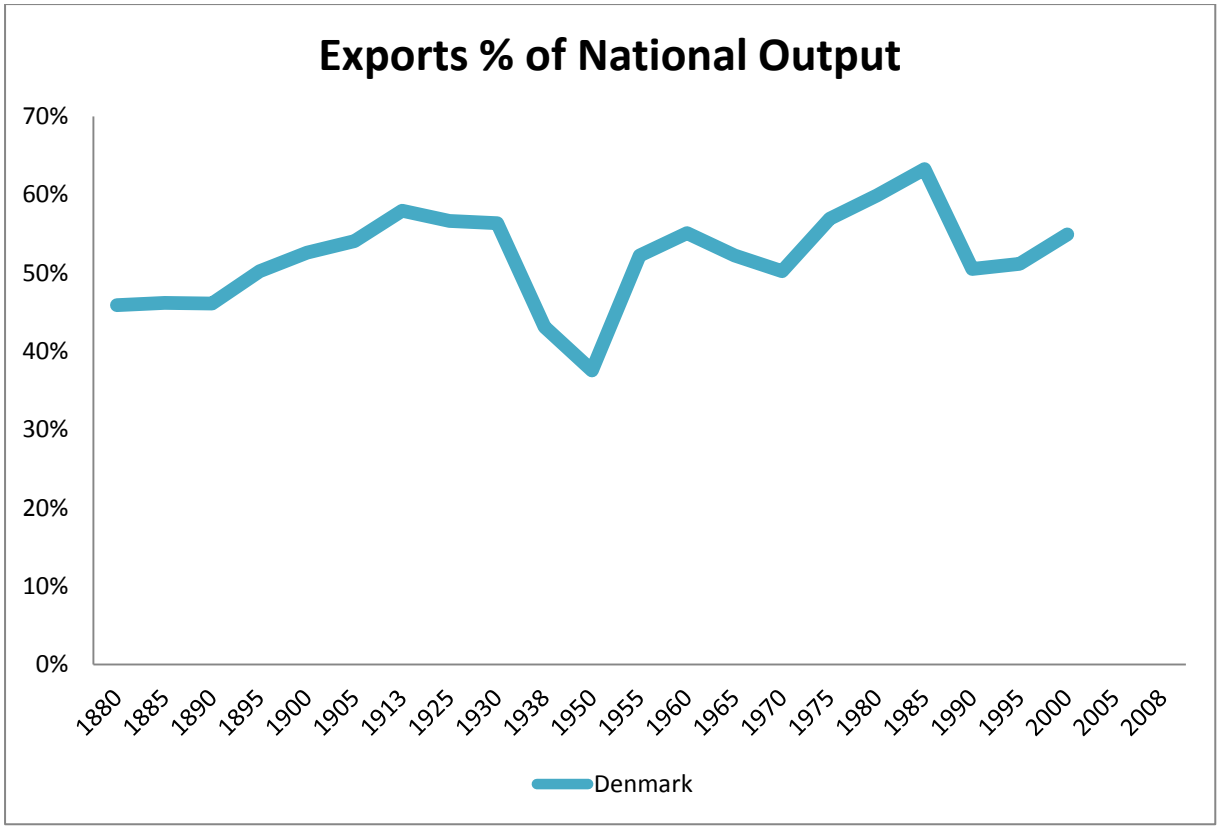
2000
2005
2008
Canada


Exports % of National Output
70%
60%
50%
40%
30%
20%
10%
0%
1880
1885
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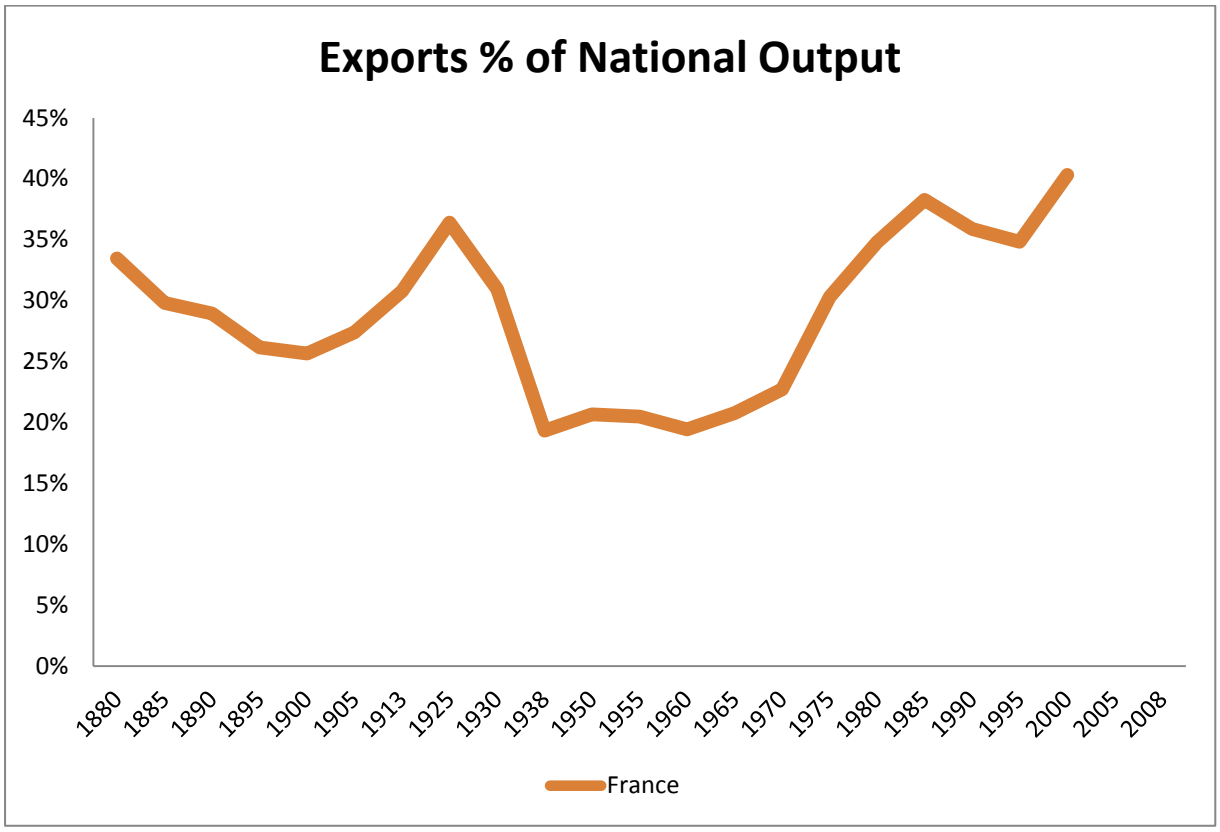
2005
2008
Denmark


Exports % of National Output
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
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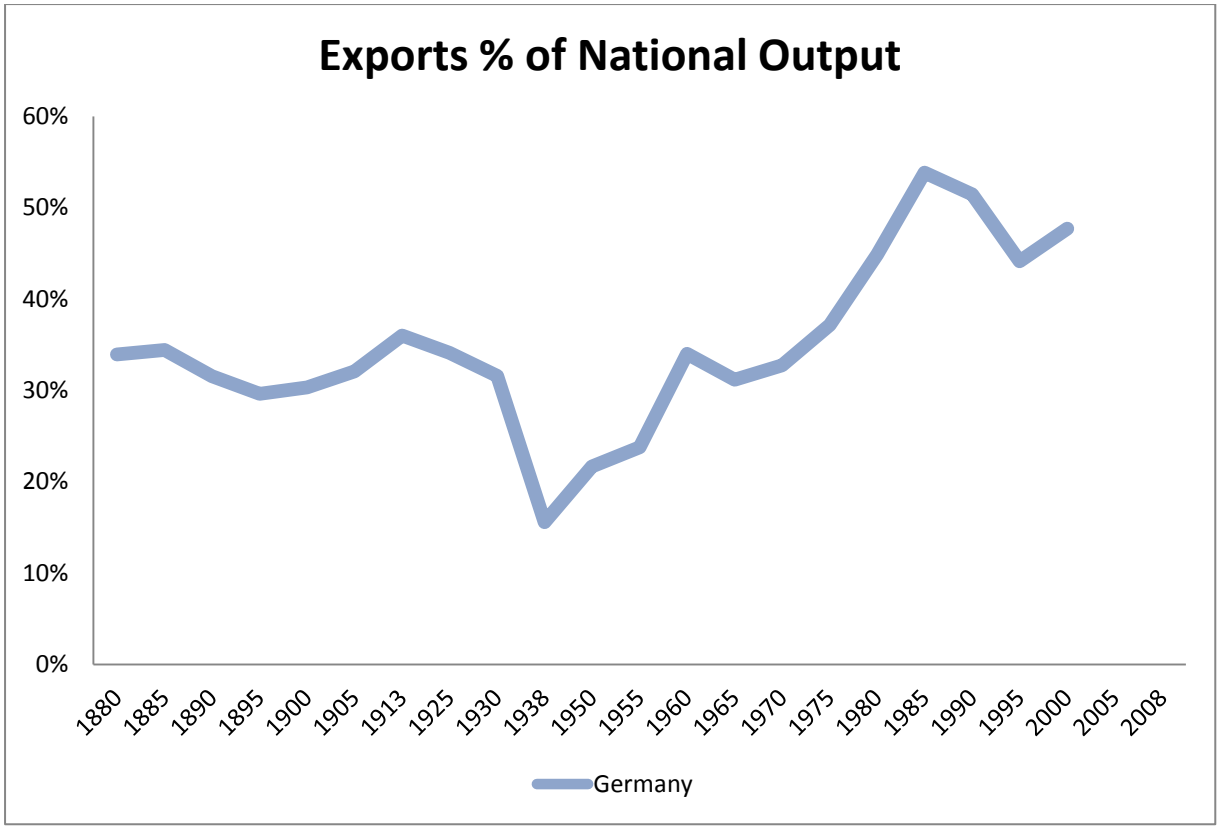
2008
France


Exports % of National Output
60%
50%
40%
30%
20%
10%
0%
1880
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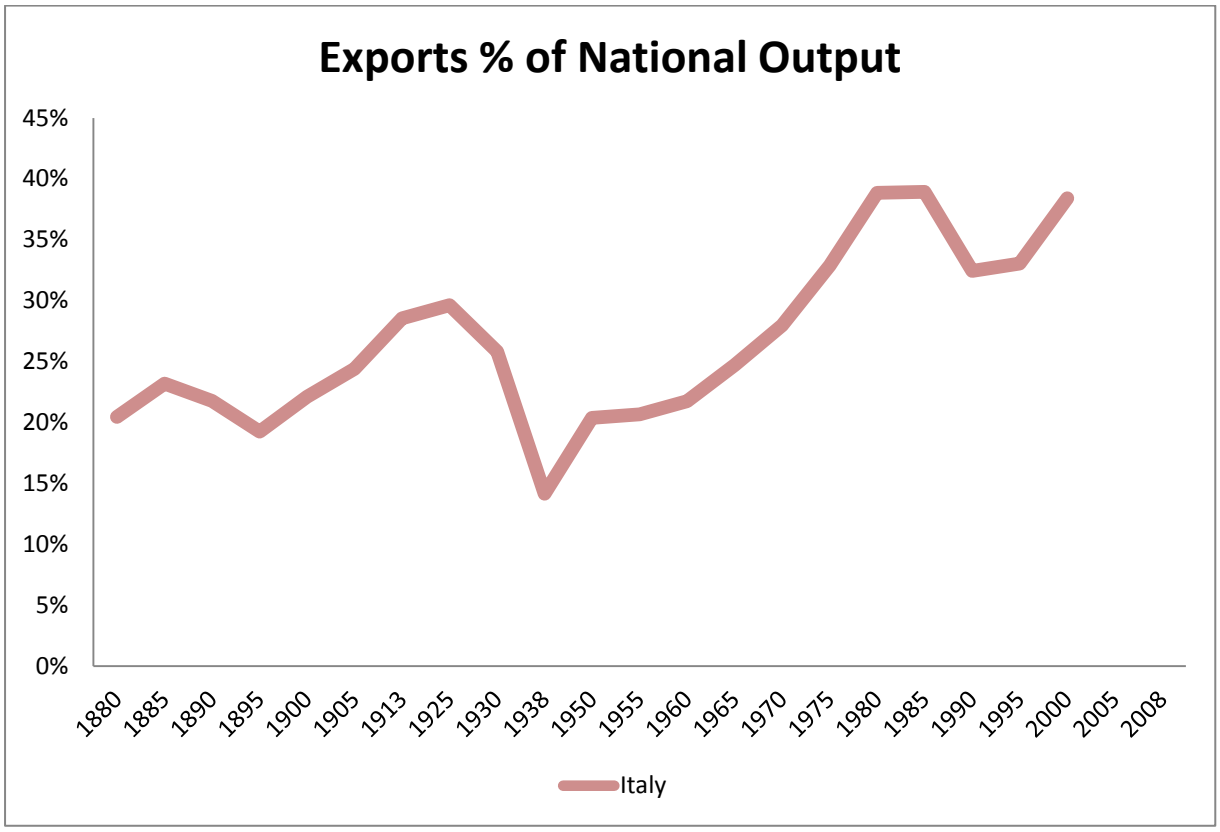
2005
2008
Germany


Exports % of National Output
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
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1890
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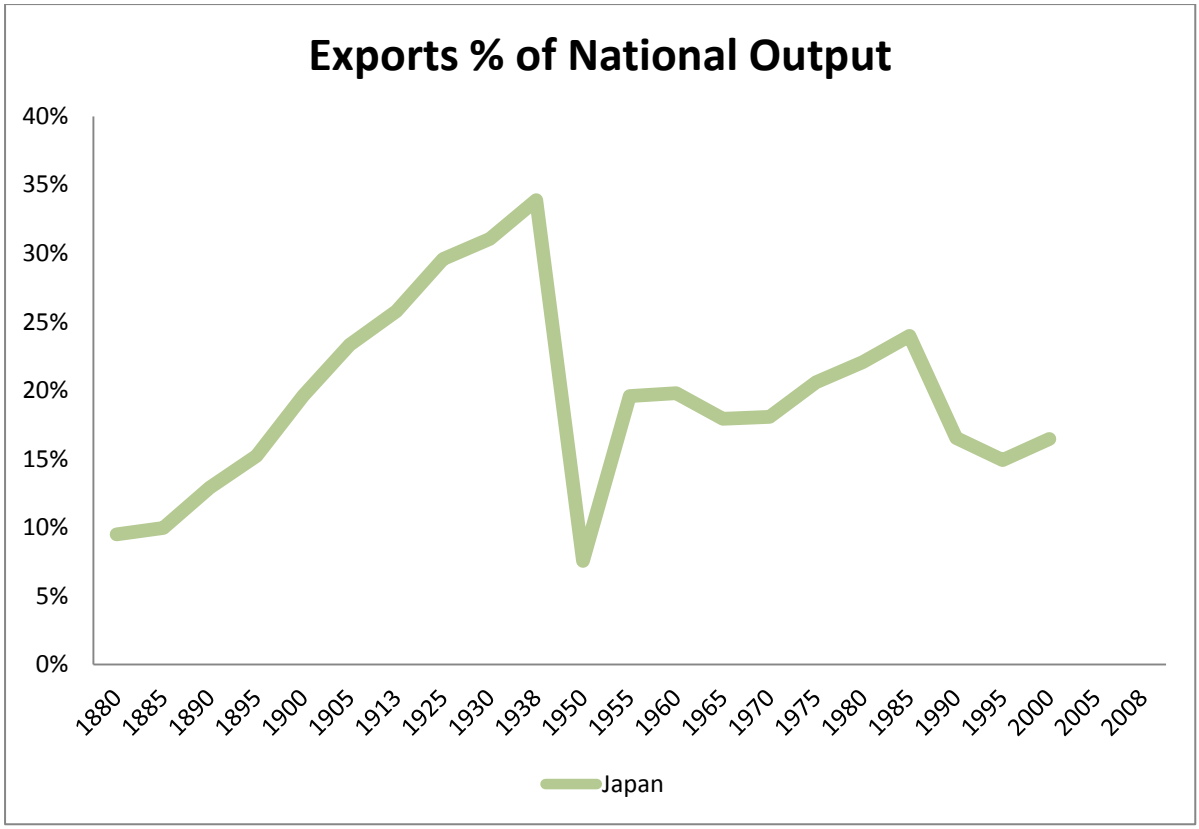
2008
Italy


Exports % of National Output
40%
35%
30%
25%
20%
15%
10%
5%
0%
1880
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1900
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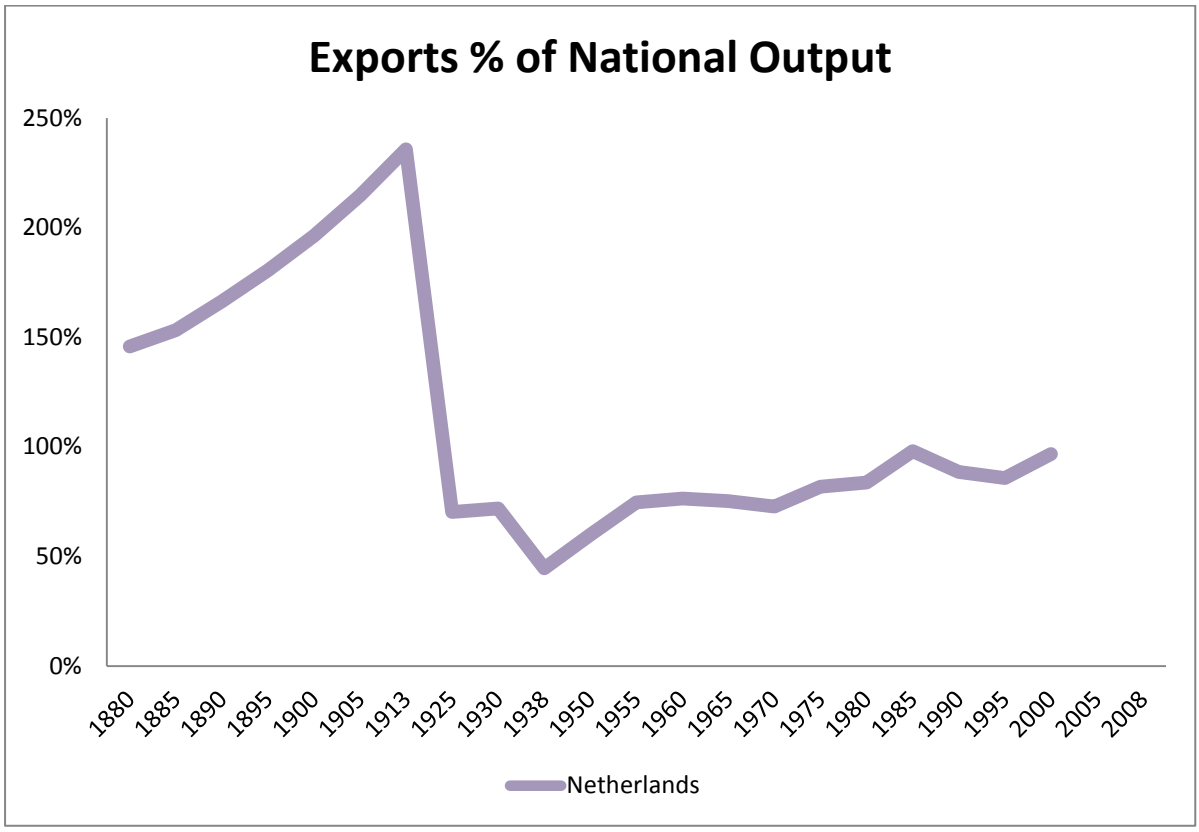
1995
2000
2005
2008
Japan


Exports % of National Output
250%
200%
150%
100%
50%
0%
1880
1885
1890
1895
1900
1905
1913
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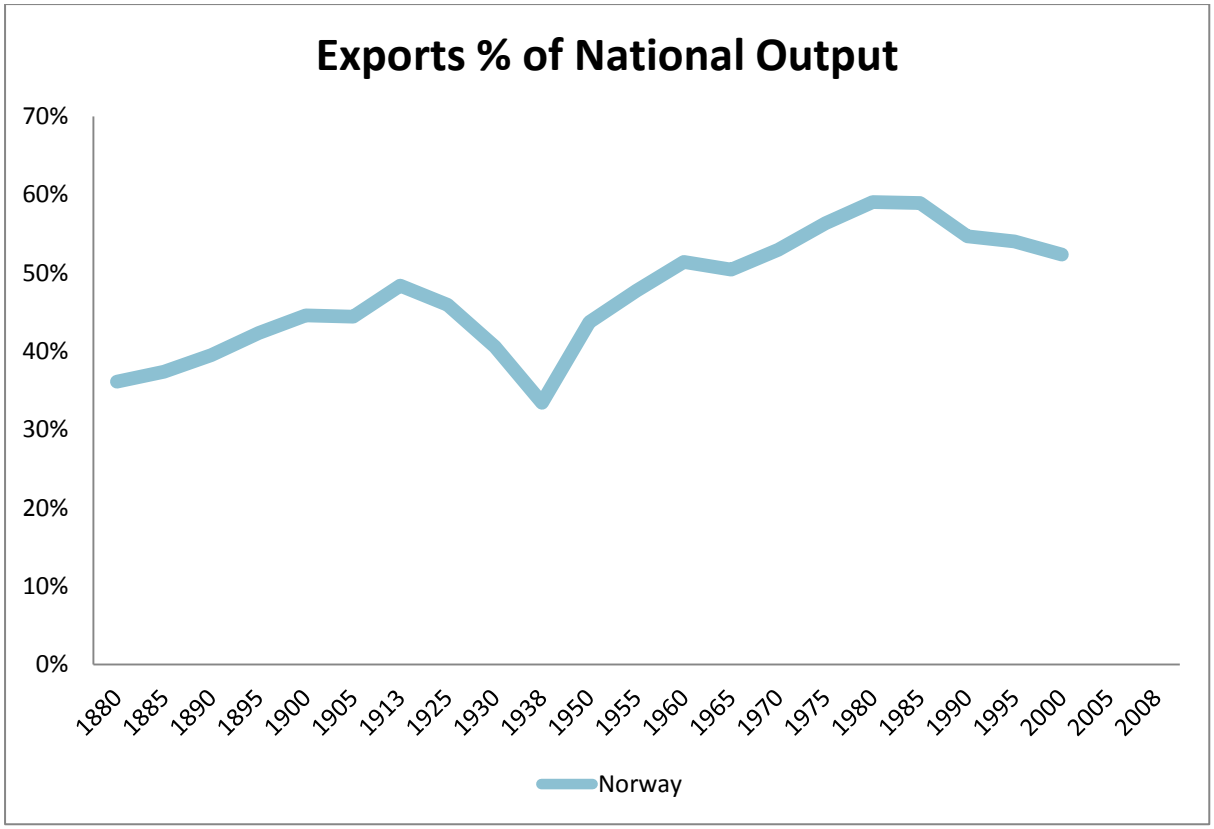
1990
1995
2000
2005
2008
Netherlands


Exports % of National Output
70%
60%
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20%
10%
0%
1880
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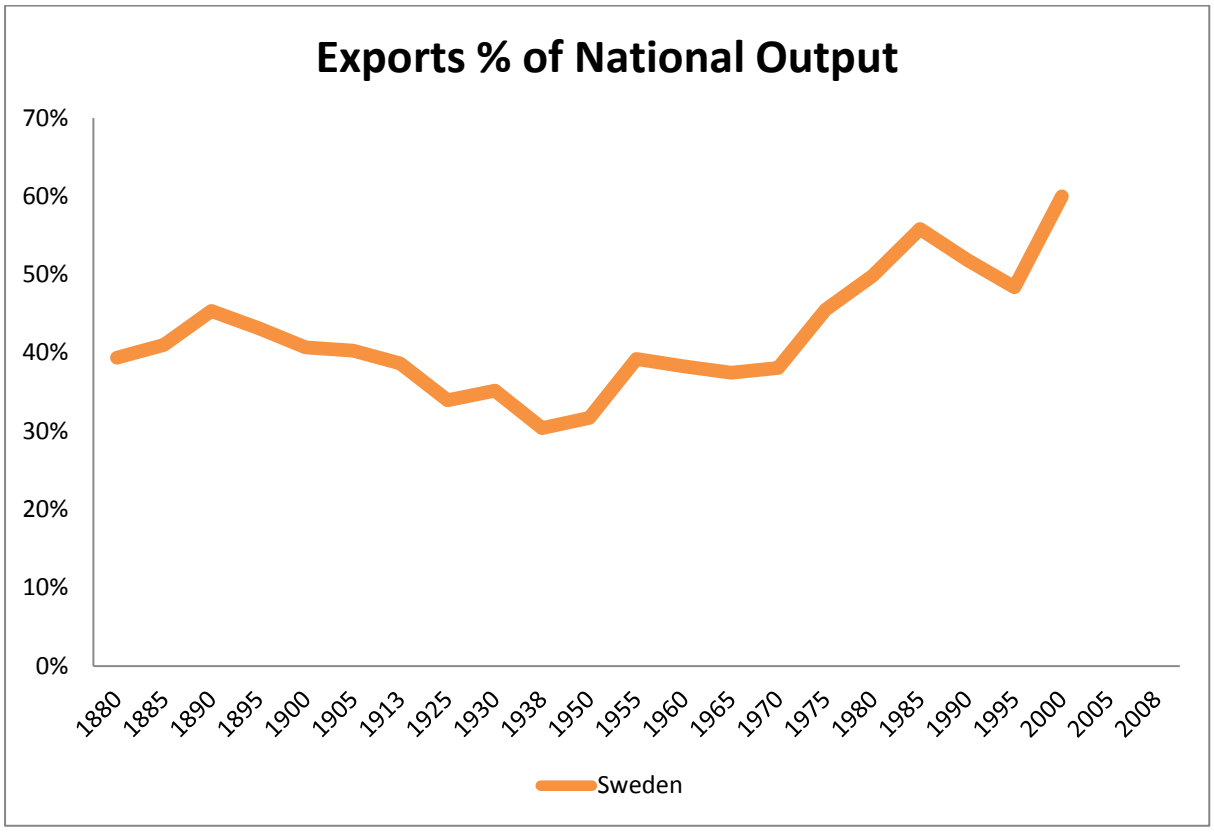
2008
Norway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30%
20%
10%
0%
1880
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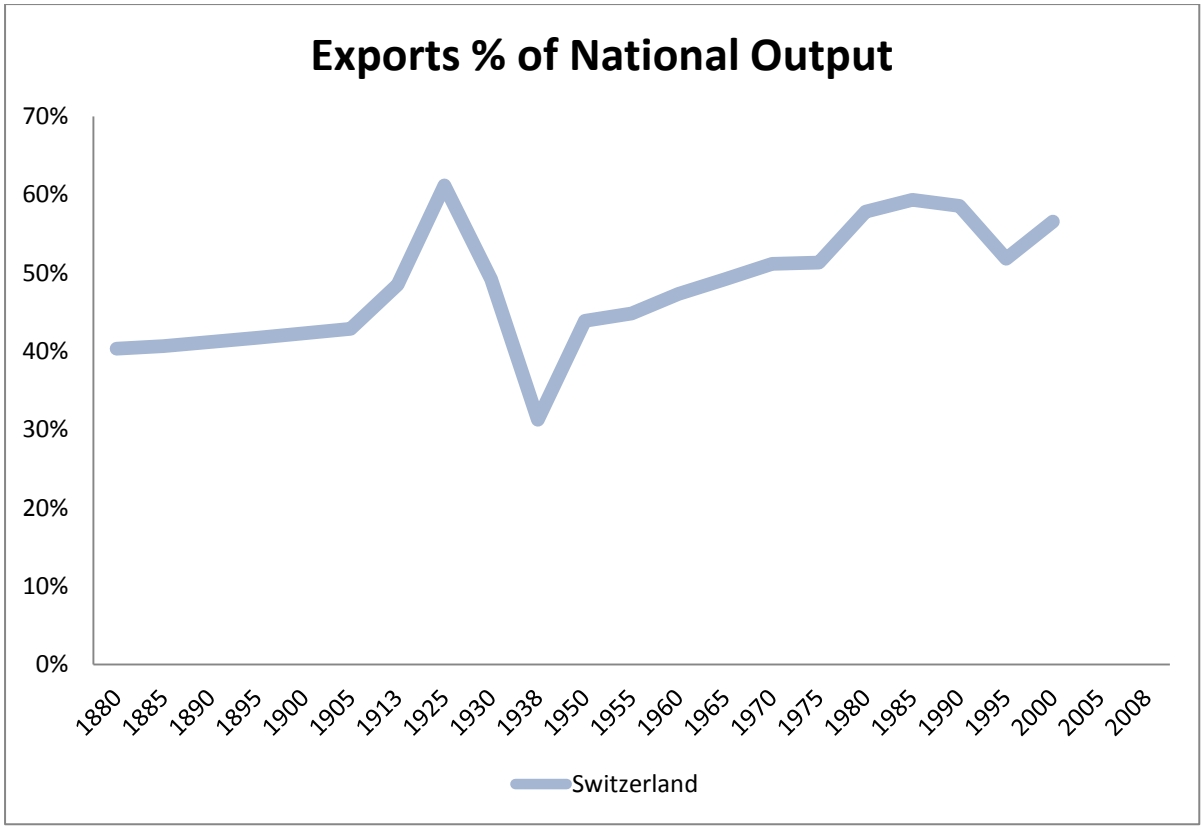
2008
Sweden


Exports % of National Output
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60%
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40%
30%
20%
10%
0%
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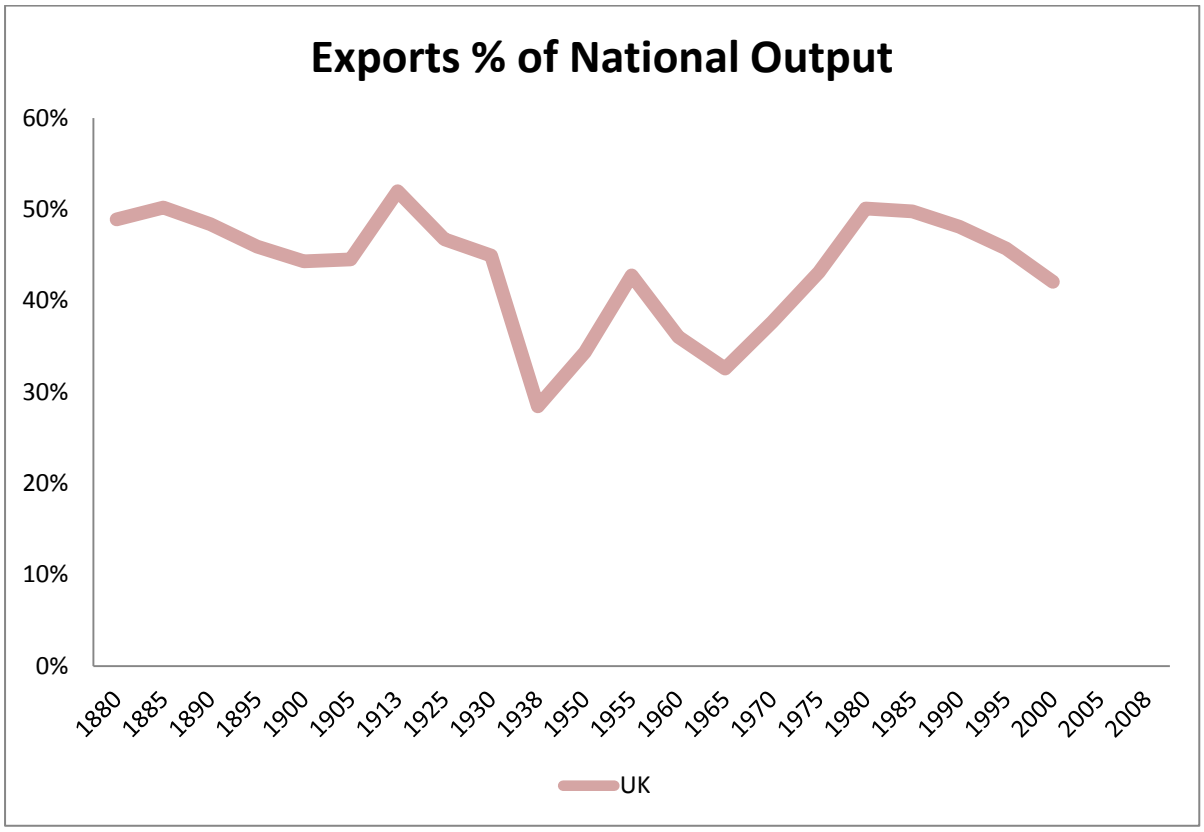
2008
Switzerland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50%
40%
30%
20%
10%
0%
1880
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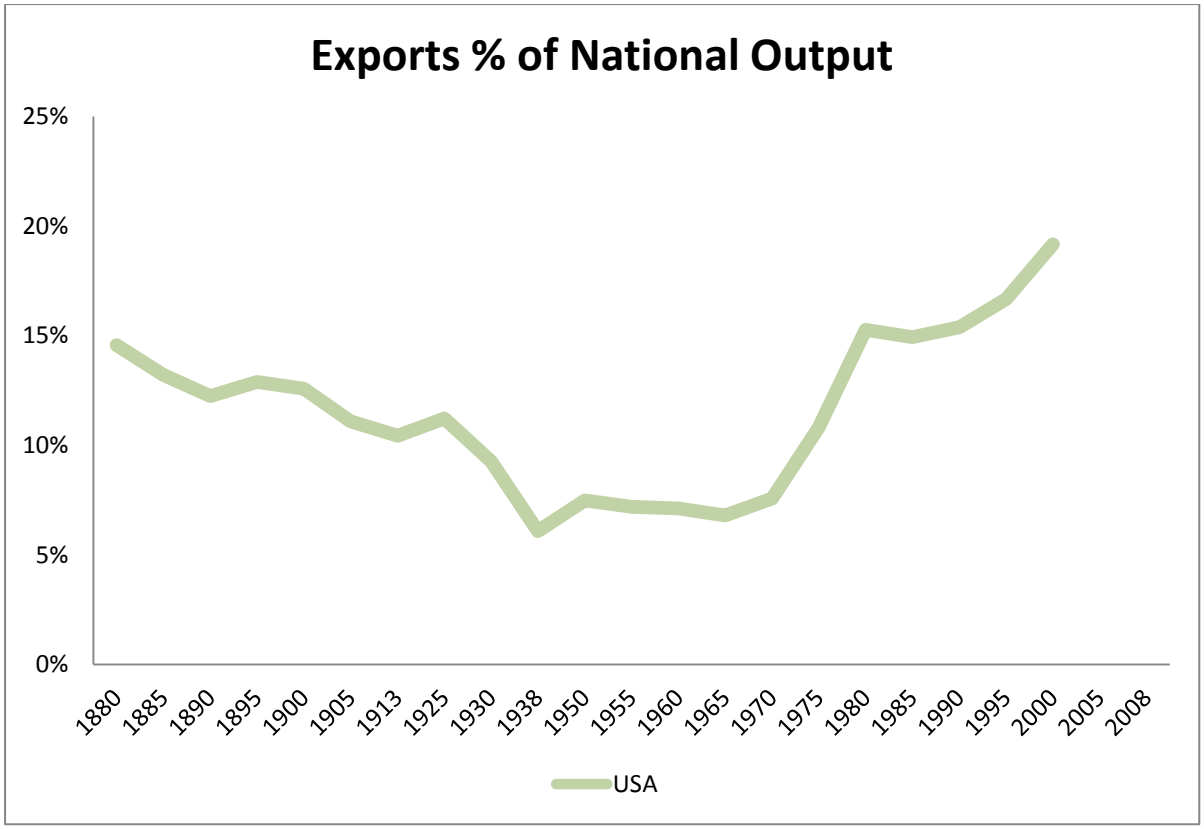
2008
UK


Exports % of National Output
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20%
15%
10%
5%
0%
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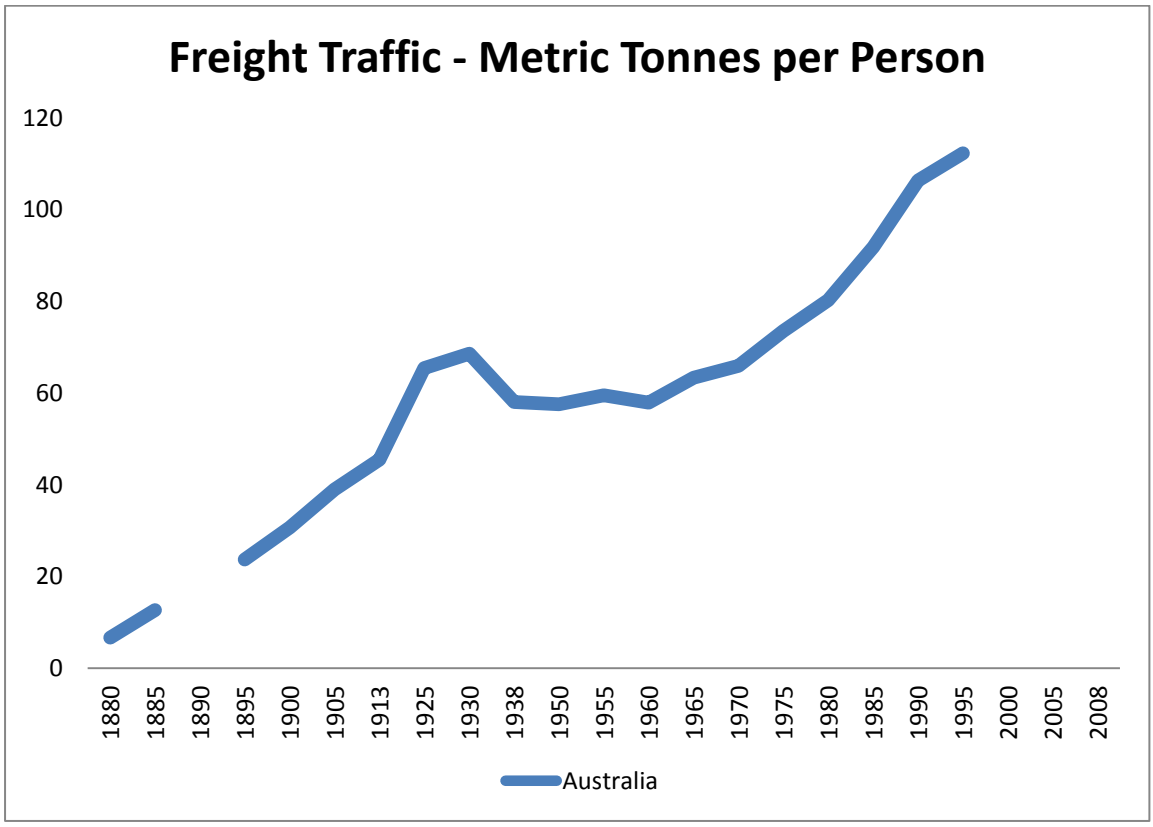
2008
USA

**APPENDIX 5.8**


Freight Traffic - Metric Tonnes per Person
120
100
80
60
40
20
0
1880
1885
1890
1895
1900
1905
1913
1925
1930
1938
1950
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1960
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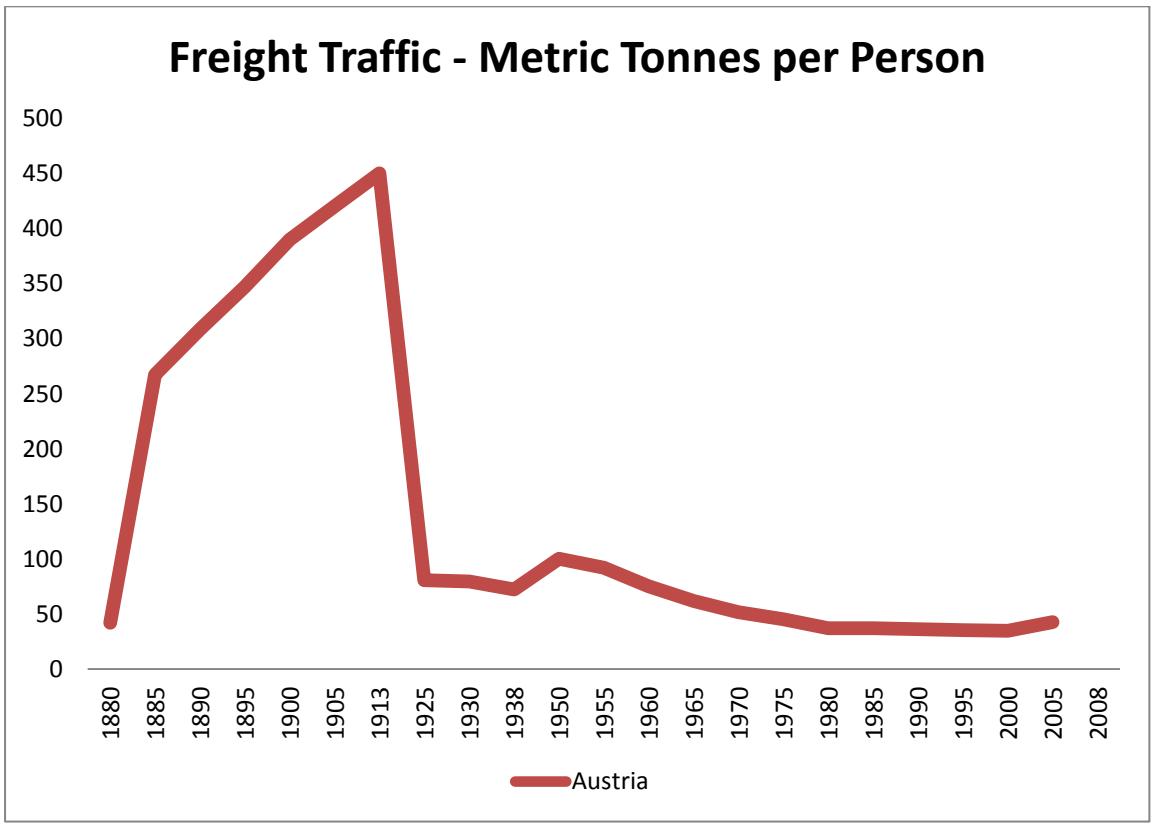
1995
2000
2005
2008
Australia


Freight Traffic - Metric Tonnes per Person
500
450
400
350
300
250
200
150
100
50
0
1880
1885
1890
1895
1900
1905
1913
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1938
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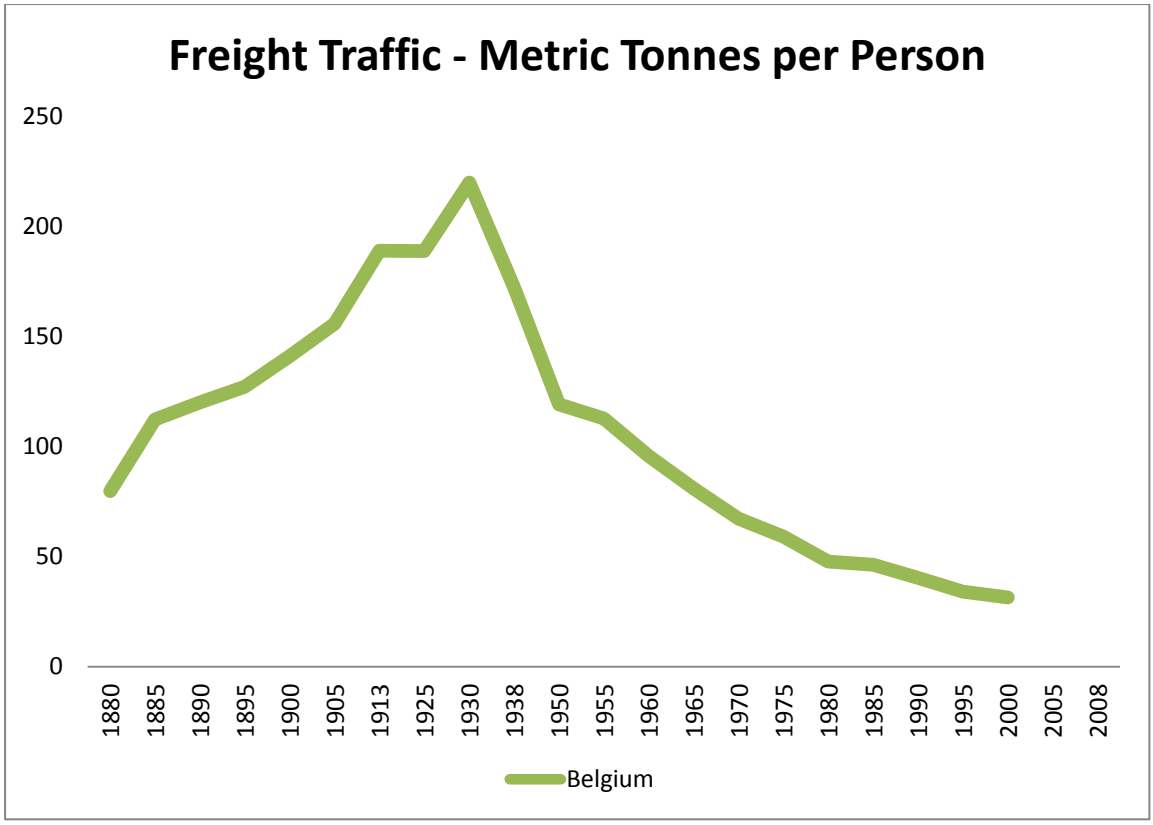
2005
2008
Austria


Freight Traffic - Metric Tonnes per Person
250
200
150
100
50
0
1880
1885
1890
1895
1900
1905
1913
1925
1930
1938
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1985
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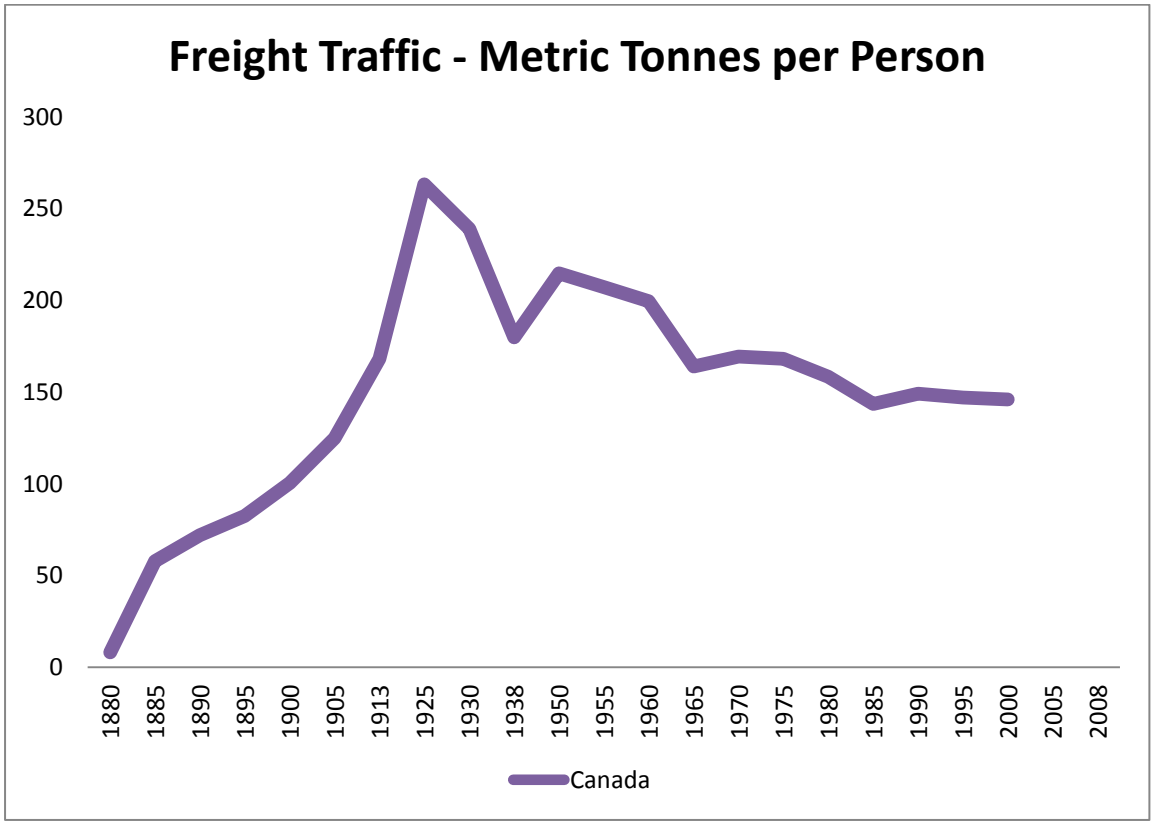
2008
Belgium


Freight Traffic - Metric Tonnes per Person
300
250
200
150
100
50
0
1880
1885
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1895
1900
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1925
1930
1938
1950
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1990
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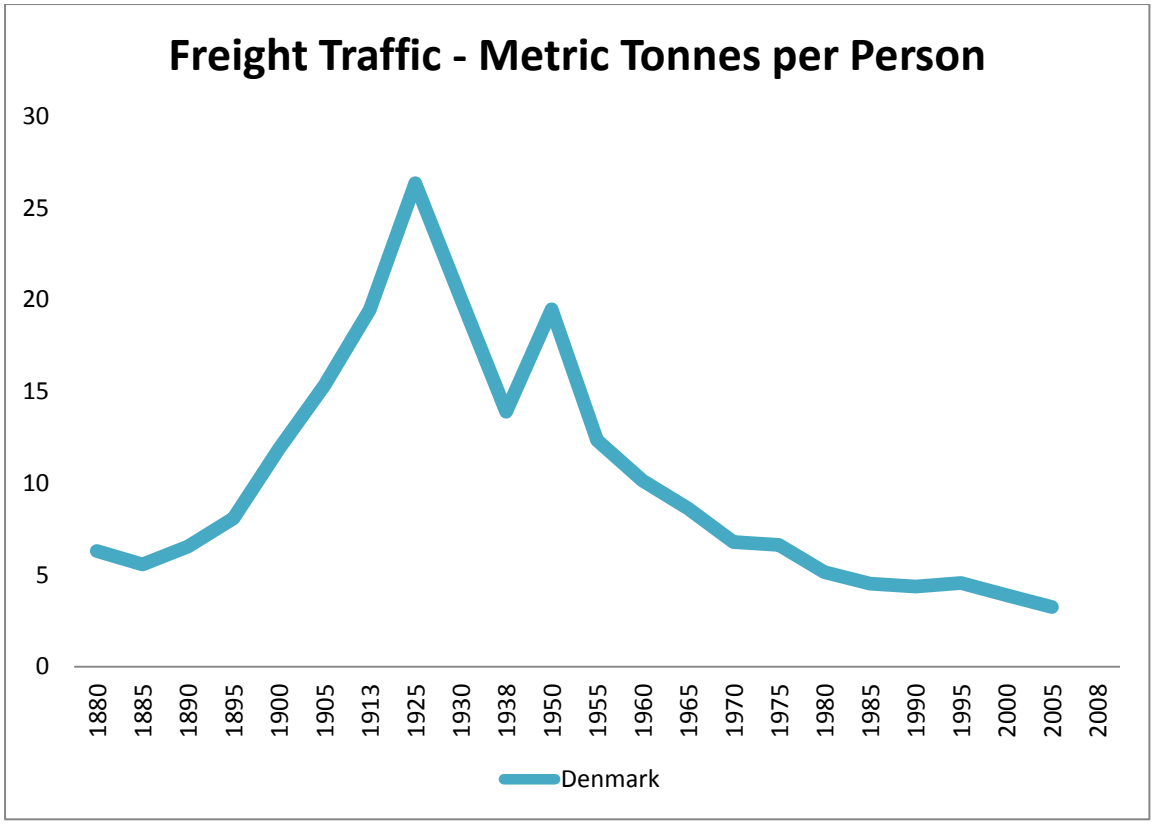
2000
2005
2008
Canada


Freight Traffic - Metric Tonnes per Person
30
25
20
15
10
5
0
1880
1885
1890
1895
1900
1905
1913
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1930
1938
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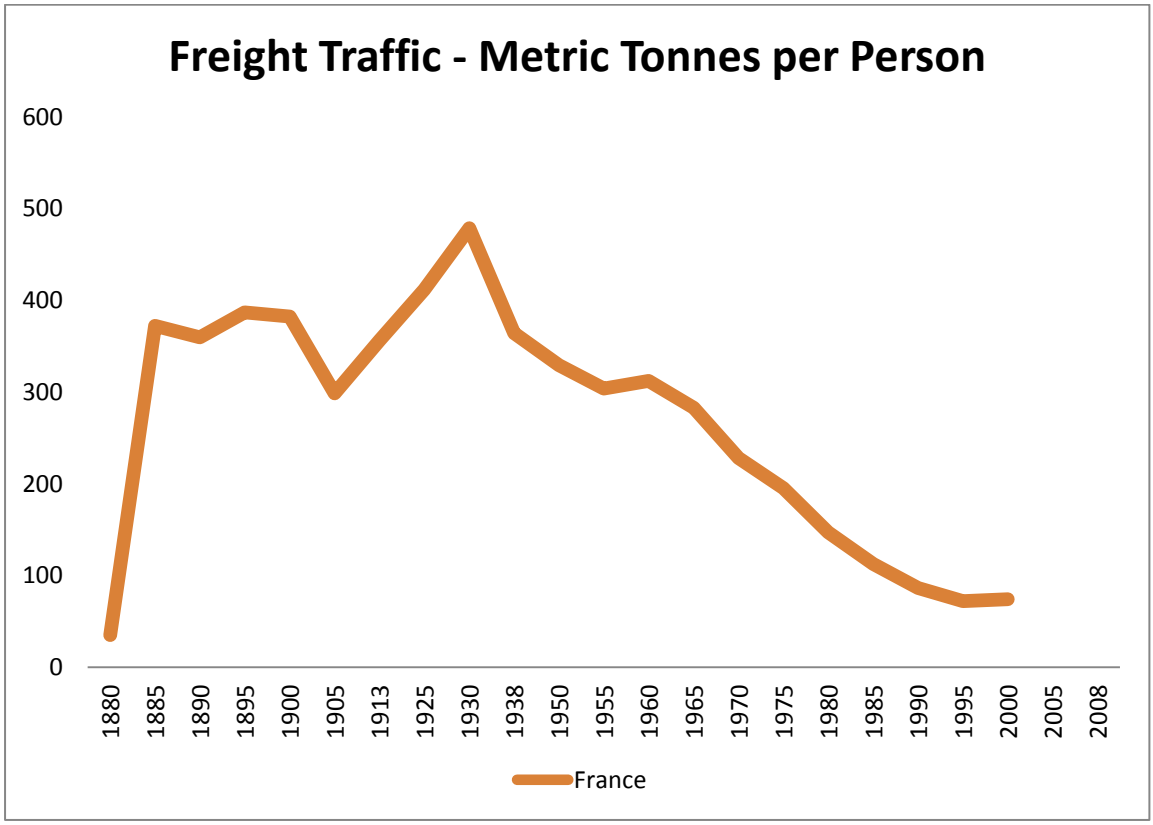
2000
2005
2008
Denmark


Freight Traffic - Metric Tonnes per Person
600
500
400
300
200
100
0
1880
1885
1890
1895
1900
1905
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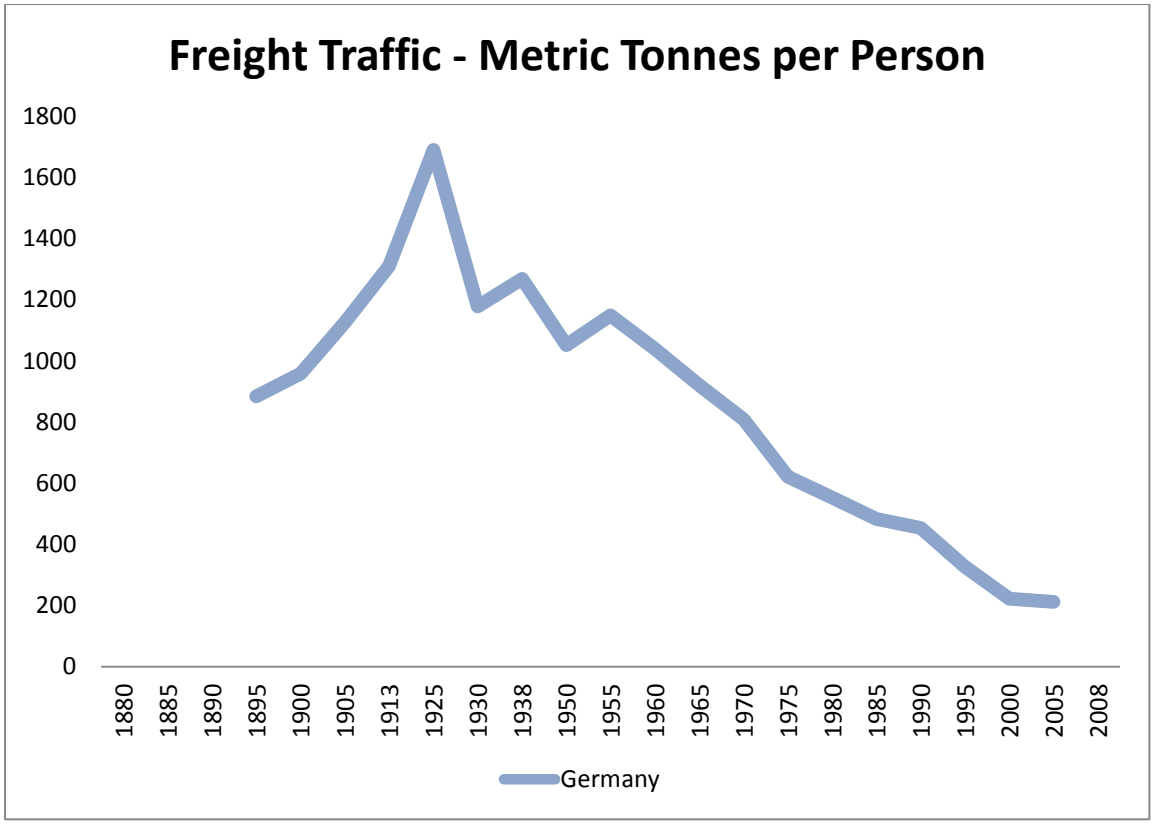
2008
France


Freight Traffic - Metric Tonnes per Person
1800
1600
1400
1200
1000
800
600
400
200
0
1880
1885
1890
1895
1900
1905
1913
1925
1930
1938
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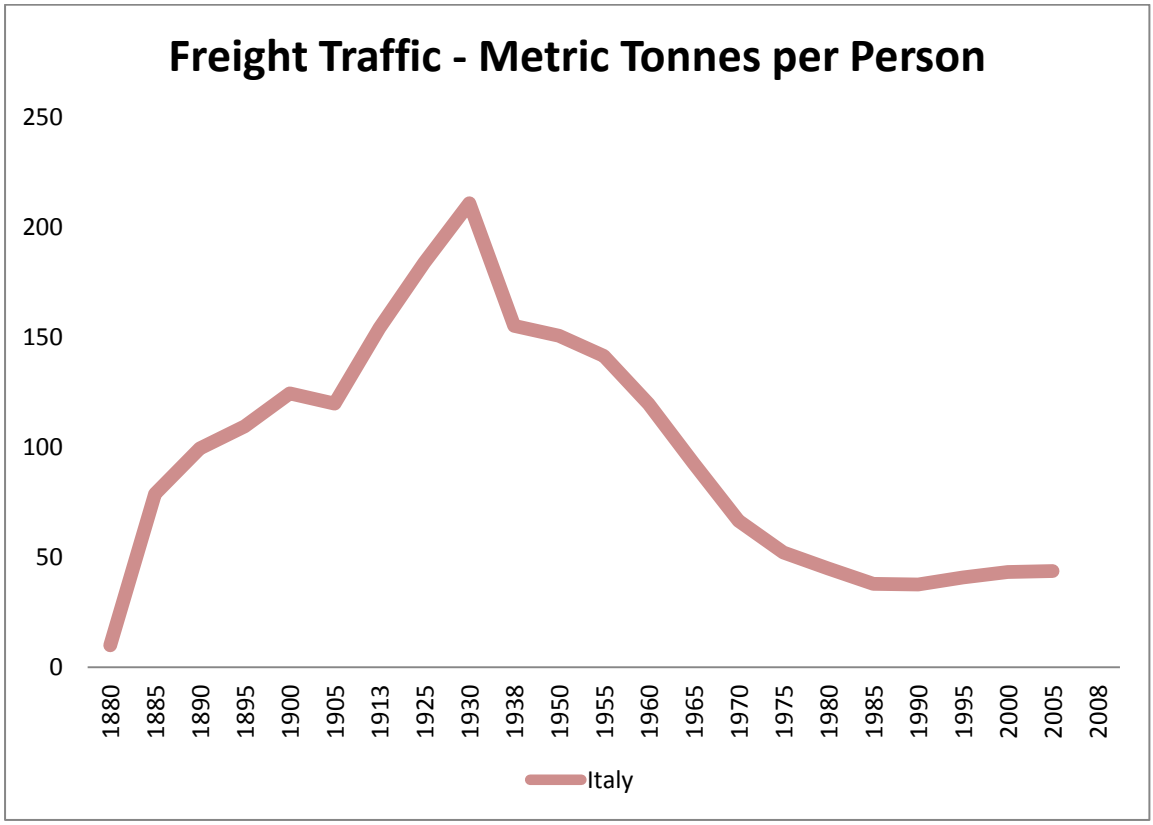
2008
Germany


Freight Traffic - Metric Tonnes per Person
250
200
150
100
50
0
1880
1885
1890
1895
1900
1905
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1938
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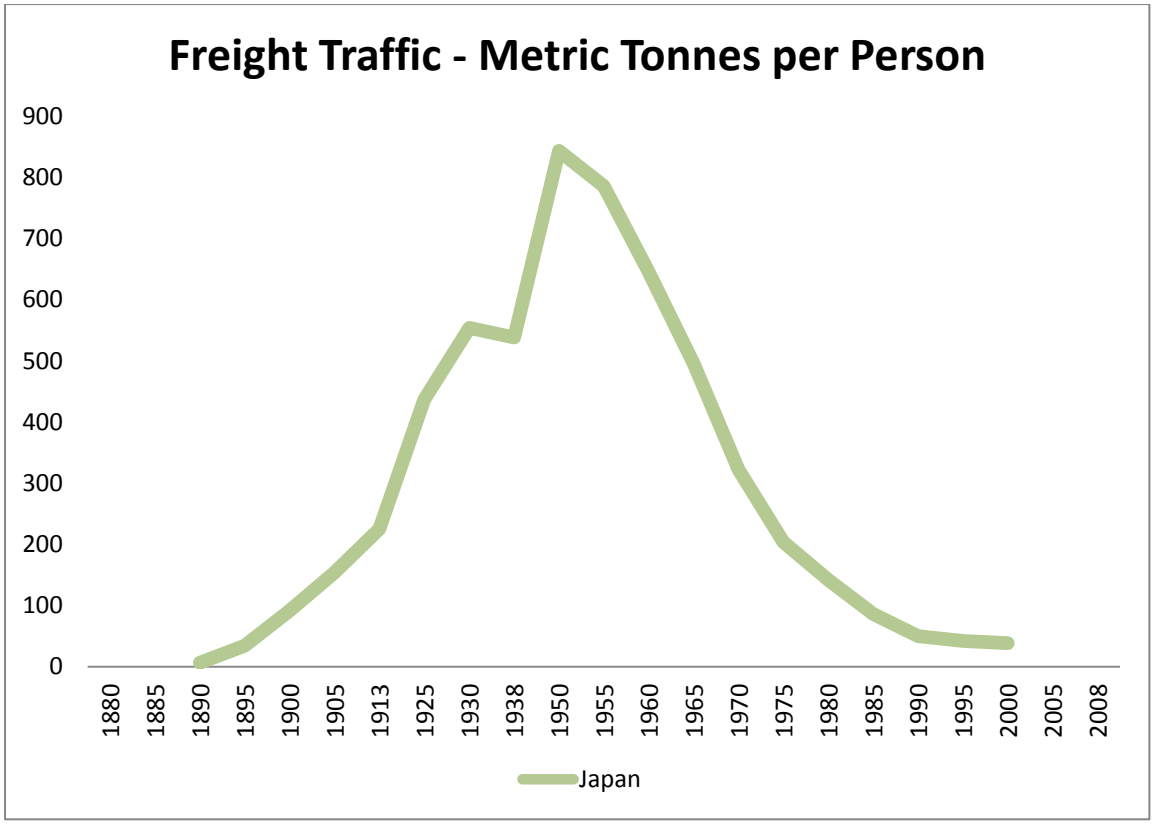
2008
Italy


Freight Traffic - Metric Tonnes per Person
900
800
700
600
500
400
300
200
100
0
1880
1885
1890
1895
1900
1905
1913
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1930
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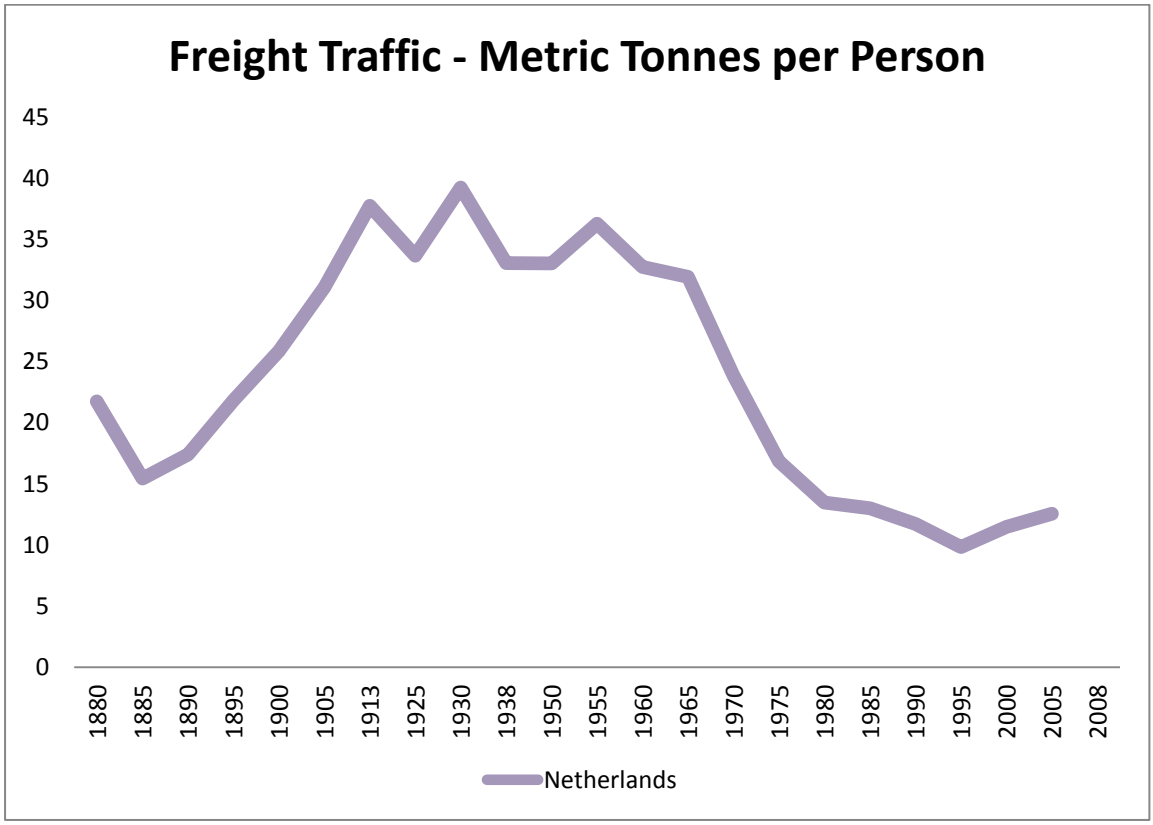
2005
2008
Japan


Freight Traffic - Metric Tonnes per Person
45
40
35
30
25
20
15
10
5
0
1880
1885
1890
1895
1900
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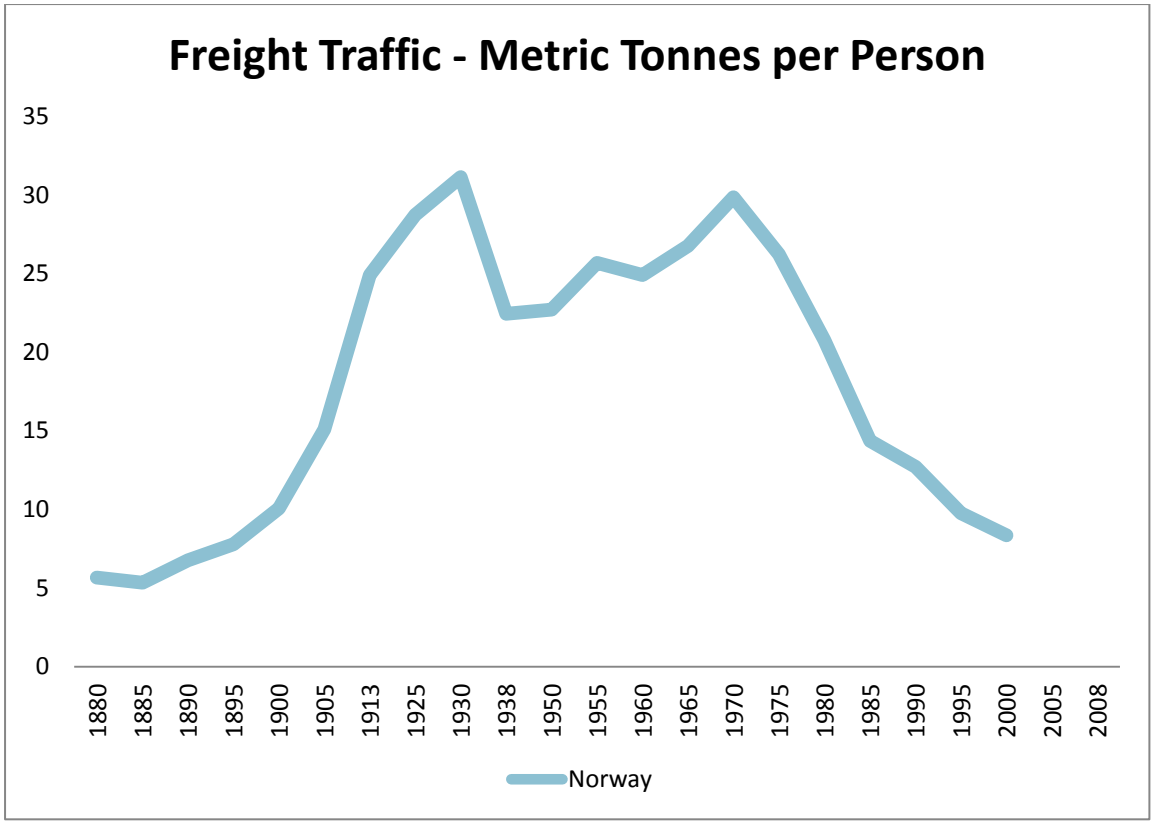
2008
Netherlands


Freight Traffic - Metric Tonnes per Person
35
30
25
20
15
10
5
0
1880
1885
1890
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1900
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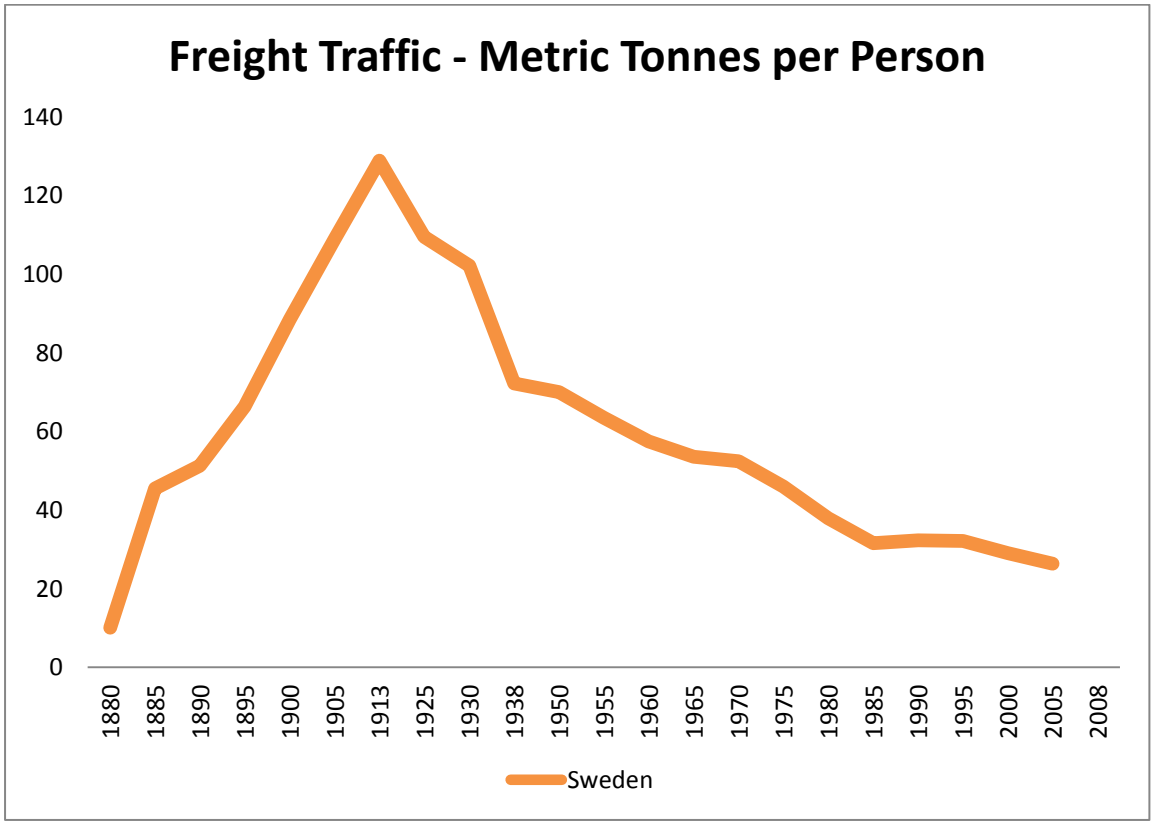
Norway


Freight Traffic - Metric Tonnes per Person
140
120
100
80
60
40
20
0
1880
1885
1890
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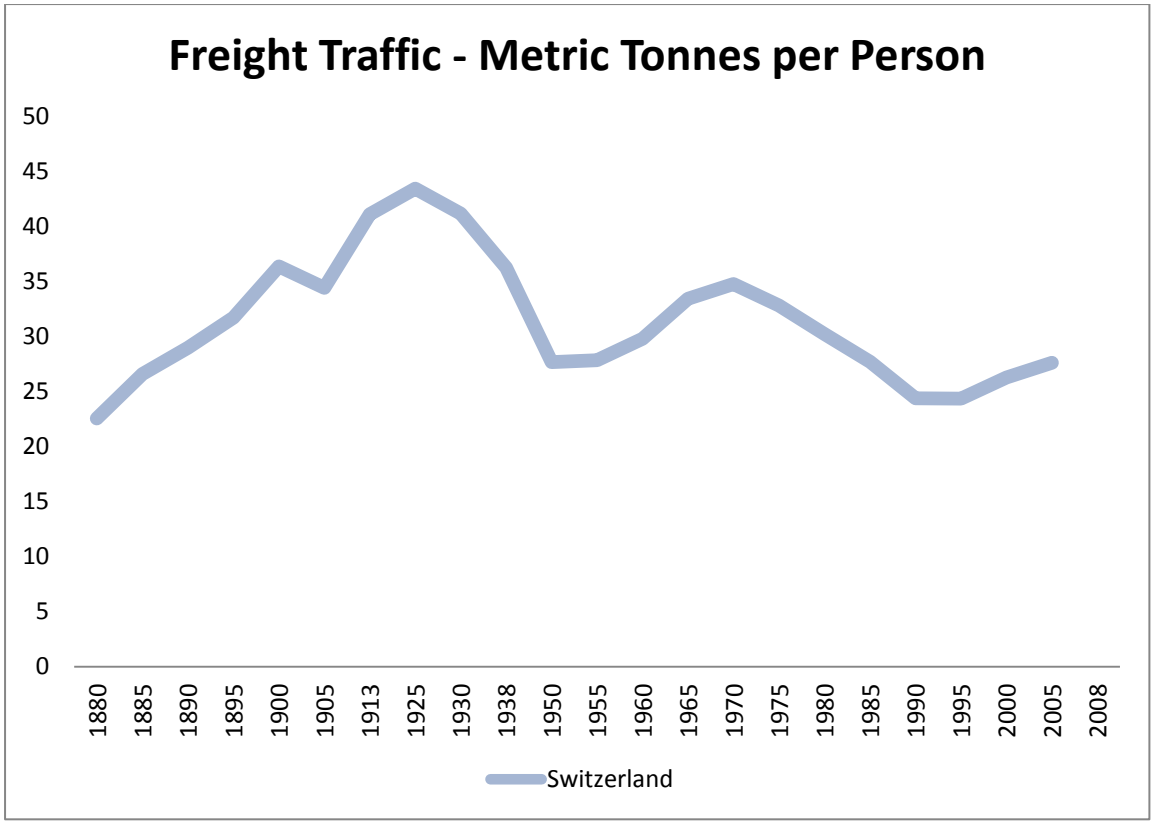
Sweden


Freight Traffic - Metric Tonnes per Person
50
45
40
35
30
25
20
15
10
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0
1880
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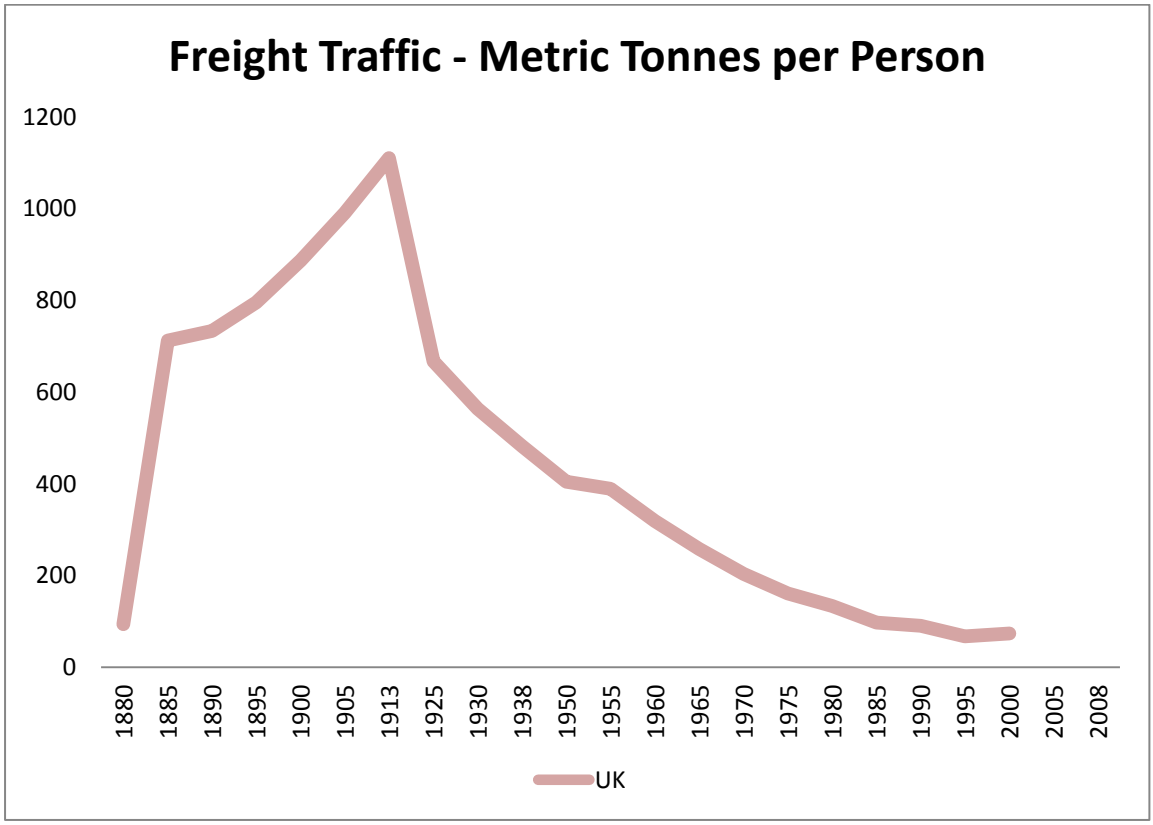
Switzerland


Freight Traffic - Metric Tonnes per Person
1200
1000
800
600
400
200
0
1880
1885
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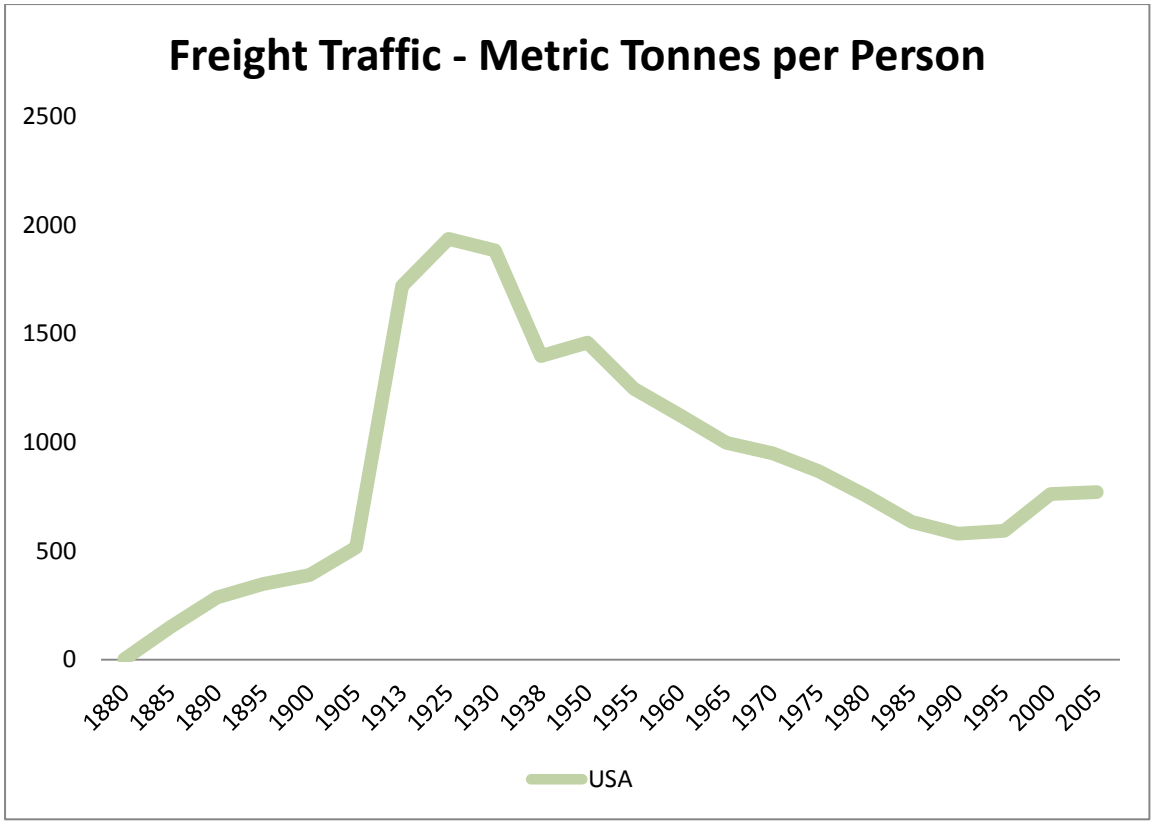
Freight Traffic - Metric Tonnes per Person
2500
2000
1500
1000
500
0
1880
1885
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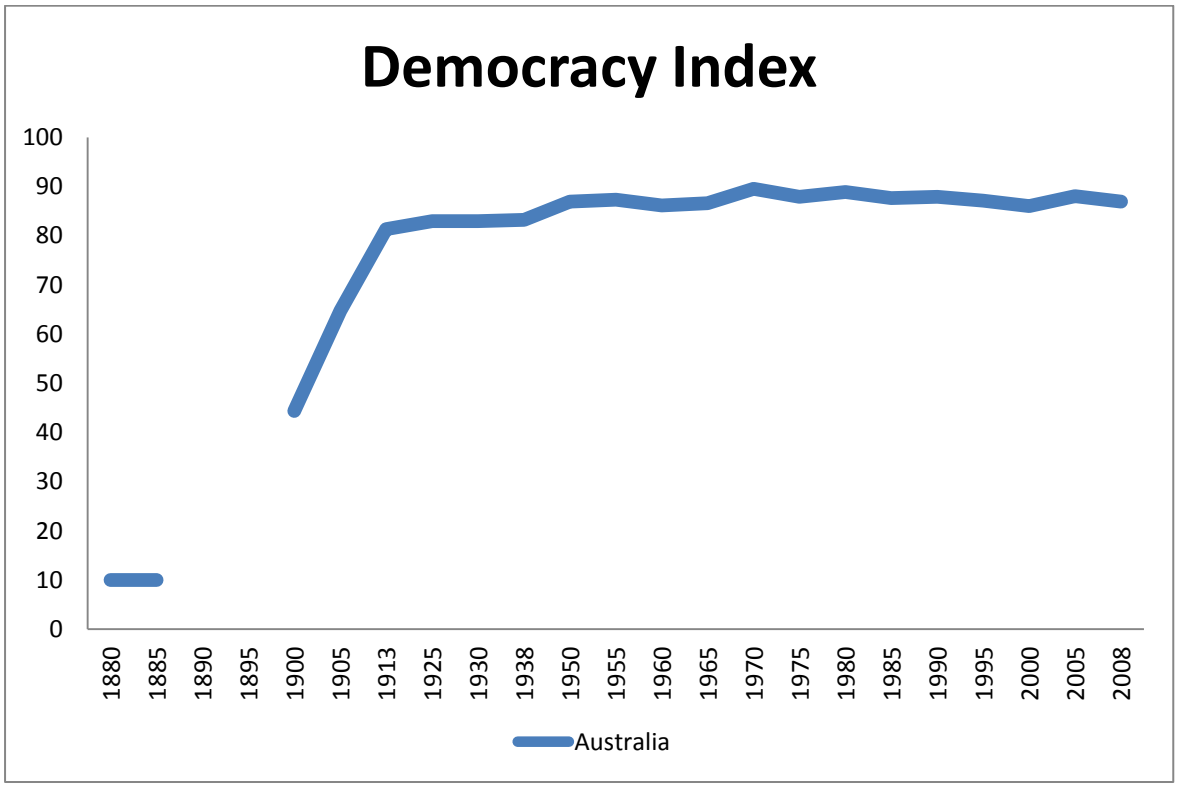
USA

**APPENDIX 5.9**


Democracy Index
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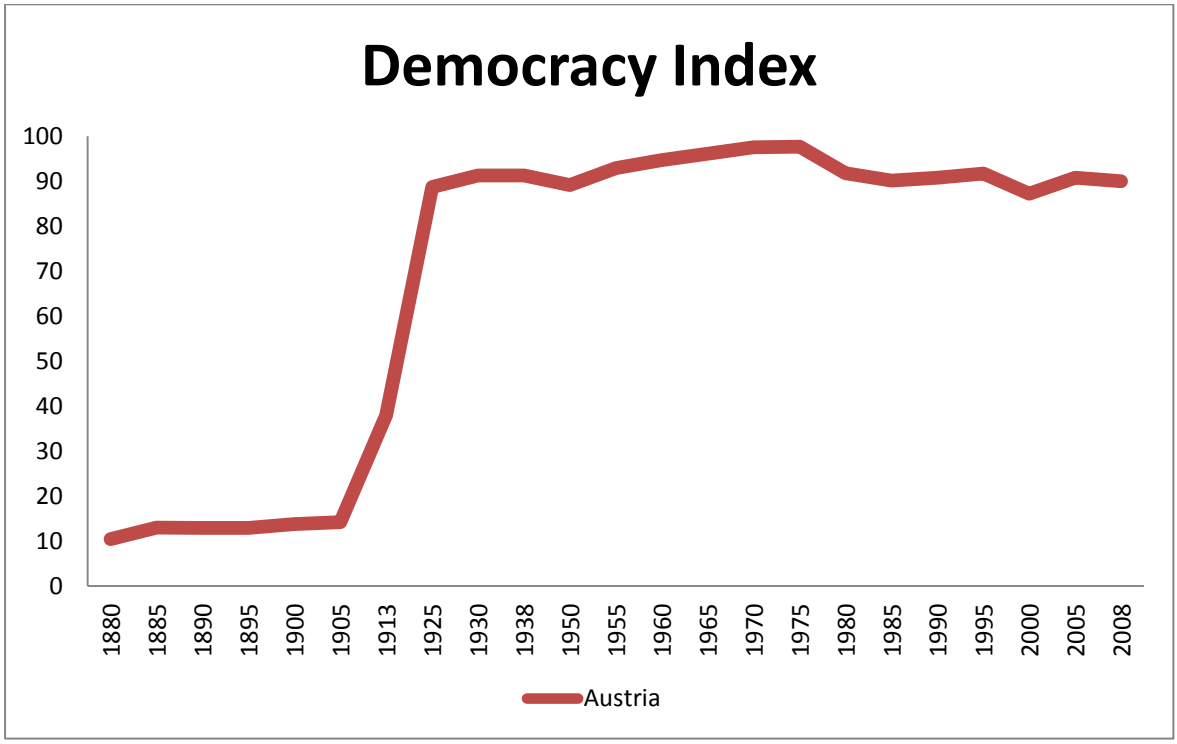
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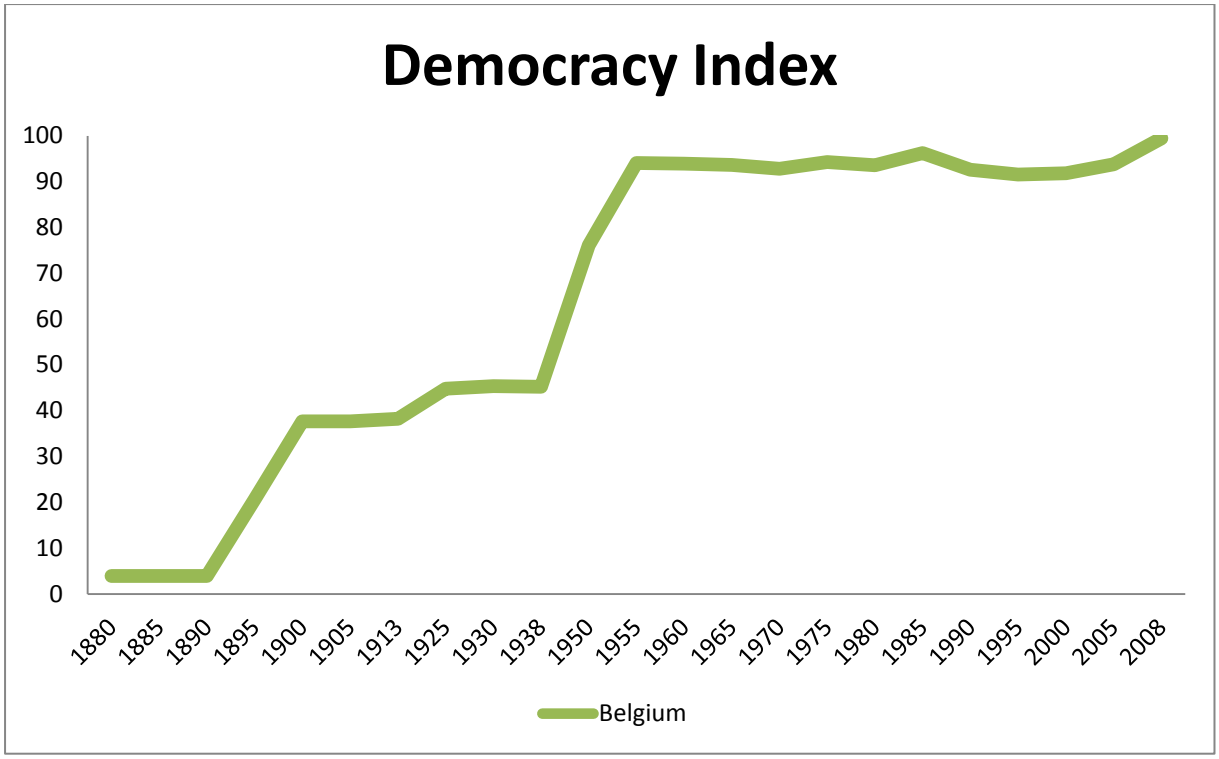
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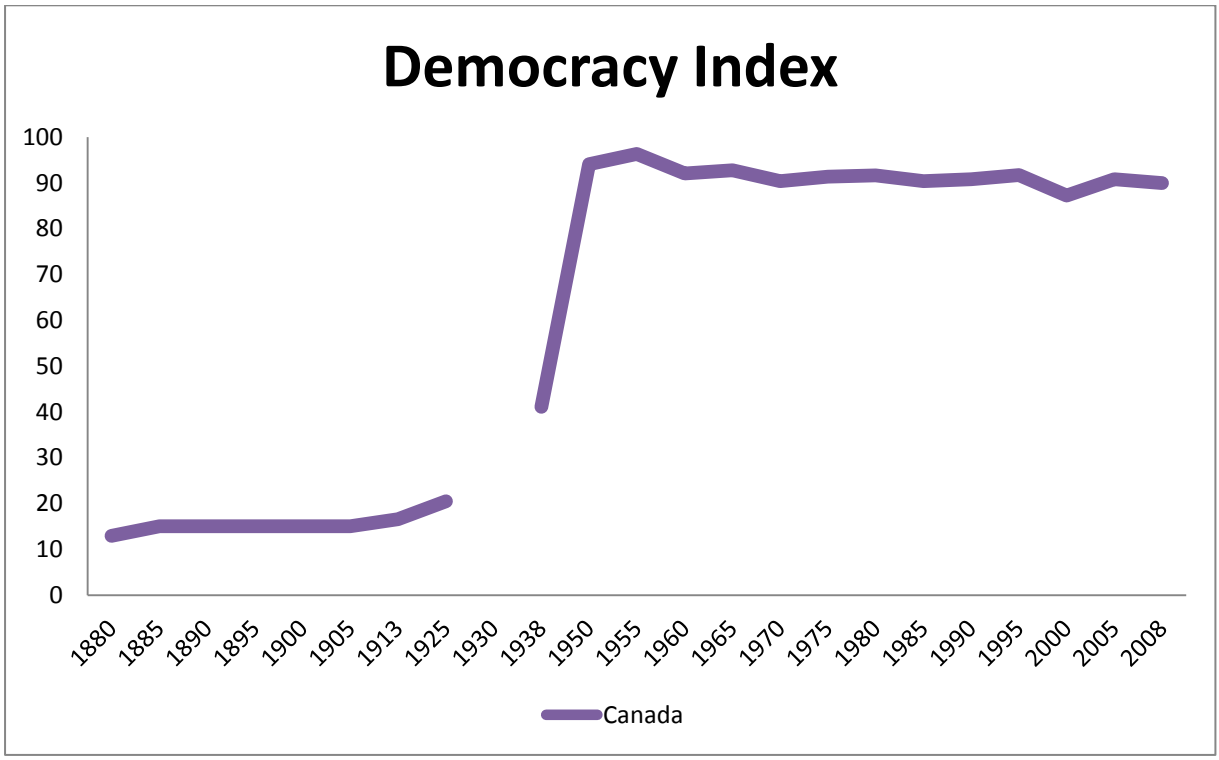
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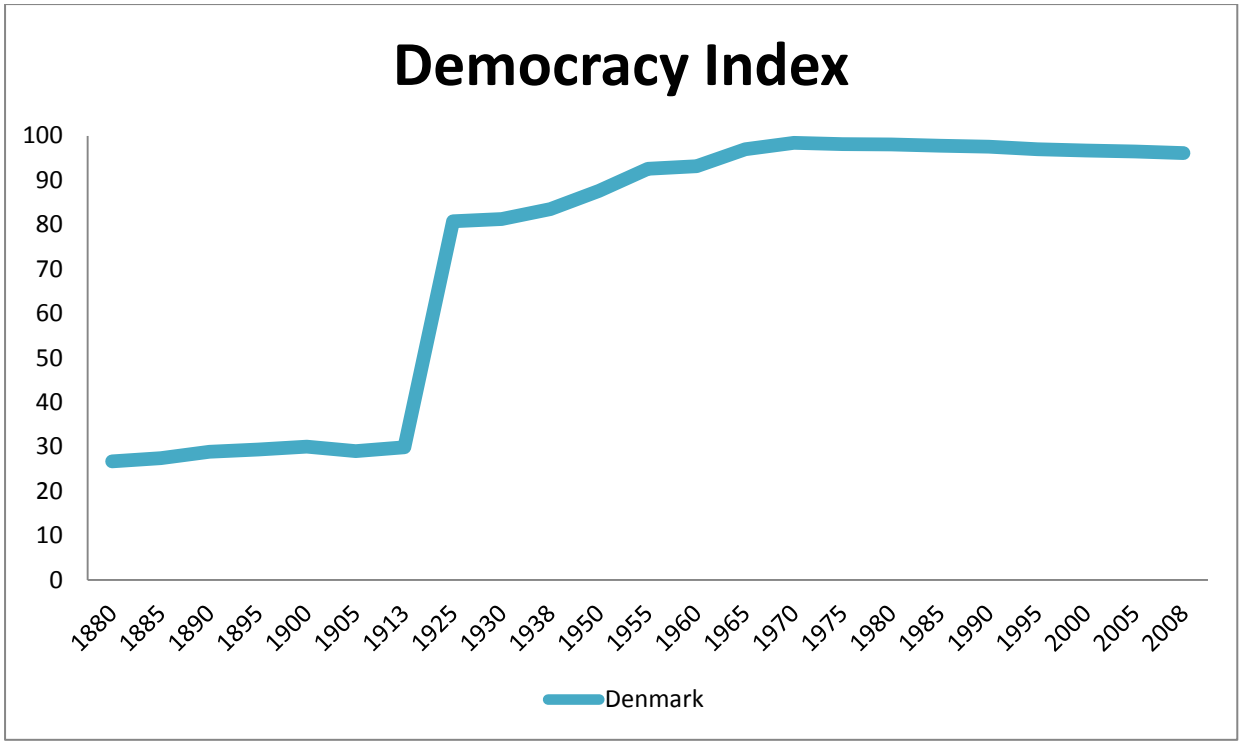
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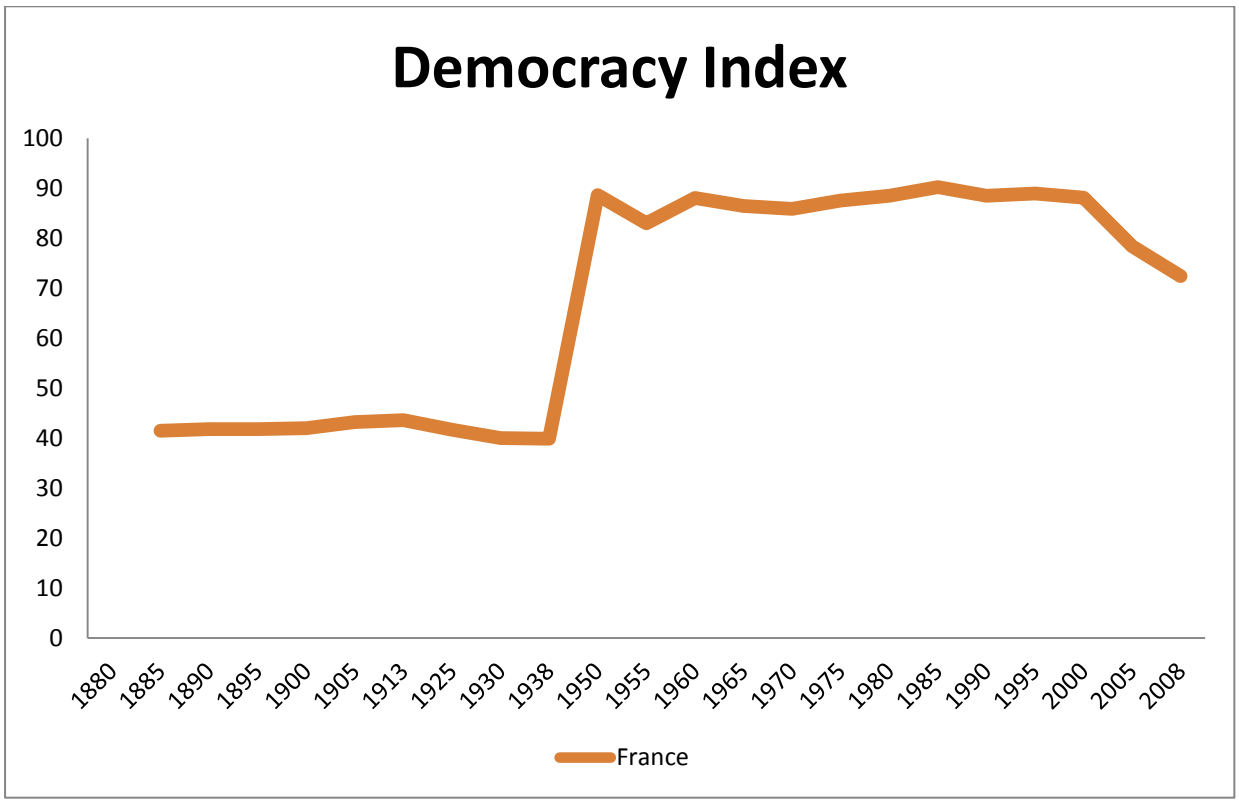
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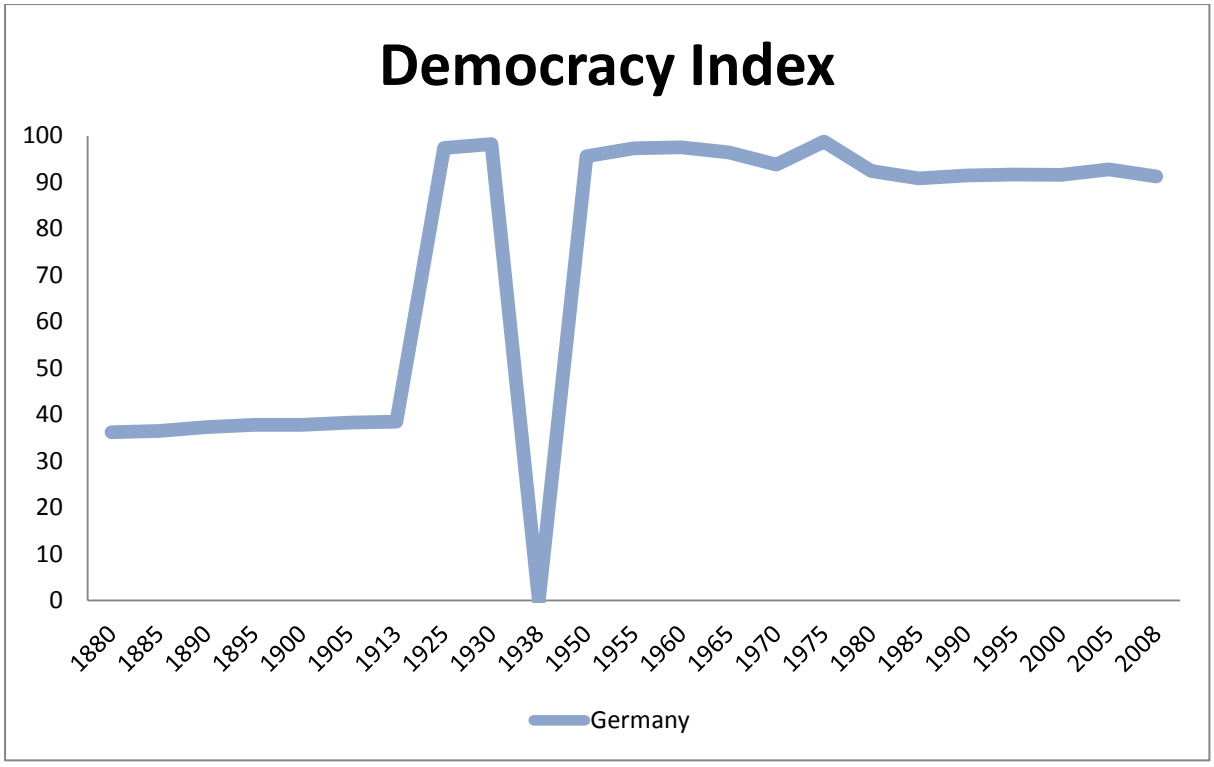
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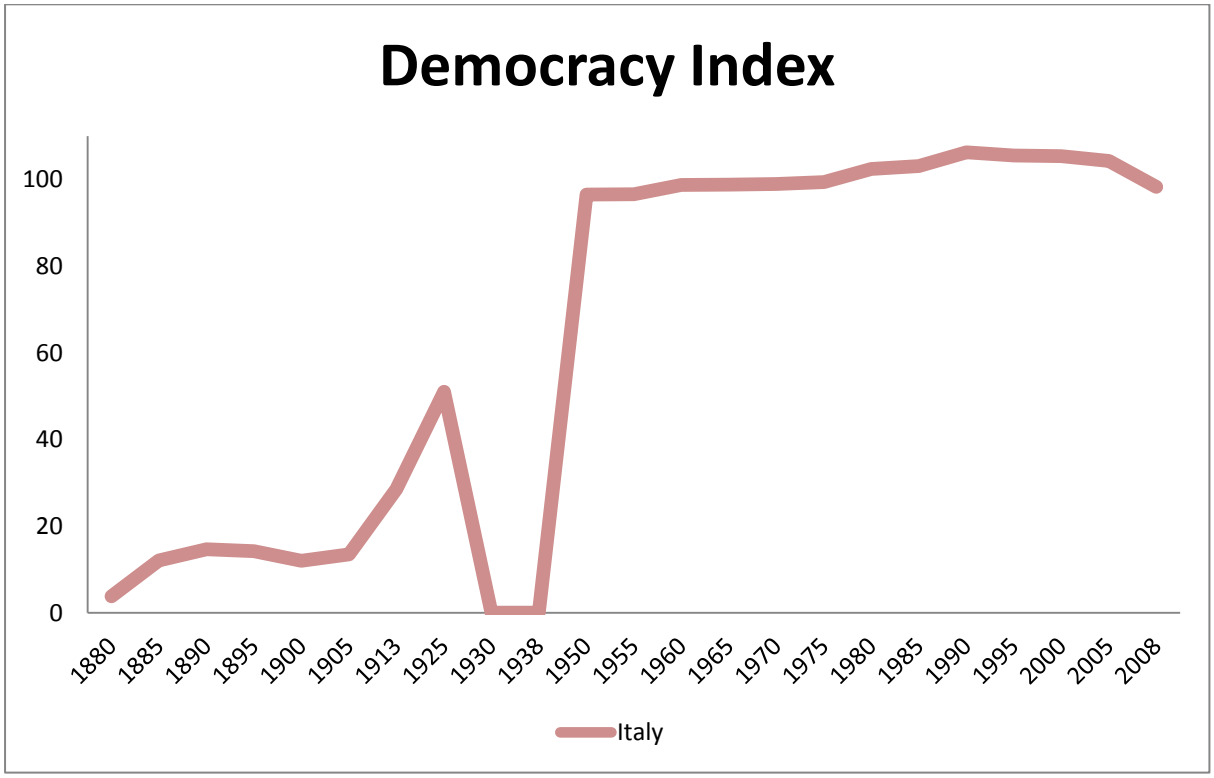
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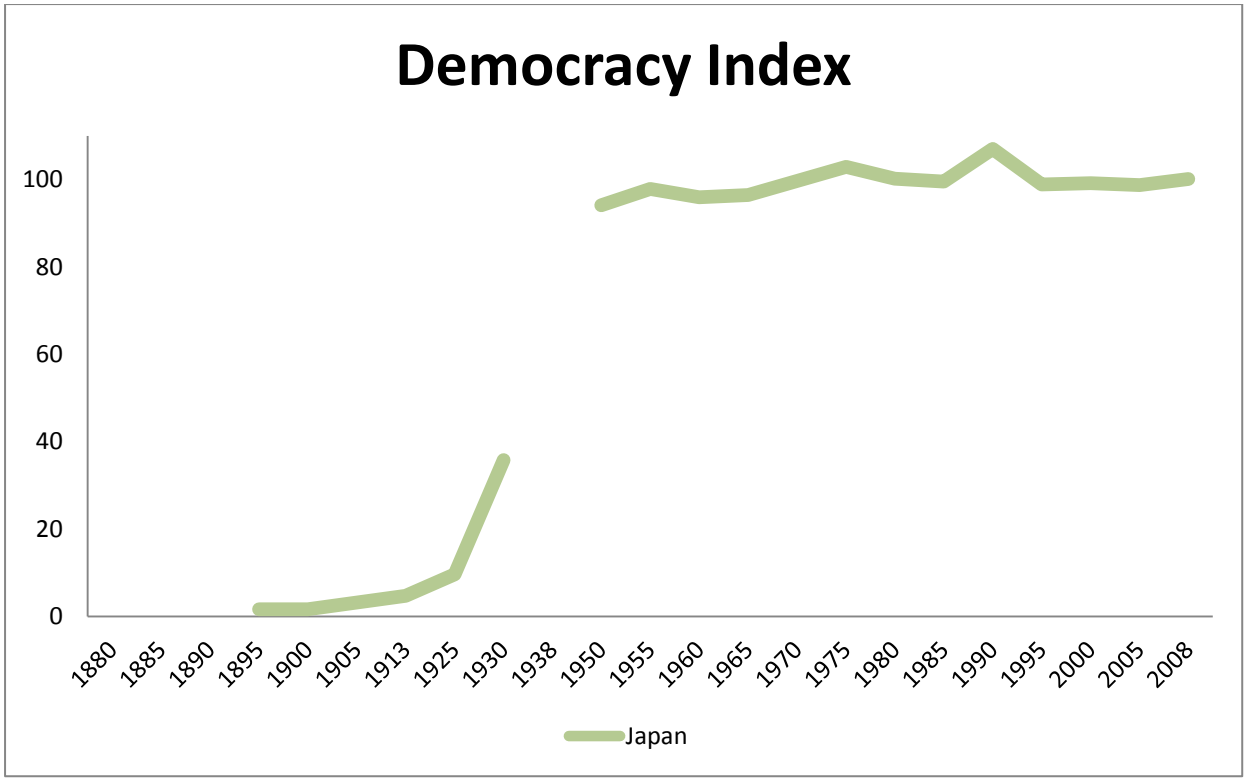
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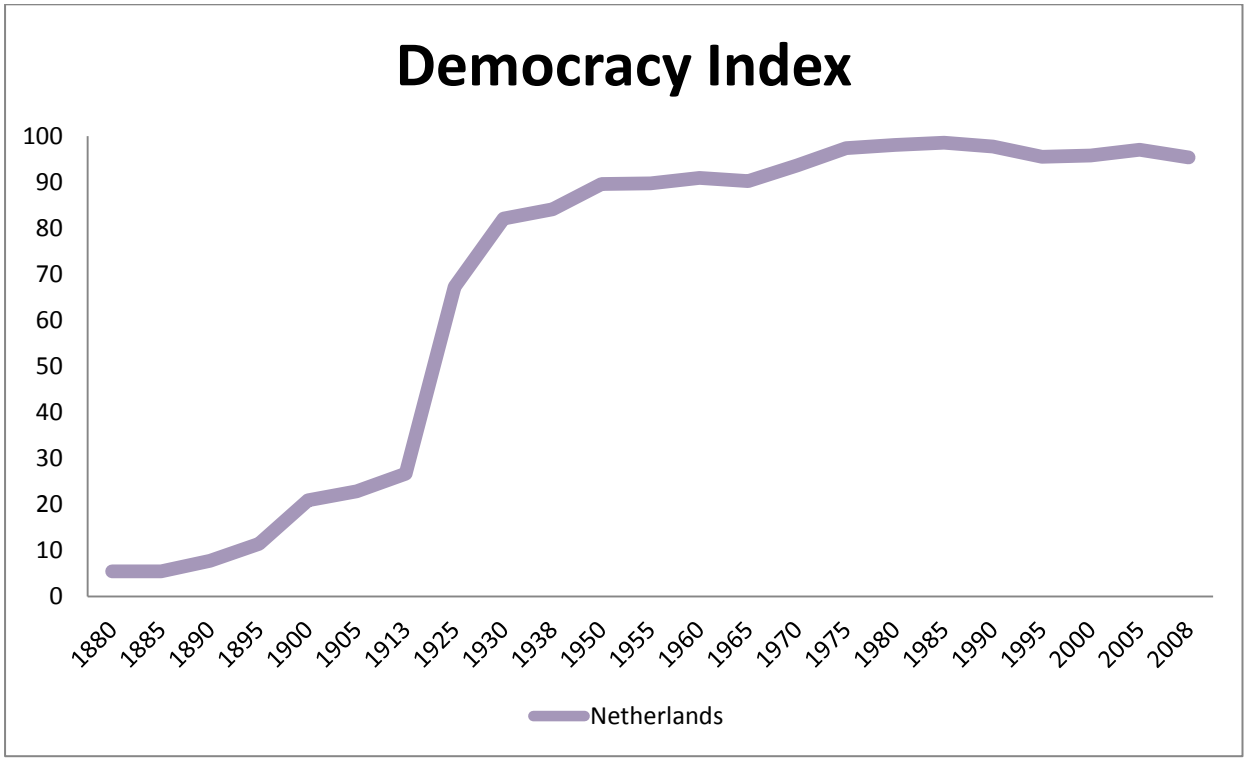
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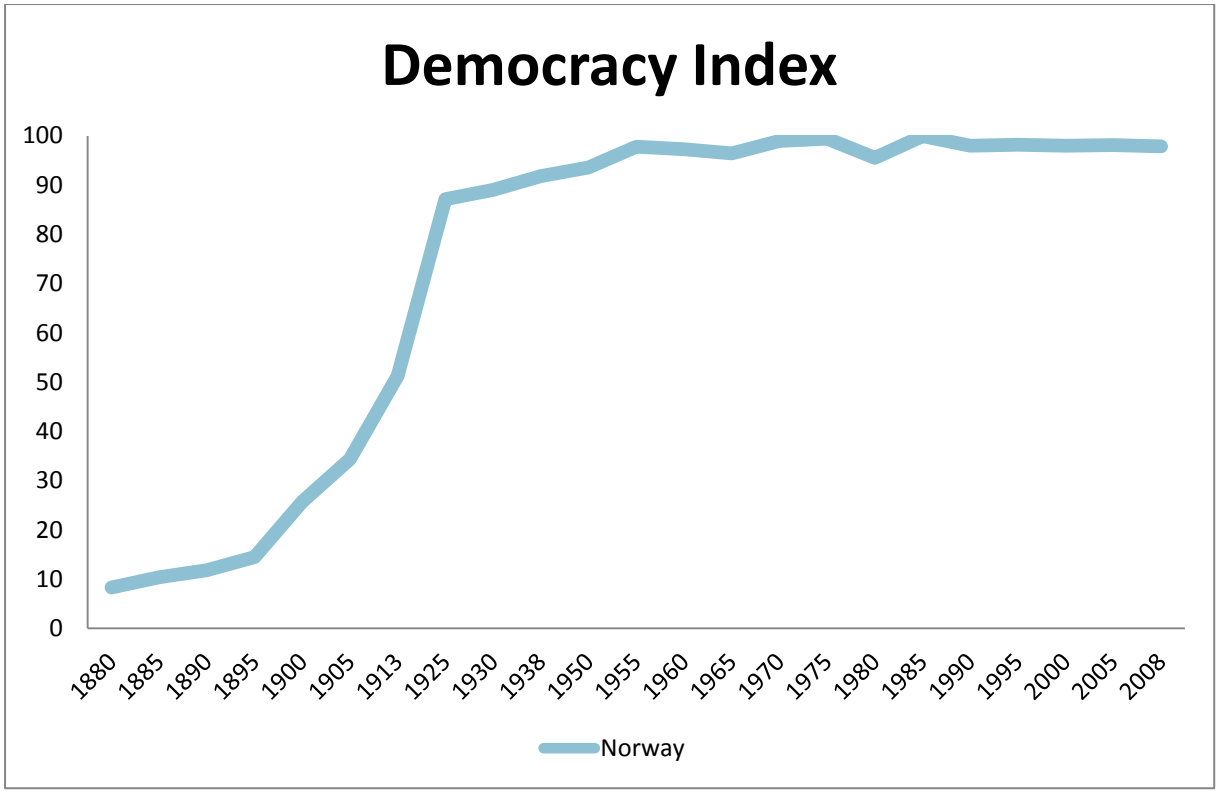
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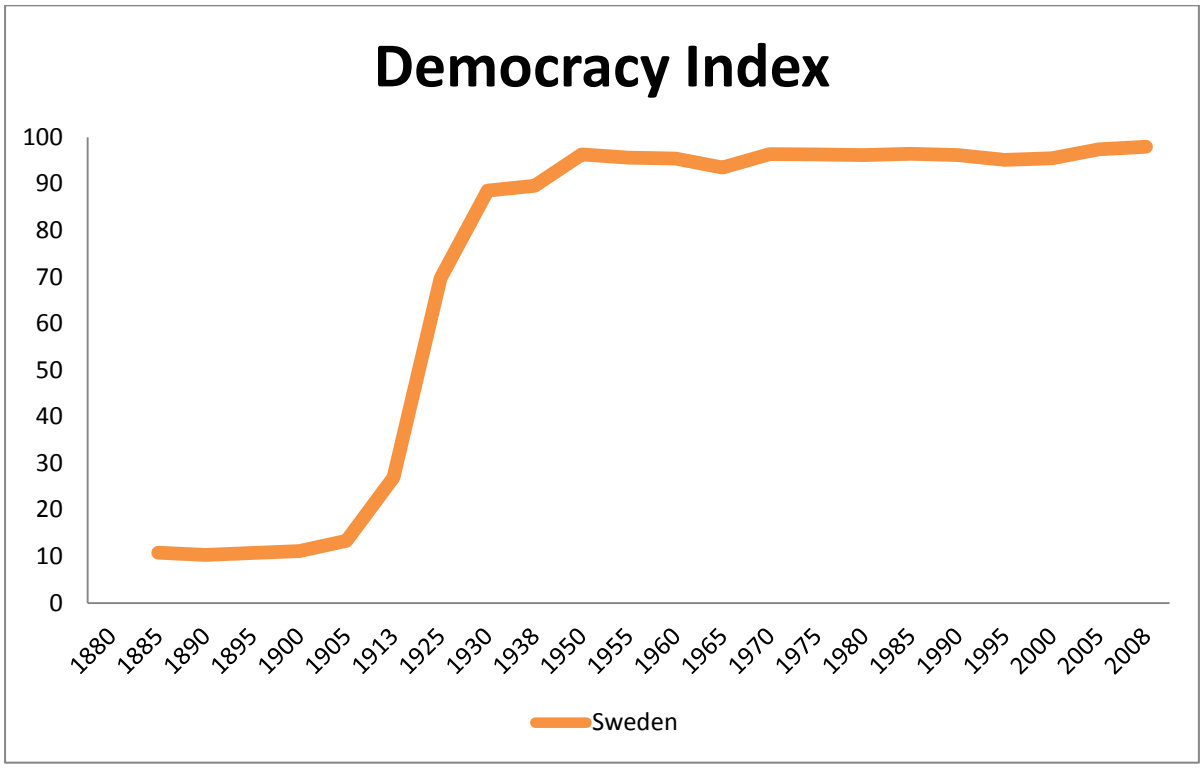
Democracy Index
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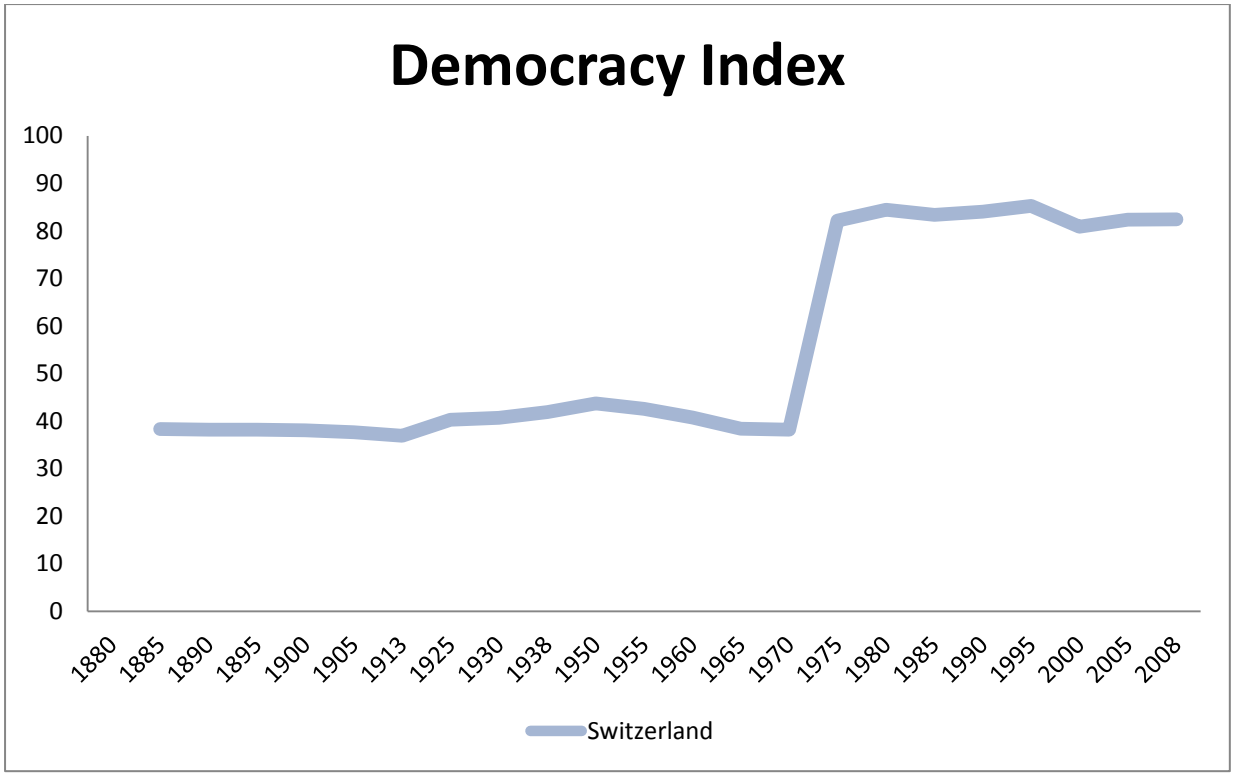
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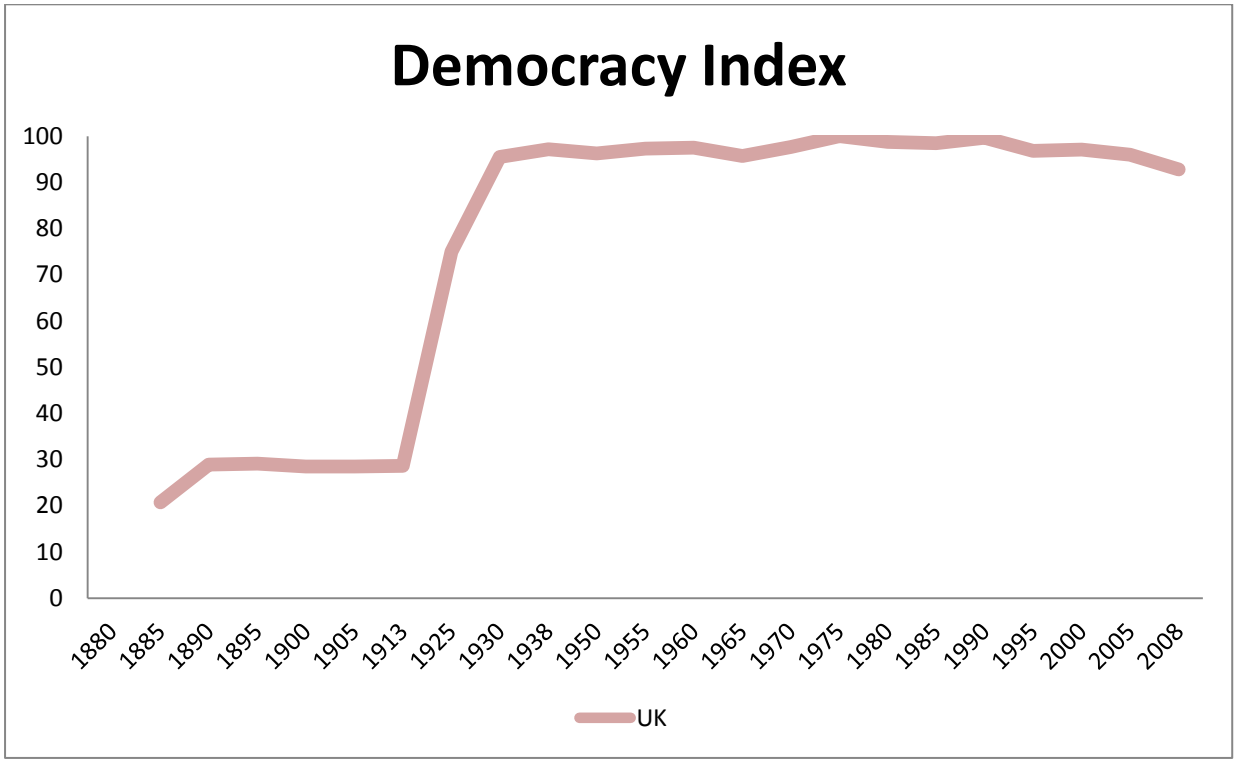
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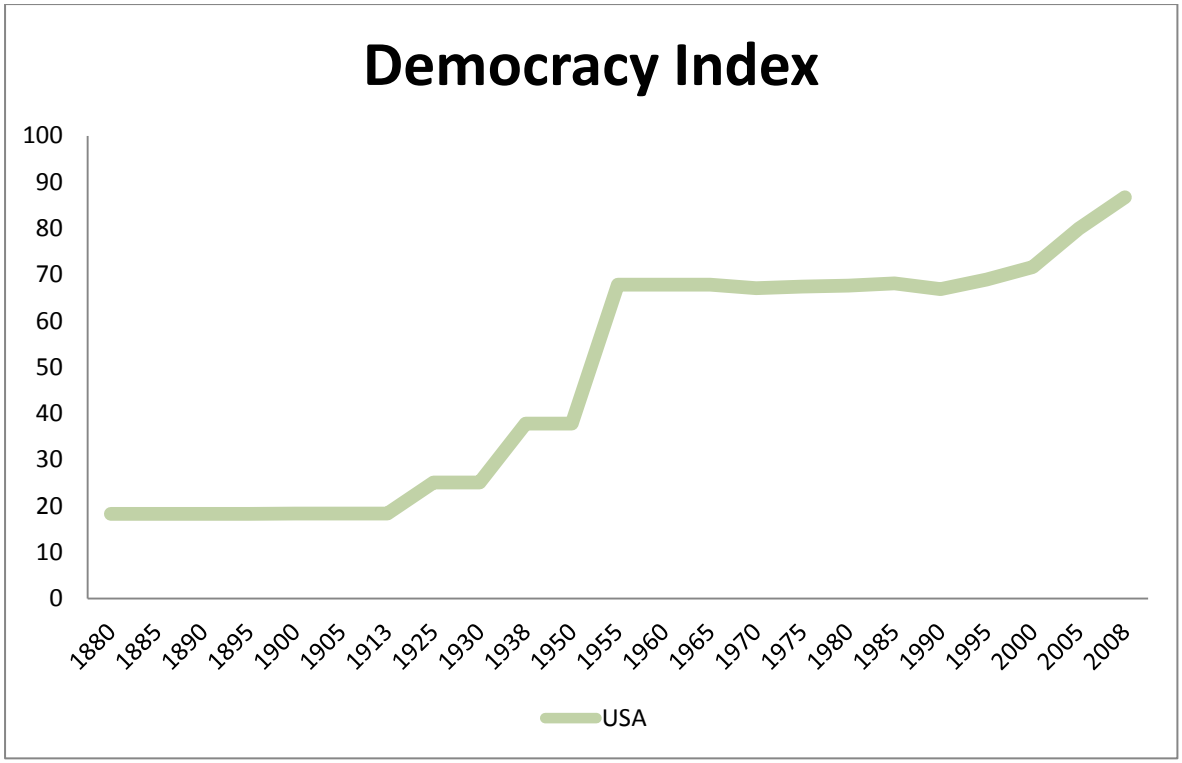
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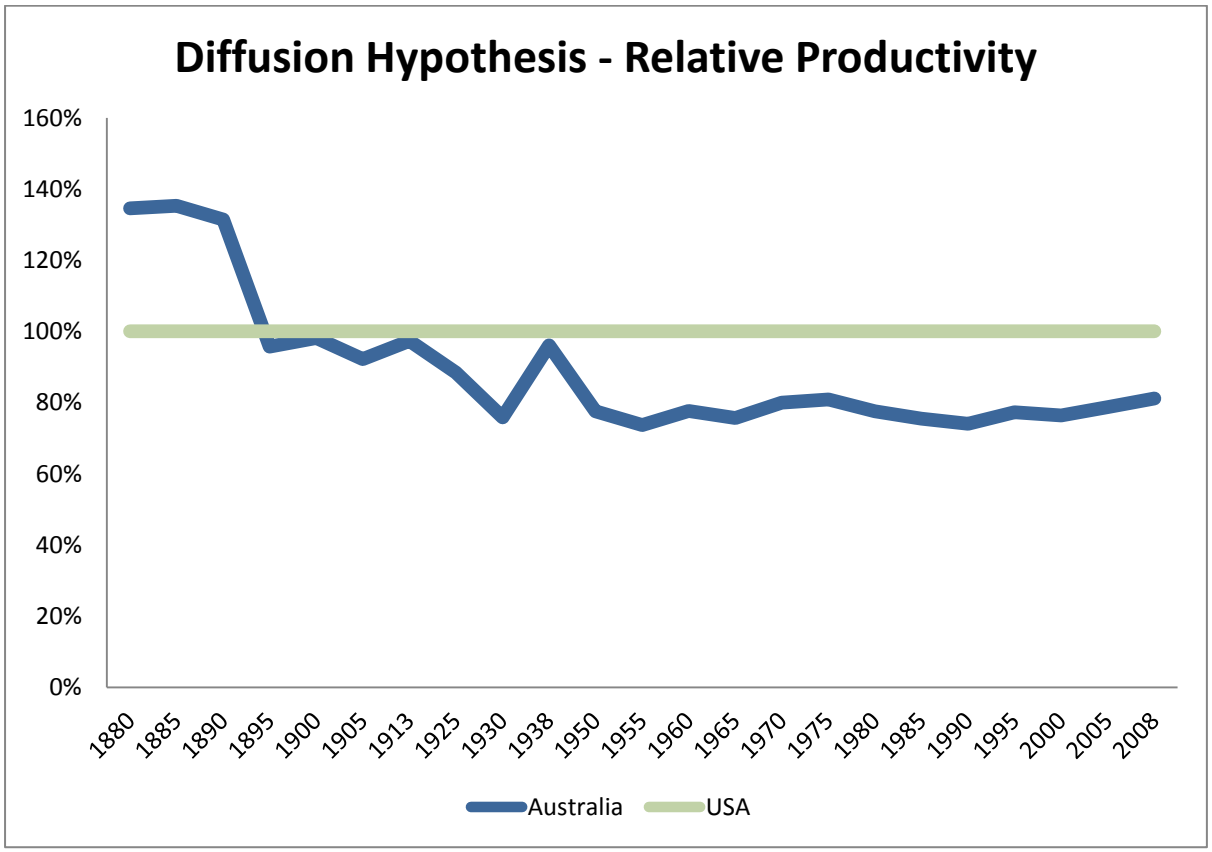
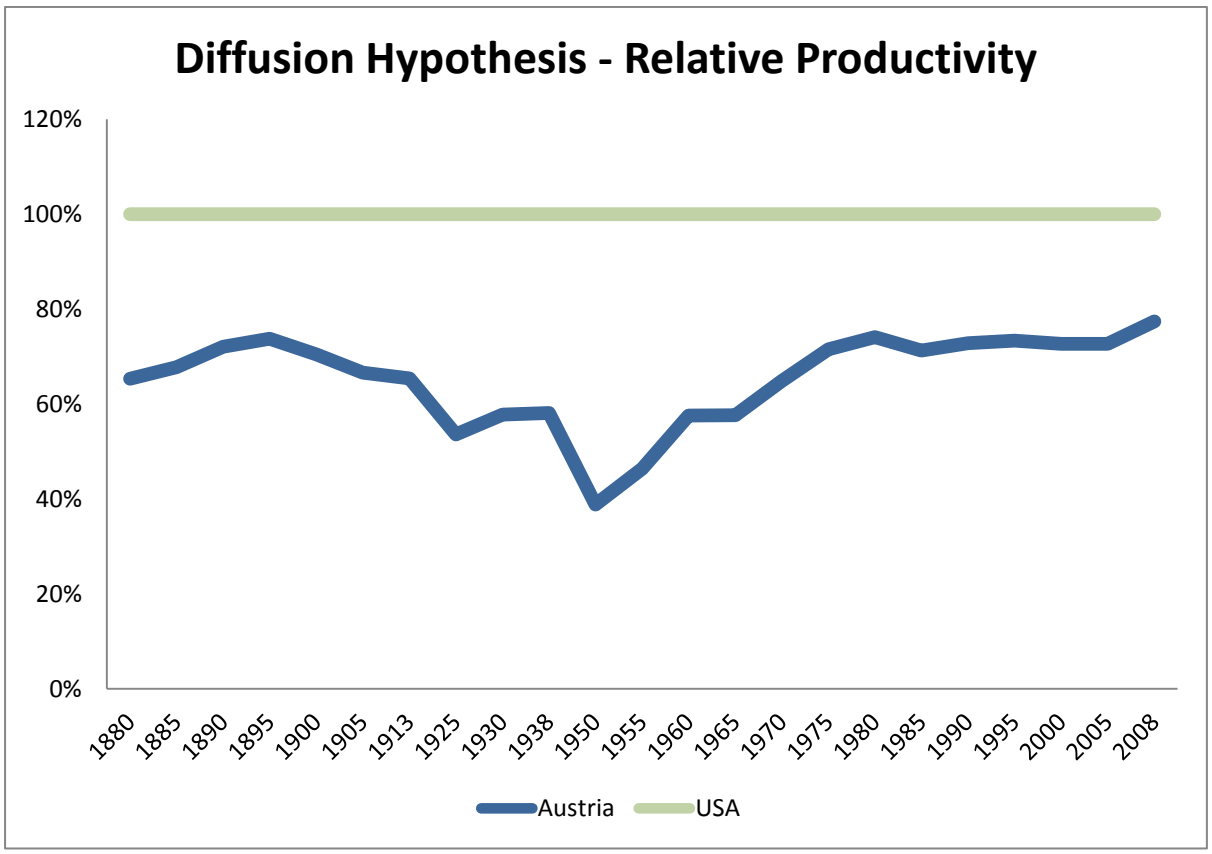
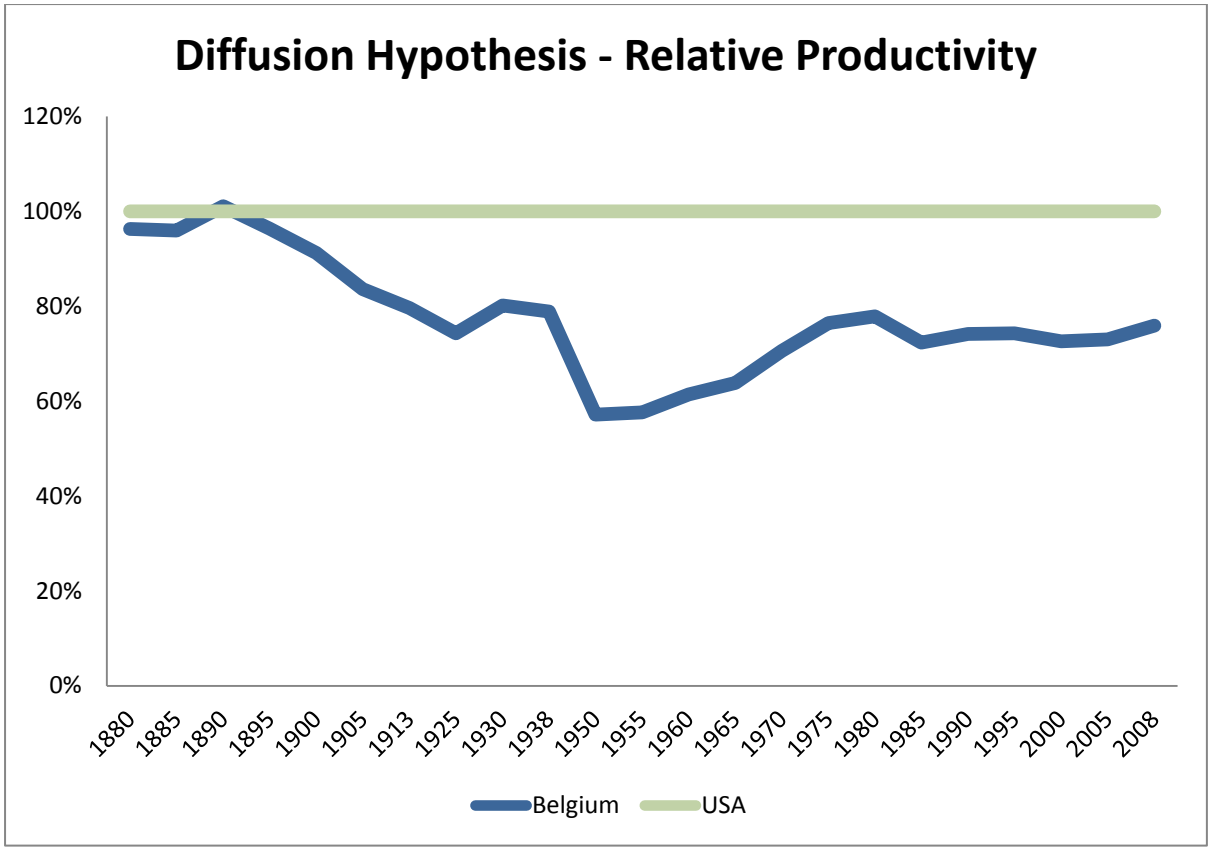
**APPENDIX 5.10**

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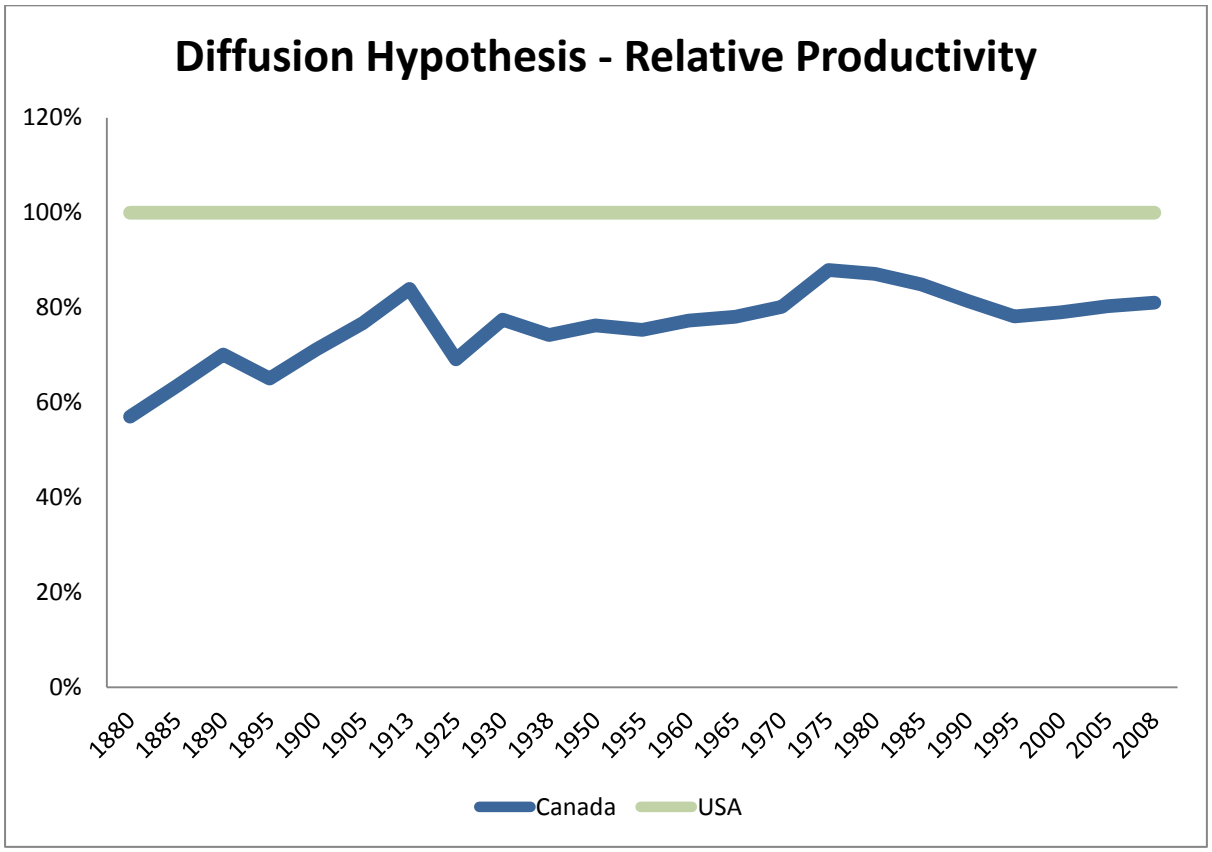
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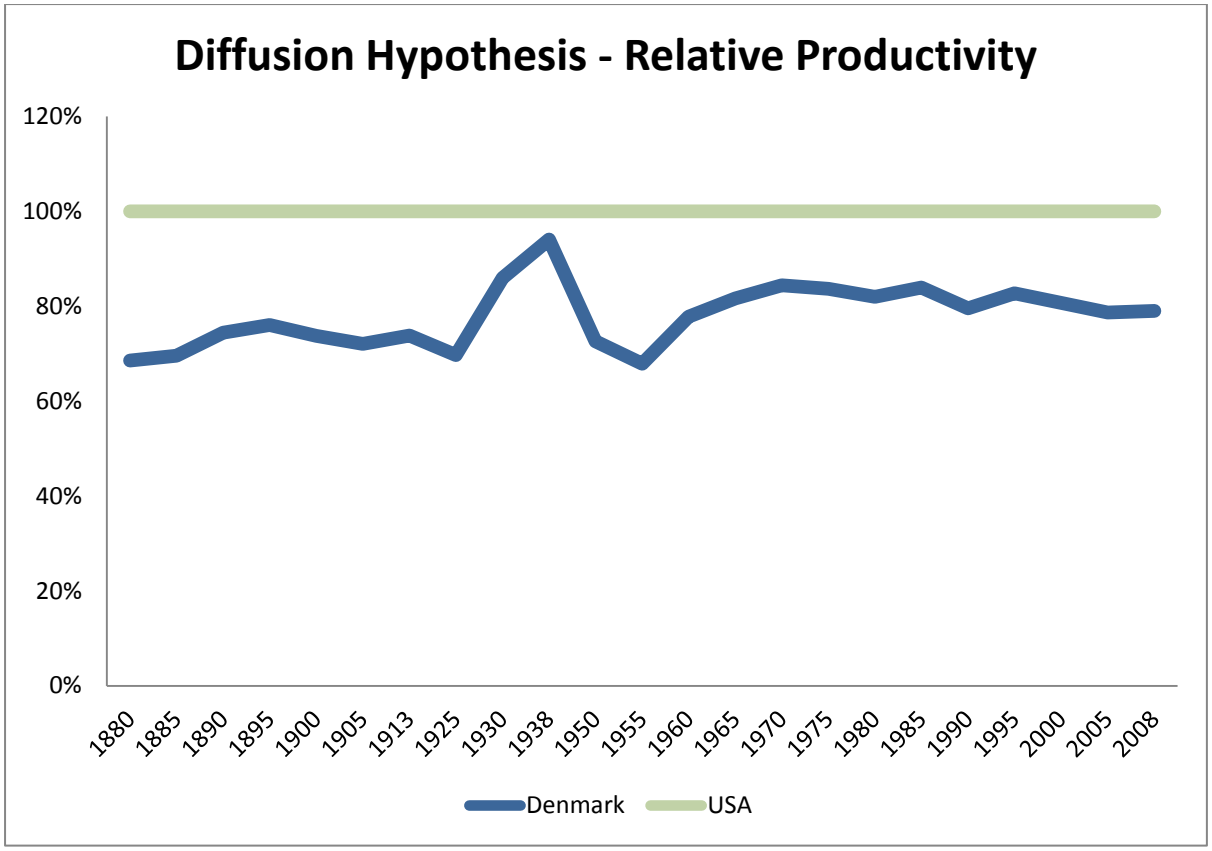
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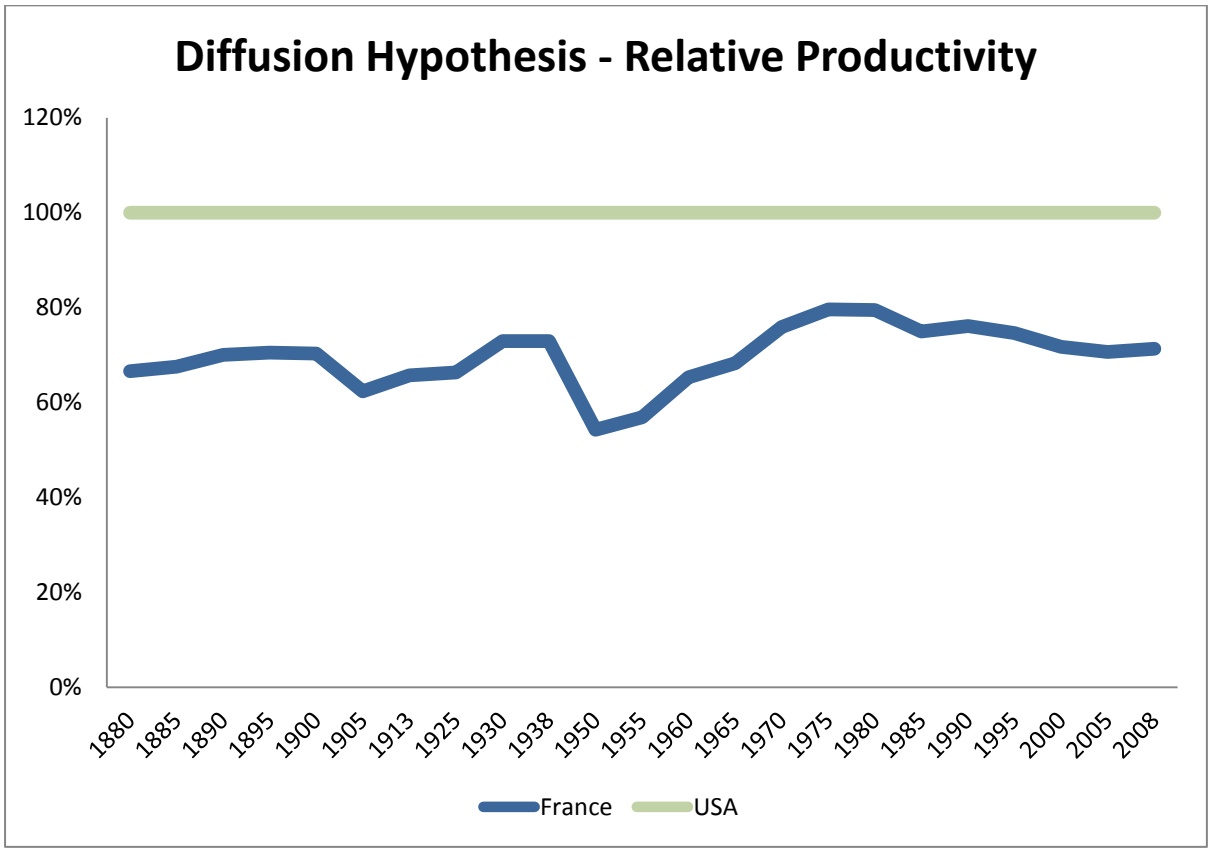
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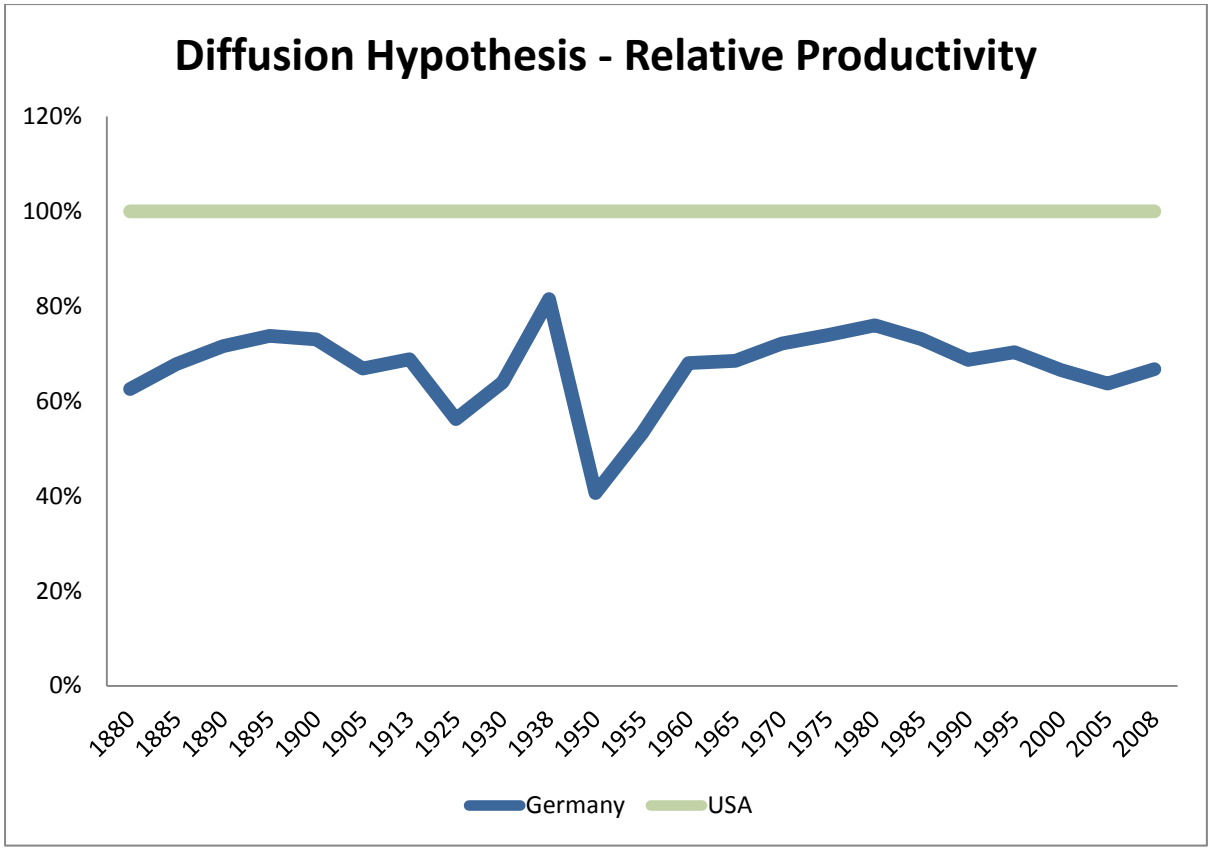
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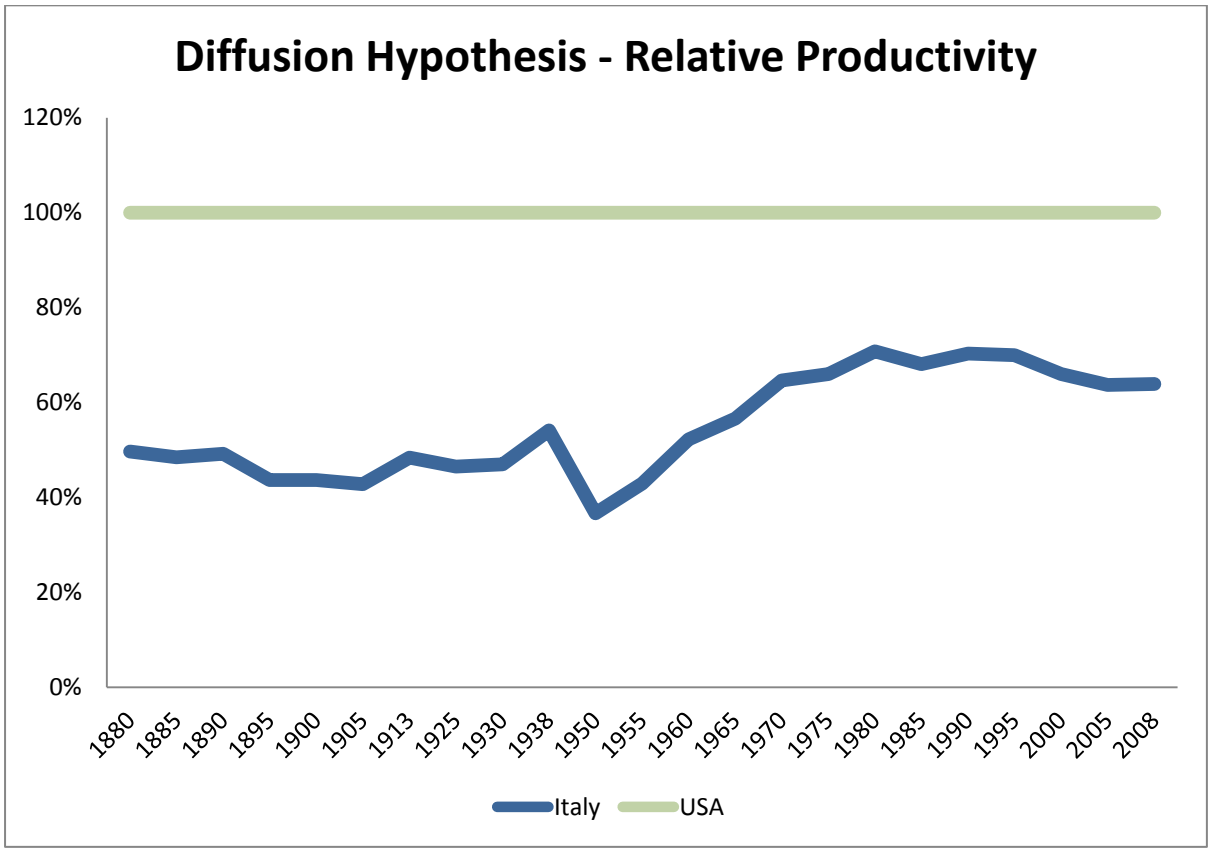
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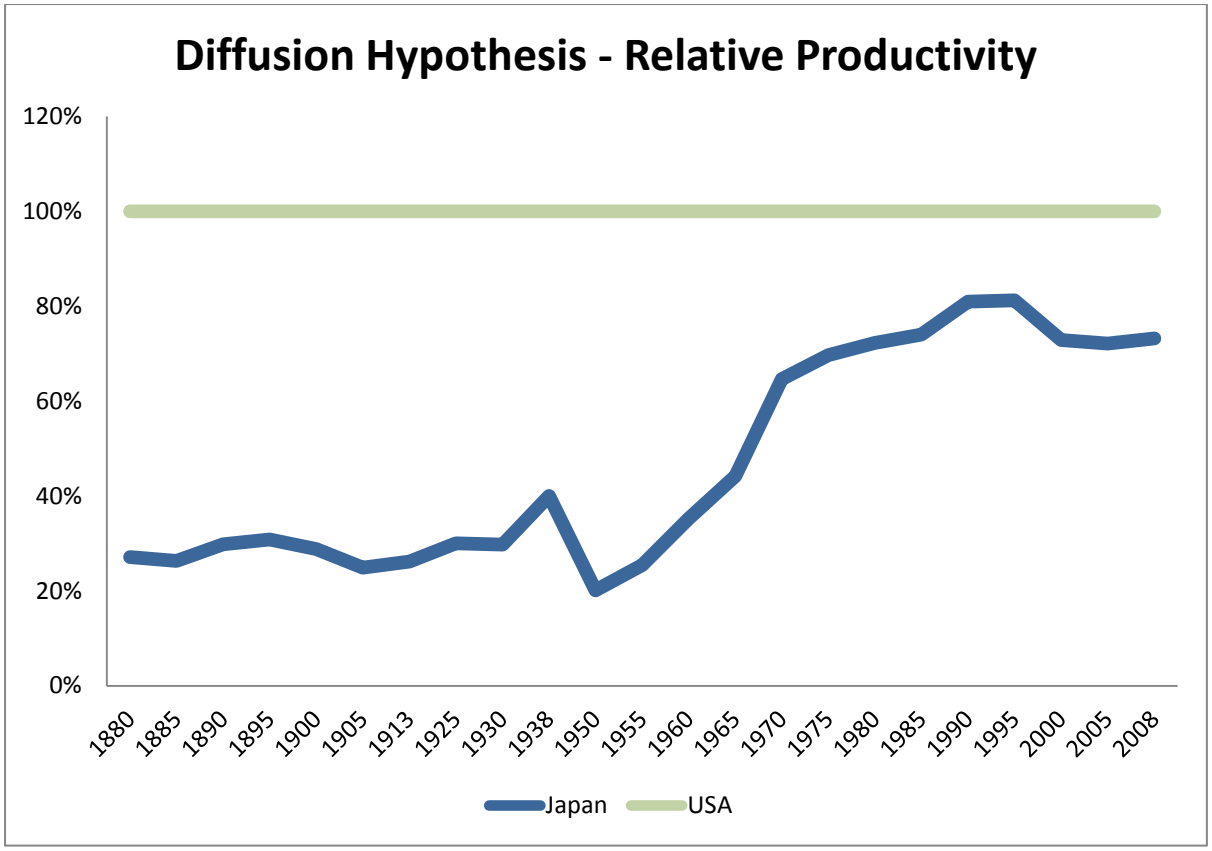
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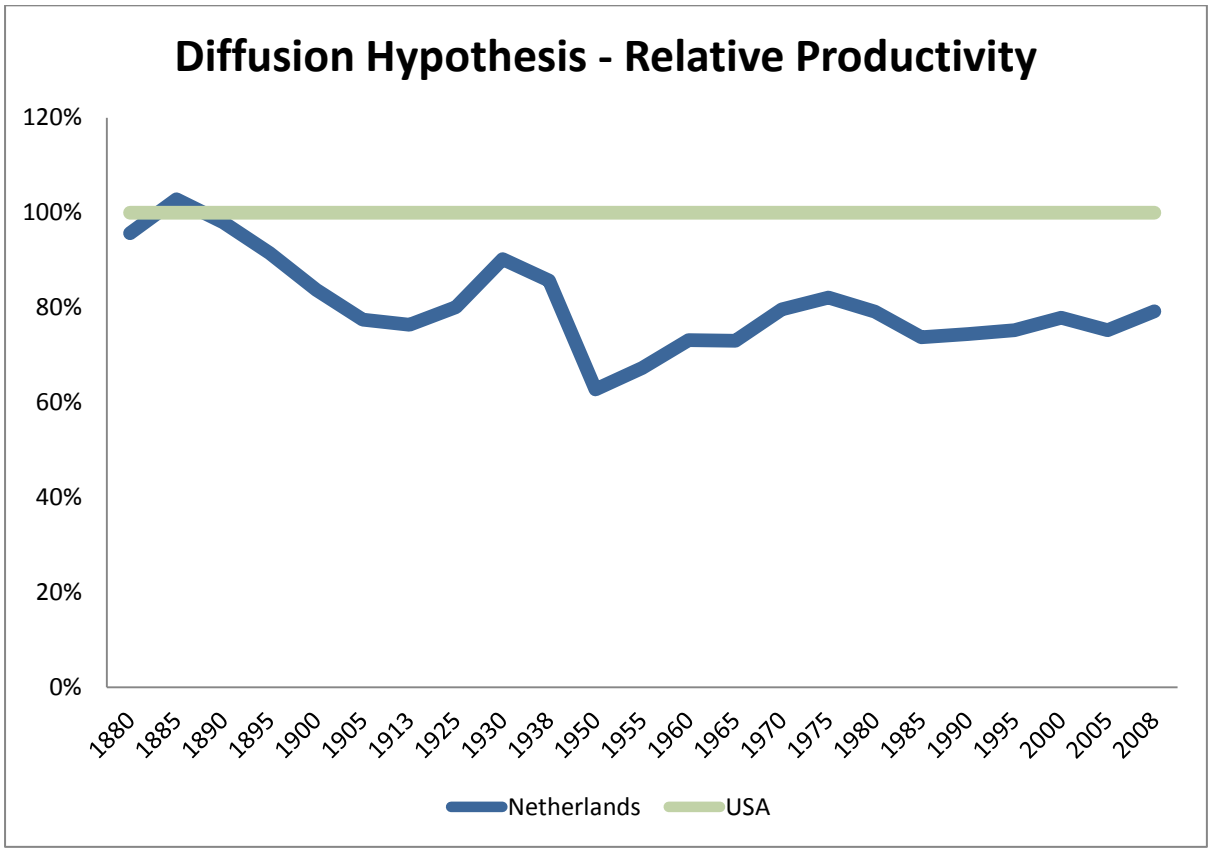
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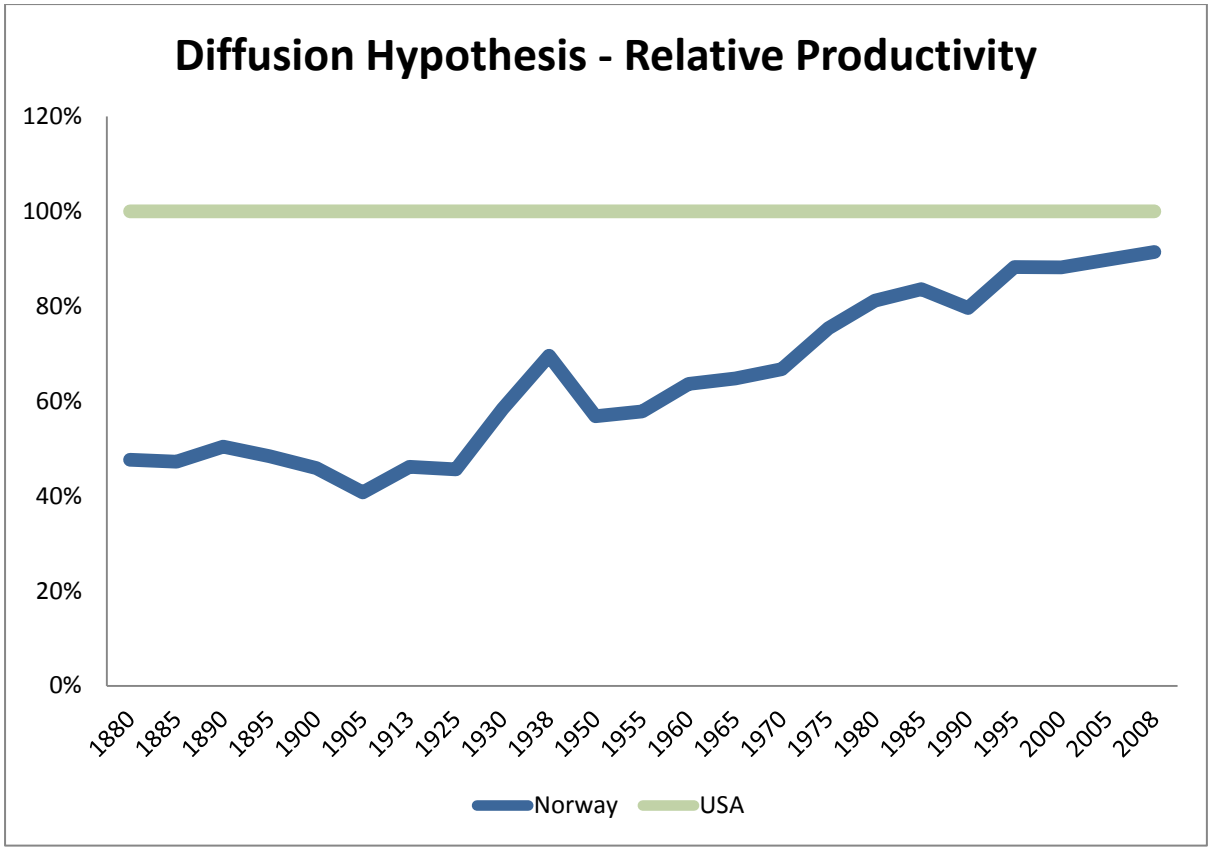
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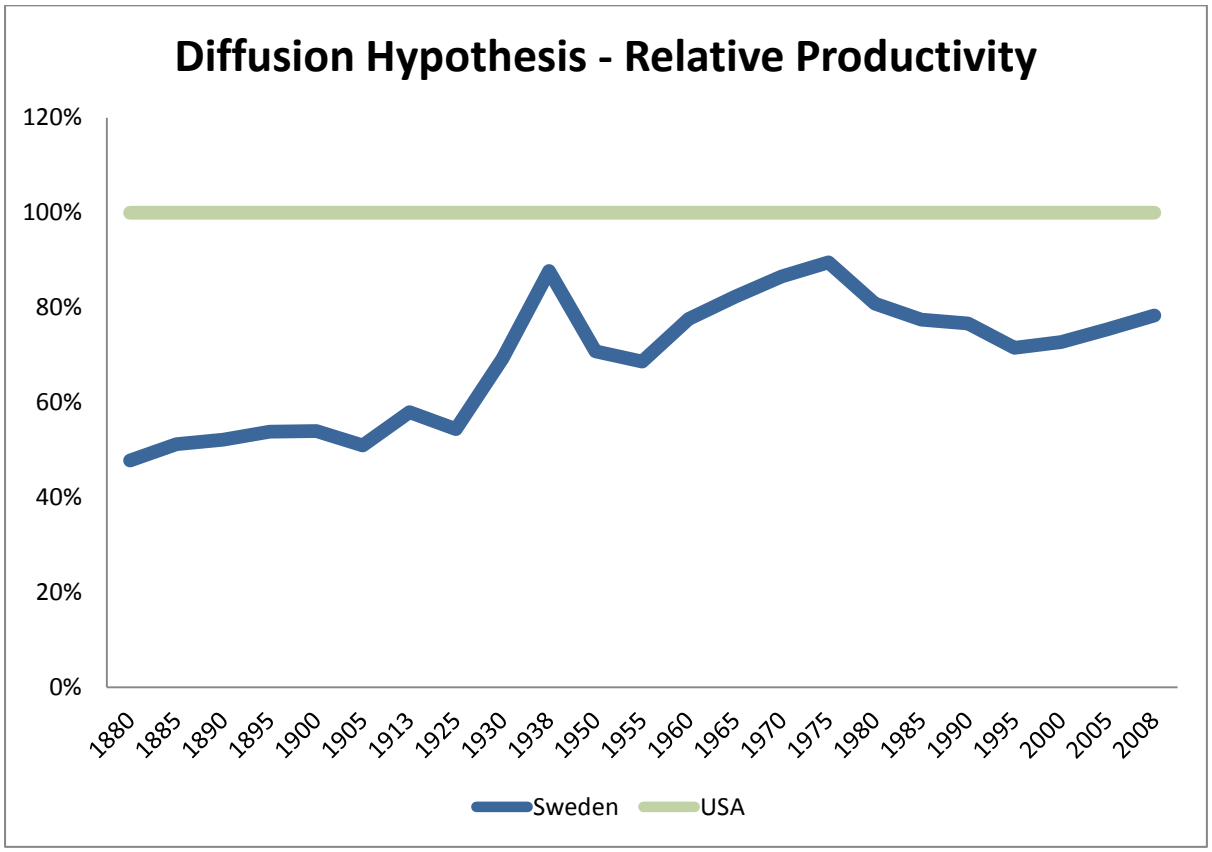
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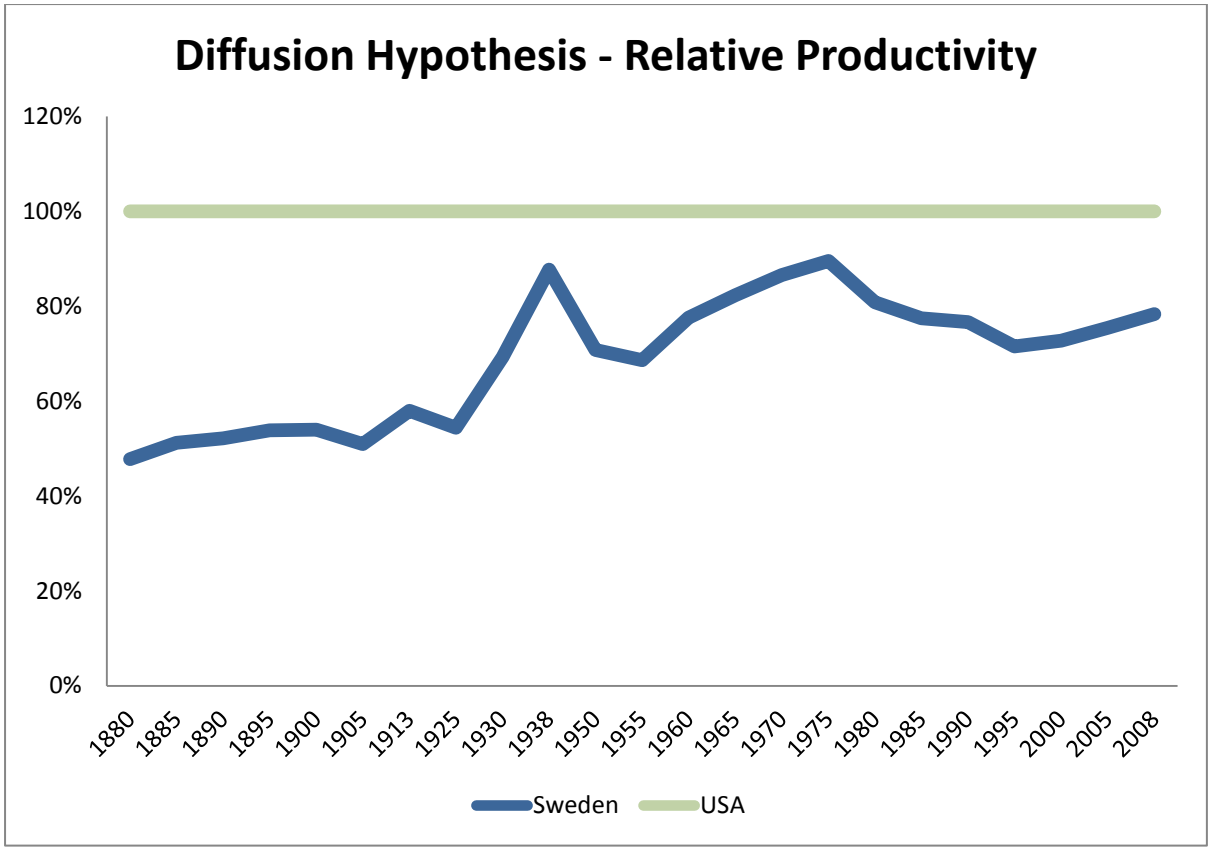
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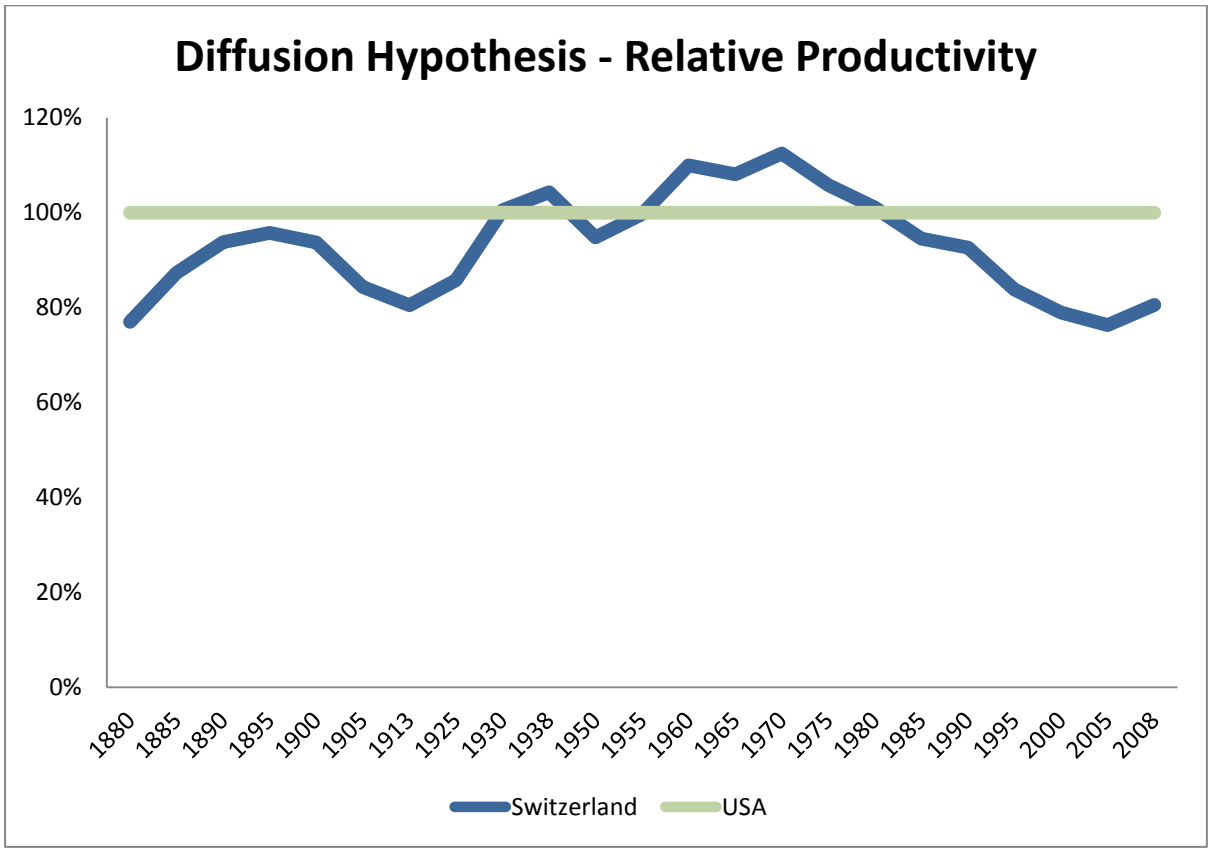
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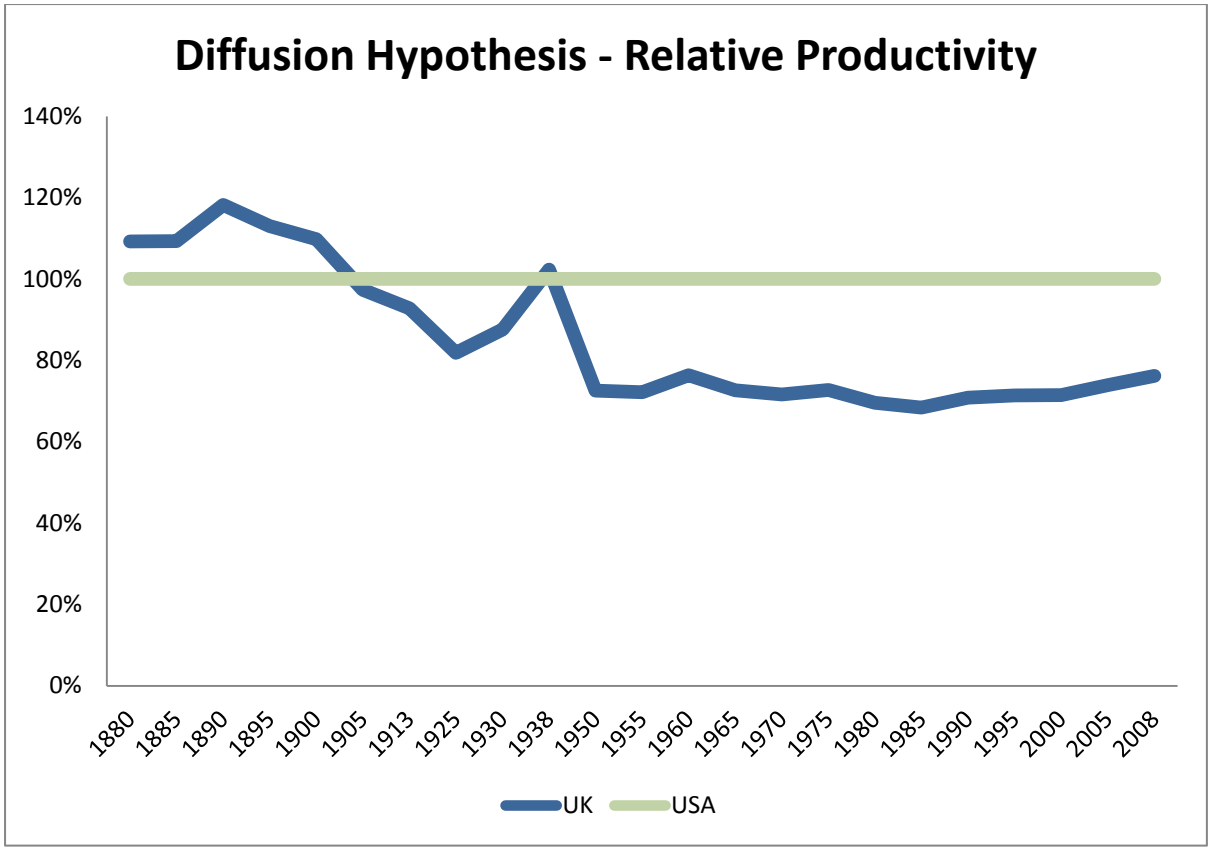
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## APPENDIX 5.11

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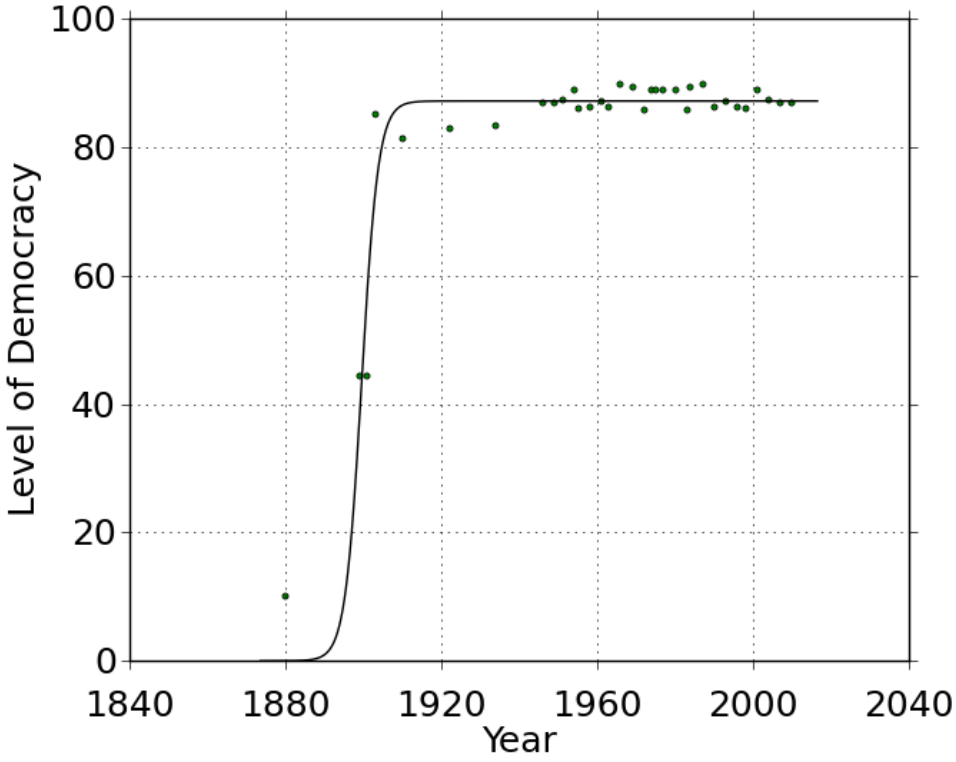


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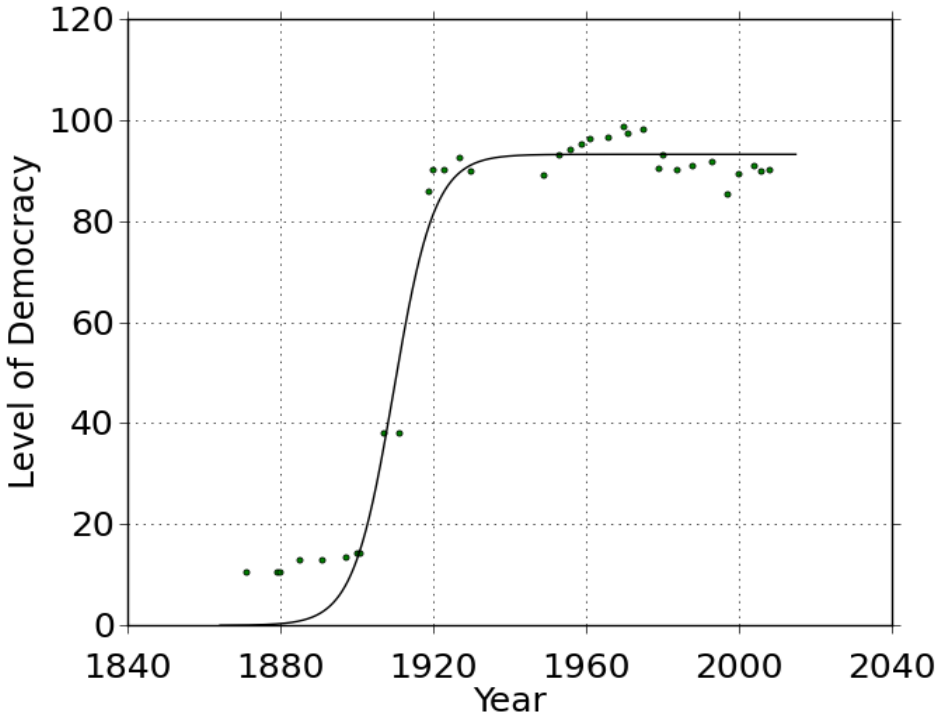

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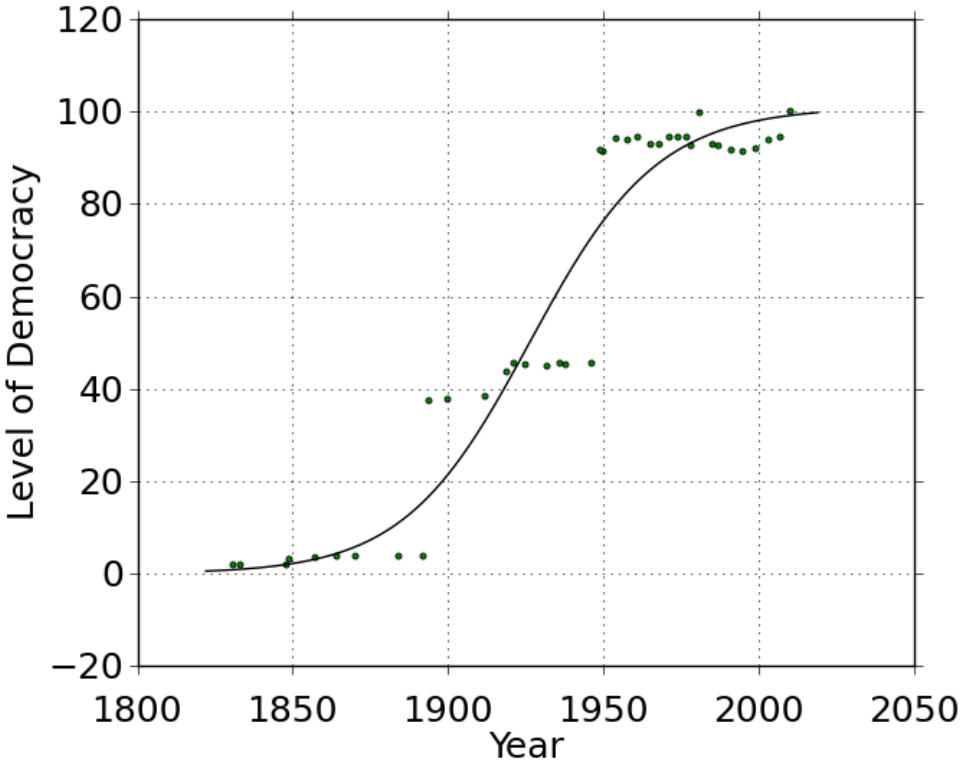


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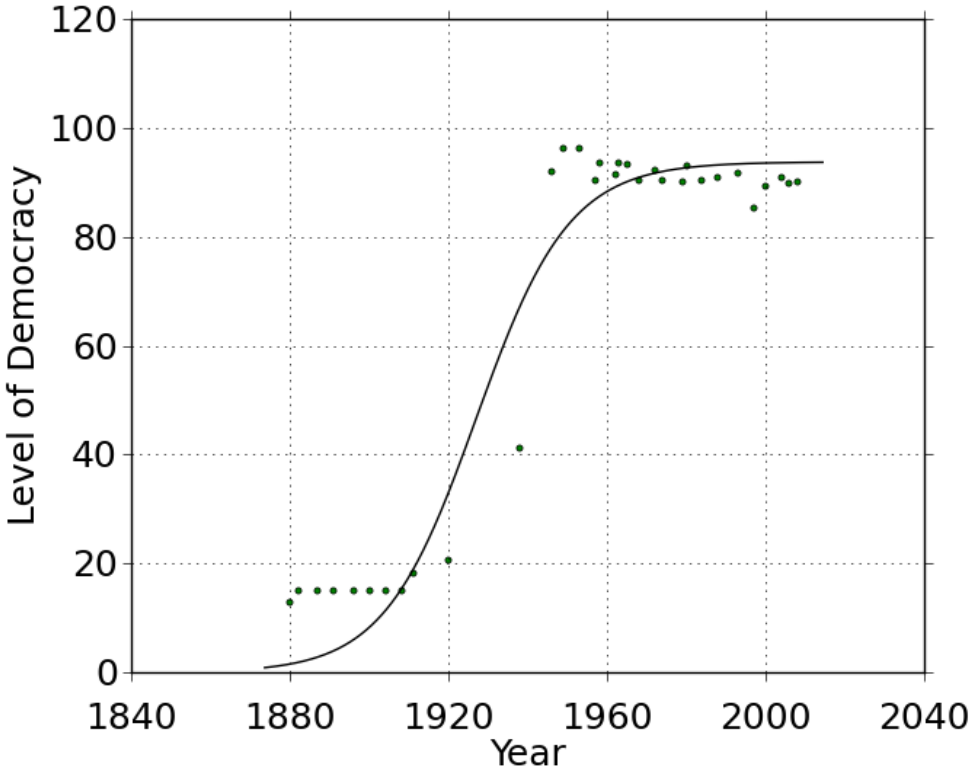

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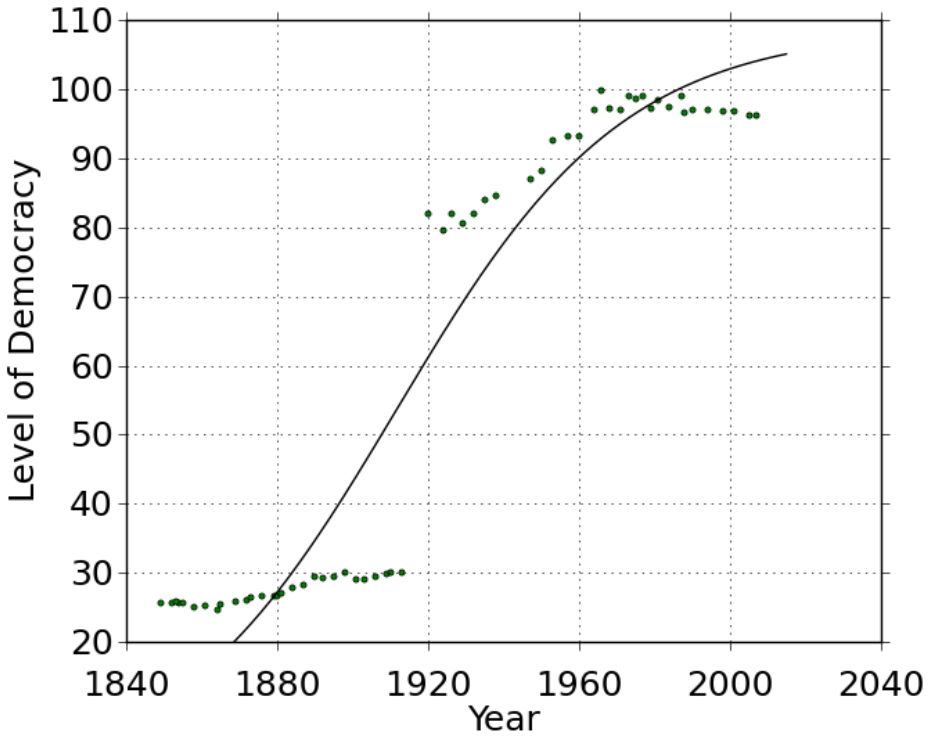


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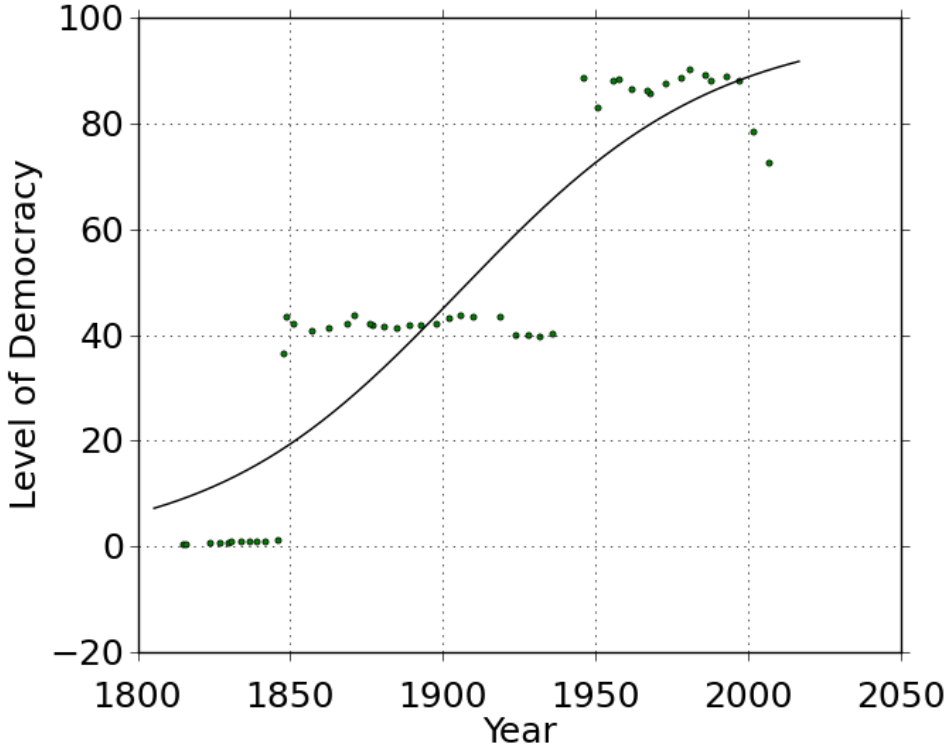

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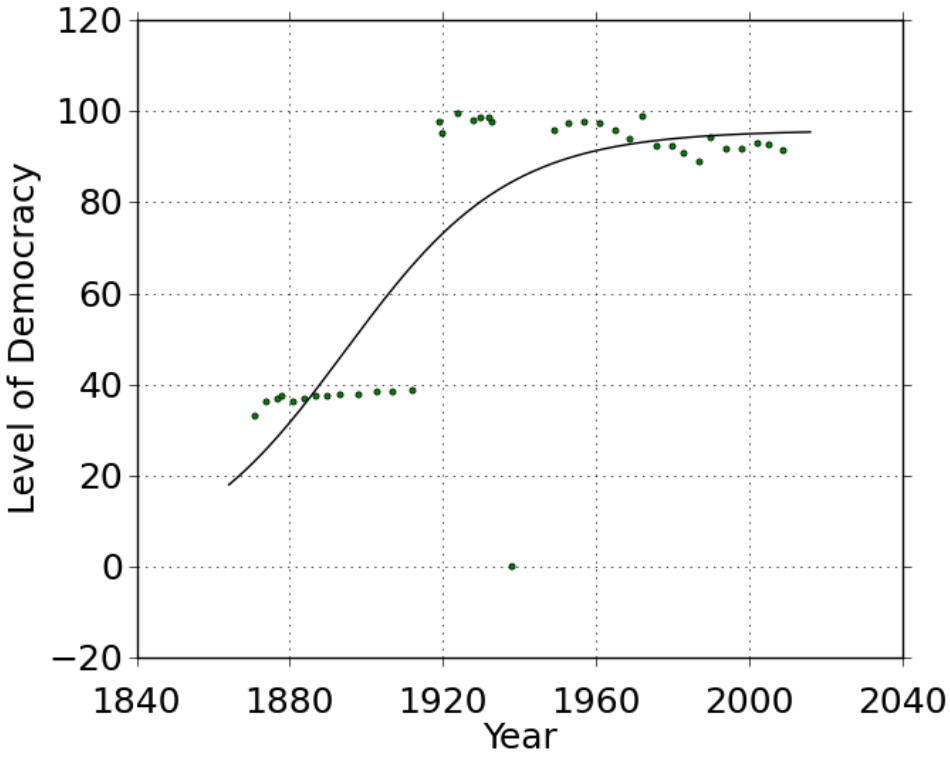


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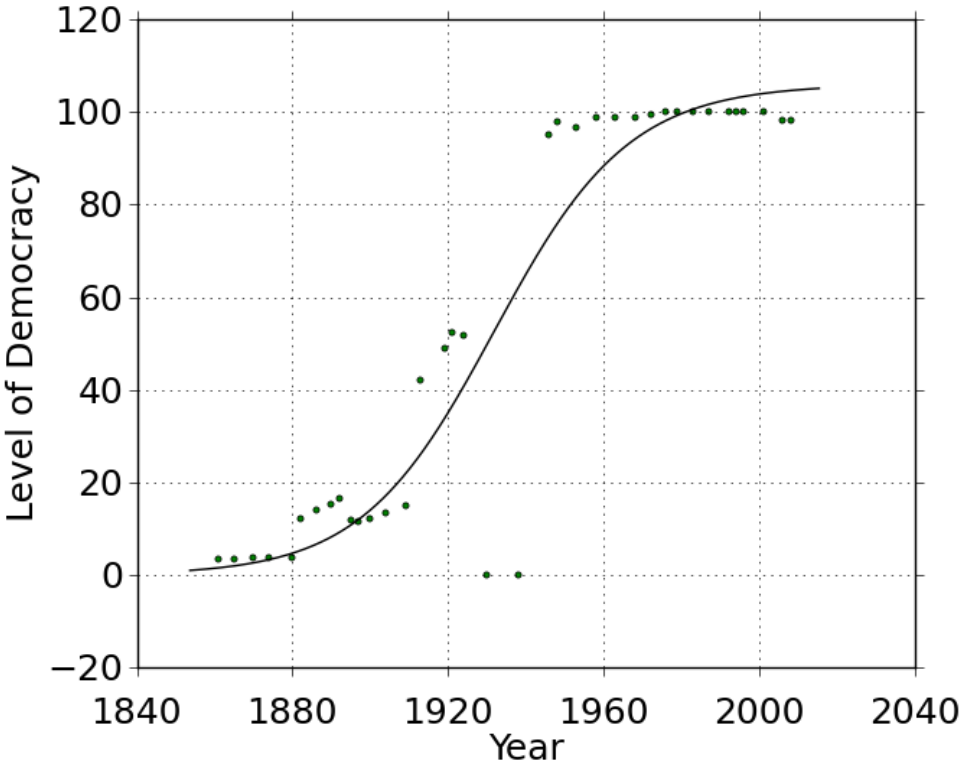

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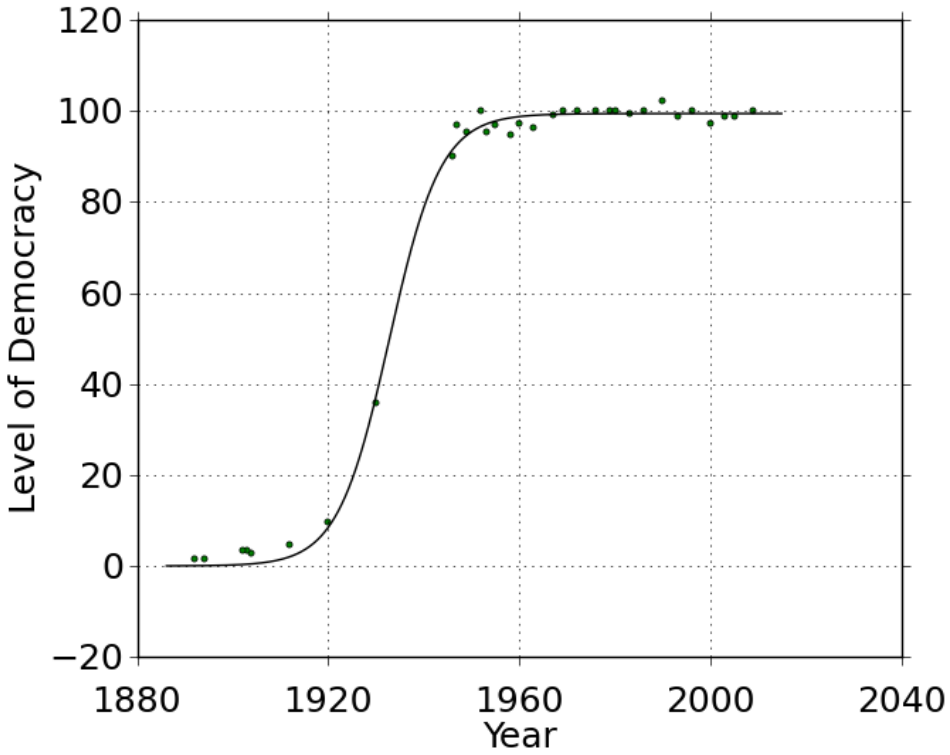


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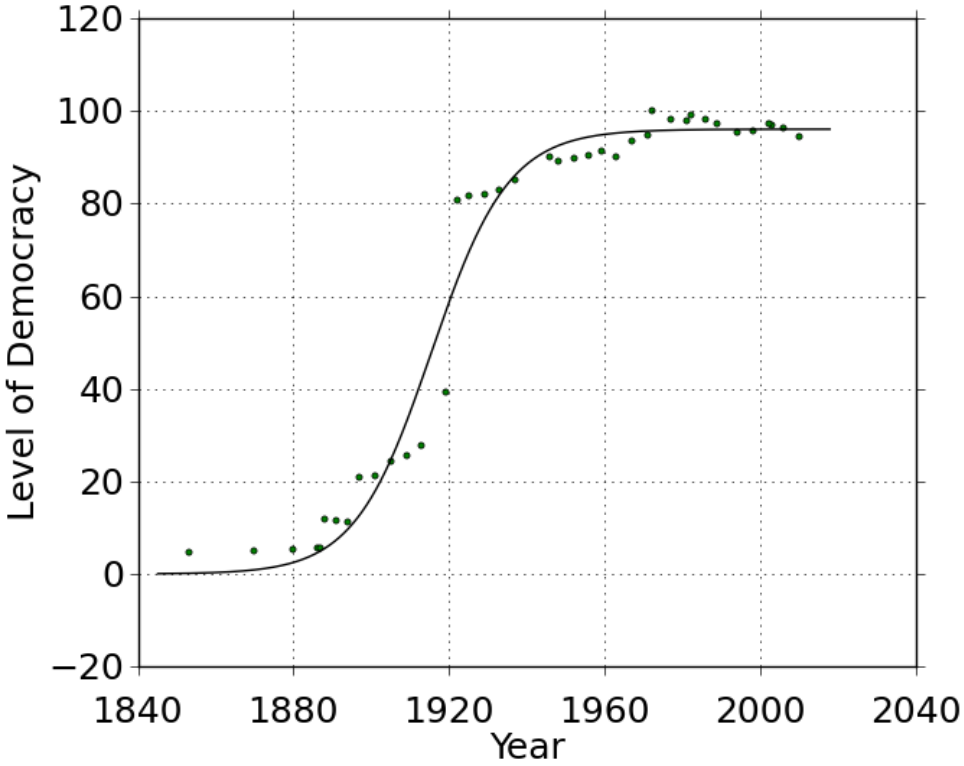

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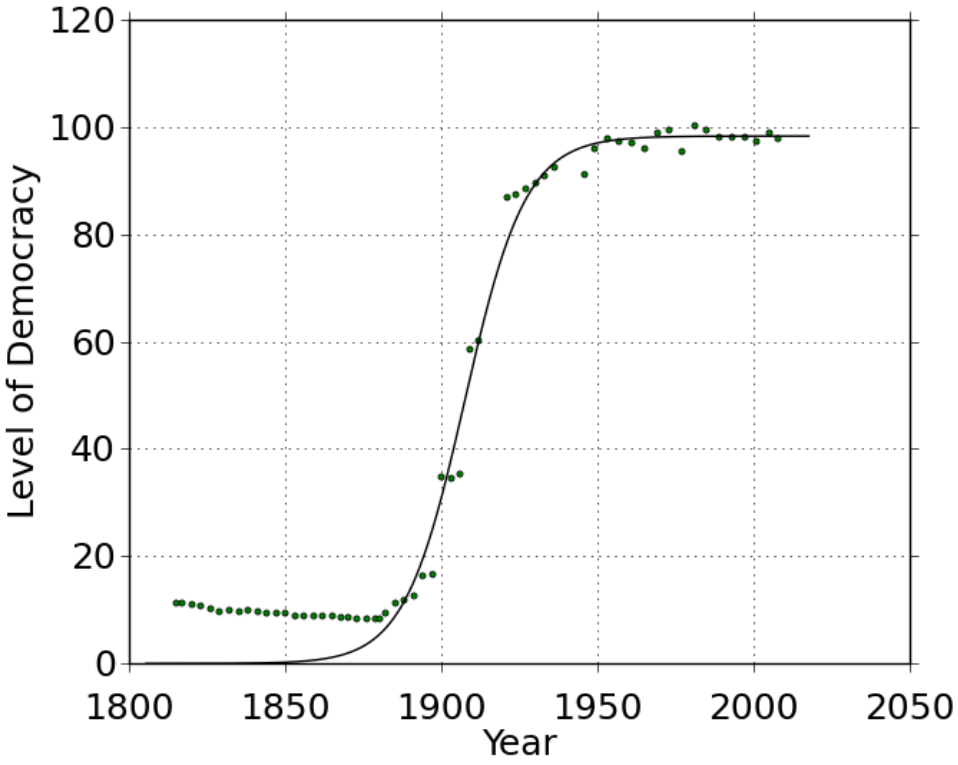


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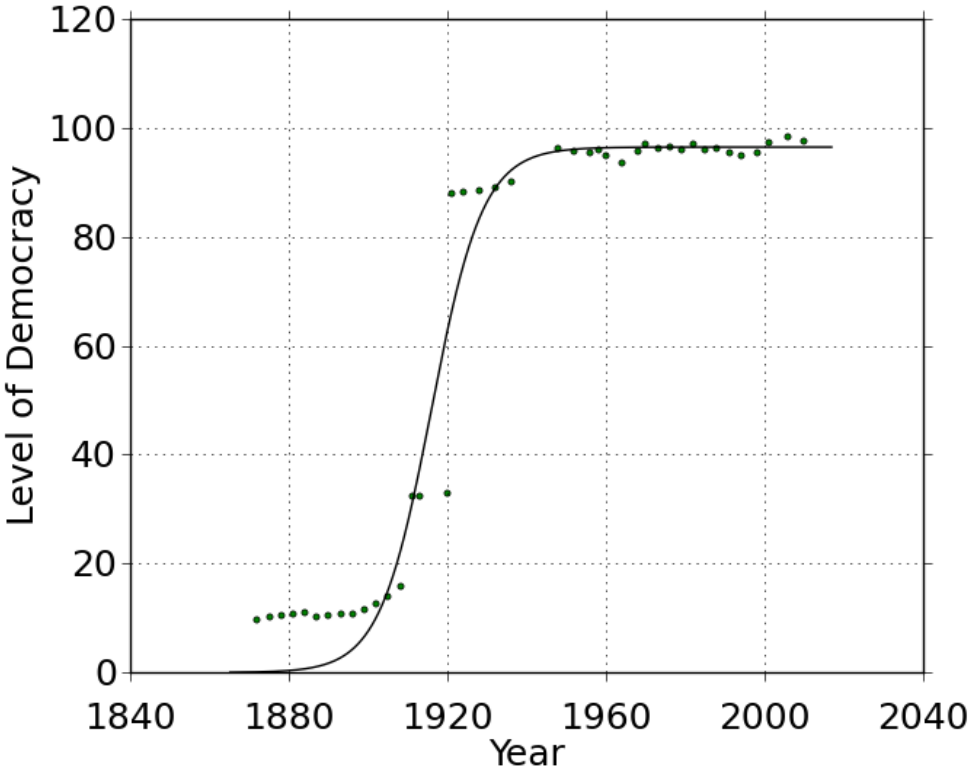


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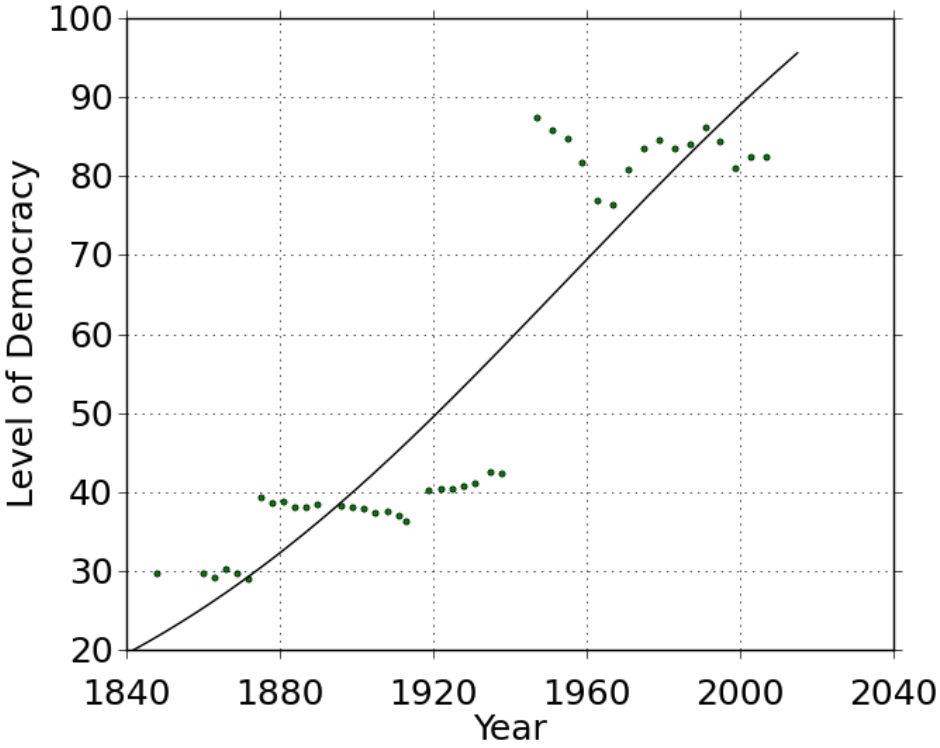


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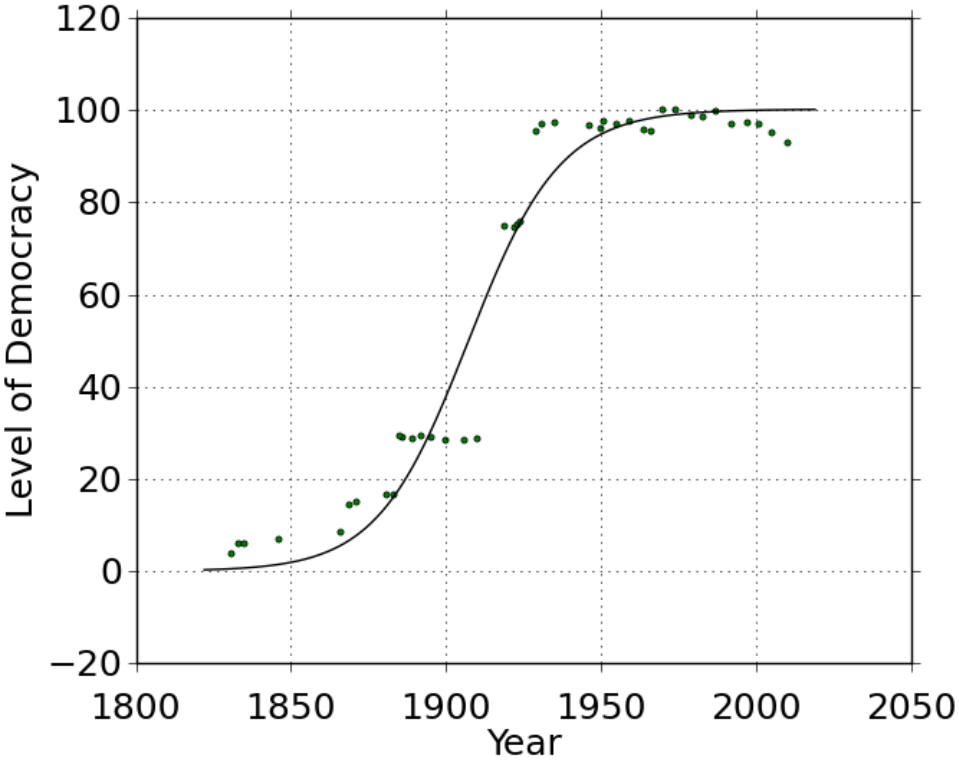
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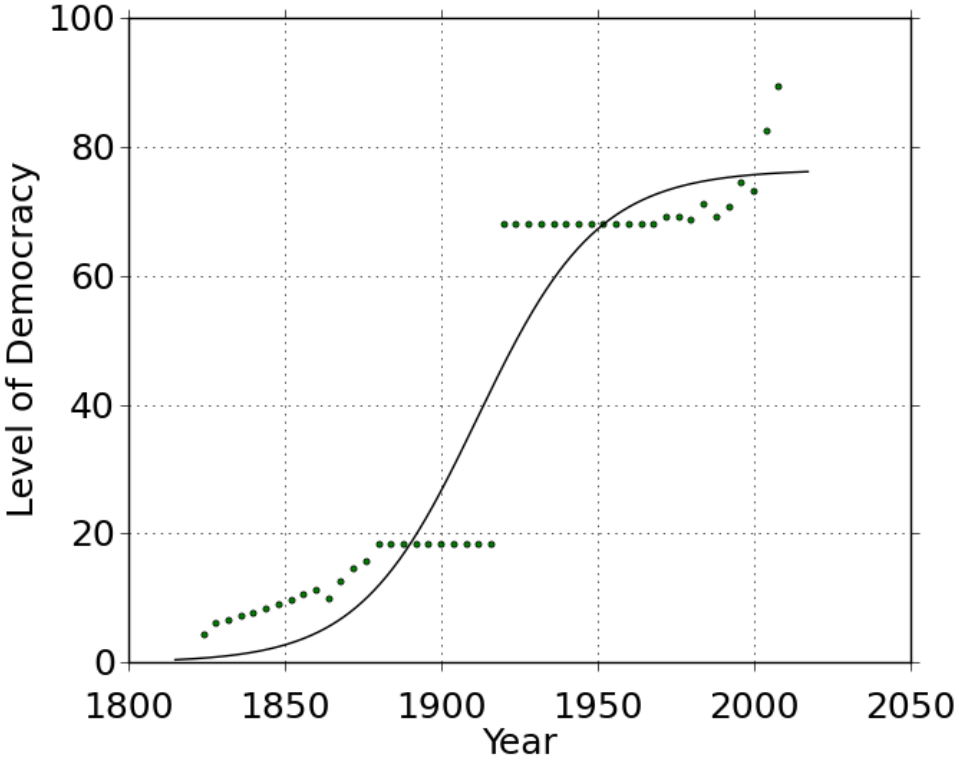
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**APPENDIX 6.1 Hausman Test (FLX)**

| VARIABLE | Coefficients (b) FE | (B) RE | (b-B) Difference | Sqrt(Diag(V_b-V-B)) SE |
|---|---|---|---|---|
| POPVOTE | 0.699 | 1.093 | -0.394 | 0.272 |
| ERA2 | -0.659 | -0.673 | 0.014 | 0.074 |
| ERA3 | 1.758 | 1.816 | -0.058 | |
| DURABLE | -0.007 | -0.005 | -0.001 | 0.003 |
| DISNAT | 1.610 | 0.265 | 1.345 | 0.473 |
| DISOCC | 0.306 | 0.014 | 0.292 | 0.290 |
| DISREV | 0.507 | 0.022 | 0.485 | 0.455 |
| FREIGH | 0.000 | 0.007 | -0.006 | 0.006 |
| VOTECHG | 1.067 | 0.954 | 0.113 | |
| FLX | 0.007 | 0.006 | 0.000 | |

Test: Ho: Difference in Coefficients not Systematic
chi²(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 3.70
Prob>chi² = 0.960

**APPENDIX 6.2 Variance Inflation Factor Test (FLX)**

| VARIABLE | VIF | 1/VIF |
|---|---|---|
| POPVOTE | 5.53 | 0.181 |
| DURABLE | 2.91 | 0.343 |
| DISOCC | 2.11 | 0.474 |
| DISREV | 1.66 | 0.602 |
| ERA3 | 1.60 | 0.626 |
| DISNAT | 1.57 | 0.636 |
| FREIGH | 1.50 | 0.669 |
| FLX | 1.47 | 0.681 |
| ERA2 | 1.30 | 0.768 |
| VOTECHG | 1.22 | 0.820 |
| MEAN VIF | 2.09 | |

**APPENDIX 6.3 Breusch-Pagan Lagrangian Multiplier Test (FLX)**

```
---------+-----------------------------------------------------------
ChgGDPCap [Country,t] = Xb + u[Country] + e[Country,t]

Estimated results:
         |                 Var             Sd = Sqrt(Var)
---------+-----------------------------------------------------------
ChgGDPCap |  0.028          1.673
e         |  0.017          1.288
u         |  0.001          0.340

Test:           Var(u)          =          0
                chi²(1)         =       3.36
                Prob > chi²     =      0.067
---------+-----------------------------------------------------------
```

**APPENDIX 6.4 Hausman Test (DEMFLX)**

| | Coefficients | | | |
|---|---|---|---|---|
| | (b) | (B) | (b-B) | Sqrt(Diag(V_b-V-B)) |
| VARIABLE | FE | RE | Difference | SE |
| POPVOTE | 0.853 | 1.296 | -0.443 | 0.258 |
| ERA2 | -0.827 | -0.869 | 0.041 | 0.051 |
| ERA3 | 1.706 | 1.758 | -0.051 | |
| DURABLE | -0.005 | -0.005 | 0.000 | 0.003 |
| DISNAT | 1.505 | 0.312 | 1.193 | 0.473 |
| DISOCC | 0.436 | -0.004 | 0.440 | 0.314 |
| DISREV | 0.357 | 0.037 | 0.320 | 0.460 |
| FREIGH | 0.000 | 0.007 | -0.006 | 0.005 |
| VOTECHG | 0.841 | 0.691 | 0.151 | |
| DEMLFX | 0.009 | 0.000 | 0.002 | 0.001 |

Test: Ho: Difference in Coefficients not Systematic
chi²(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 6.42
Prob>chi² = 0.779

**APPENDIX 6.5 Variance Inflation Factor Test (DEMFLX)**

| VARIABLE | VIF | 1/VIF |
|---|---|---|
| POPVOTE | 5.55 | 0.181 |
| DURABLE | 3.08 | 0.343 |
| DEMFLX | 2.20 | 0.474 |
| DISOCC | 2.10 | 0.474 |
| ERA3 | 1.62 | 0.626 |
| DISREV | 1.61 | 0.637 |
| DISNAT | 1.59 | 0.623 |
| ERA2 | 1.56 | 0.681 |
| FREIGHT | 1.52 | 0.768 |
| VOTECHG | 1.28 | 0.820 |
| MEAN VIF | 2.21 | |

**APPENDIX 6.6 Breusch-Pagan Lagrangian Multiplier Test (DEMFLX)**

```
---------+-------------------------------------------------------------
ChgGDPCap [Country,t] = Xb + u[Country] + e[Country,t]

Estimated results:
         |                 Var              Sd = Sqrt(Var)
---------+-------------------------------------------------------------
ChgGDPCap |  0.028                    1.673
e         |  0.016                    1.279
u         |  0.002                    0.402

Test:           Var(u)          =         0
                chi²(1)         =      5.84
                Prob > chi²     =     0.016
---------+-------------------------------------------------------------
```

**APPENDIX 6.7 Hausman Test (LOGCUR)**

| | Coefficients | | | |
|---|---|---|---|---|
| | (b) | (B) | (b-B) | Sqrt(Diag(V_b-V-B)) |
| VARIABLE | FE | RE | Difference | SE |
| POPVOTE | 0.550 | 0.843 | -0.294 | 0.267 |
| ERA2 | -0.709 | -0.691 | -0.018 | 0.079 |
| ERA3 | 1.728 | 1.768 | -0.041 | |
| DURABLE | -0.008 | -0.007 | -0.000 | 0.003 |
| DISNAT | 1.433 | 0.278 | 1.155 | 0.435 |
| DISOCC | 0.177 | -0.043 | 0.221 | 0.286 |
| DISREV | 0.451 | 0.029 | 0.422 | 0.449 |
| FREIGH | 0.000 | 0.006 | -0.006 | 0.005 |
| VOTECHG | 1.242 | 1.311 | -0.069 | |
| LOGCUR | -0.021 | -0.091 | 0.072 | 0.061 |

Test: Ho: Difference in Coefficients not Systematic
chi²(10) = (b-B)'[(V_b-V_B)^(-1)](b-B) = 4.26
Prob>chi² = 0.9028

**APPENDIX 6.8 Variance Inflation Factor Test (LOGCUR)**

| VARIABLE | VIF | 1/VIF |
|---|---|---|
| POPVOTE | 5.51 | 0.181 |
| DURABLE | 2.96 | 0.338 |
| DISOCC | 2.08 | 0.482 |
| LOGCUR | 1.76 | 0.569 |
| ERA3 | 1.60 | 0.626 |
| DISNAT | 1.55 | 0.644 |
| DISREV | 1.54 | 0.650 |
| FREIGHT | 1.50 | 0.669 |
| VOTECHG | 1.45 | 0.692 |
| ERA2 | 1.40 | 0.714 |
| MEAN VIF | 2.13 | |

**APPENDIX 6.9 Breusch-Pagan Lagrangian Multiplier Test (LOGCUR)**

```
---------+-------------------------------------------------------------
ChgGDPCap [Country,t] = Xb + u[Country] + e[Country,t]

Estimated results:
         |                 Var             Sd = Sqrt(Var)
---------+-------------------------------------------------------------
ChgGDPCap |  0.02799              1.673
e         |  0.01671              1.293
u         |  0.0021               0.458

Test:           Var(u)          =         0
                chi²(1)         =      4.77
                Prob > chi²     =     0.029
---------+-------------------------------------------------------------
```

**APPENDIX 6.10 Random Effects GLS Regression (FLX Years)**

Number of Observations = 119
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.41.61
Wald $chi^2$ = 72.77
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| GGREV | -2.359 | 1.806 | -1.31 | 0.192 | -5.900 | 1.181 |
| EXPORTS | 0.187 | 0.717 | 0.26 | 0.794 | -1.217 | 1.592 |
| EDUC | -1.925 | 1.715 | -1.12 | 0.262 | -5.287 | 1.437 |
| RELPRO | -1.311 | 1.209 | -1.08 | 0.278 | -3.679 | 1.058 |
| POPVOTE | 0.675 | 1.055 | 0.64 | 0.521 | -1.392 | 2.745 |
| VOTECHG | 2.289 | 1.133 | 2.02 | 0.043 | 0.069 | 4.510 |
| FREIGHT | 0.012 | 0.008 | 1.49 | 0.135 | -0.004 | 0.028 |
| ERA 2 | -0.716 | 0.596 | -1.20 | 0.229 | -1.885 | 0.452 |
| ERA 3 | 2.603 | 0.907 | 2.87 | 0.004 | 0.826 | 4.380 |
| ERA 4 | 1.578 | 1.107 | 1.43 | 0.154 | -0.059 | 3.778 |
| DURABLE | 0.002 | 0.006 | 0.34 | 0.737 | -0.011 | 0.149 |
| POLCOMP | 0.135 | 0.124 | 1.09 | 0.275 | -0.107 | 0.378 |
| DISNAT | -0.349 | 0.340 | -1.03 | 0.304 | -1.015 | 0.316 |
| DISOCC | 0.051 | 0.246 | 0.21 | 0.836 | -0.431 | 0.532 |
| DISREV | 0.005 | 0.107 | 0.05 | 0.962 | -0.205 | 0.215 |
| FLX | 0.010 | 0.009 | 1.12 | 0.261 | -0.007 | 0.027 |
| CONSTANT | 1.944 | 1.351 | 1.44 | 0.150 | -0.704 | 4.591 |
| Sigma_u | 0.0000 | | | | | |
| Sigma_e | 0.0143 | | | | | |
| rho | 0.0000 (fraction of variance due to u_i) | | | | | |

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

**APPENDIX 6.11 Random Effects GLS Regression (DEMFLX Years)**

Number of Observations = 119
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.4203
Wald $chi^2$ = 73.96
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| GGREV | -2.229 | 1.805 | -1.23 | 0.217 | -5.768 | 1.310 |
| EXPORTS | 0.064 | 0.710 | -0.09 | 0.928 | -1.456 | 1.327 |
| EDUC | -1.381 | 1.642 | -0.84 | 0.400 | -4.599 | 1.837 |
| RELPRO | -1.675 | 1.130 | -1.48 | 0.138 | -3.890 | 0.538 |
| POPVOTE | 1.024 | 1.022 | 1.00 | 0.316 | -0.979 | 3.026 |
| VOTECHG | 1.826 | 1.182 | 1.54 | 0.123 | -0.492 | 4.143 |
| FREIGHT | 0.014 | 0.008 | 1.64 | 0.101 | -0.003 | 0.030 |
| ERA 2 | -0.882 | 0.566 | -1.56 | 0.119 | -1.991 | 0.227 |
| ERA 3 | 2.655 | 0.885 | 3.00 | 0.003 | 0.920 | 4.389 |
| ERA 4 | 1.769 | 1.126 | 1.57 | 0.116 | -0.437 | 3.975 |
| DURABLE | 0.002 | 0.006 | -0.00 | 0.998 | -0.013 | 0.013 |
| POLCOMP | 0.085 | 0.122 | 0.70 | 0.486 | -0.155 | 0.325 |
| DISNAT | -0.372 | 0.337 | -1.11 | 0.269 | -1.032 | 0.287 |
| DISOCC | -0.008 | 0.241 | -0.04 | 0.971 | -0.482 | 0.464 |
| DISREV | -0.009 | 0.108 | -0.08 | 0.936 | -0.220 | 0.203 |
| DEMFLX | 0.013 | 0.009 | 1.40 | 0.161 | -0.005 | 0.030 |
| CONSTANT | 2.046 | 1.242 | 1.65 | 0.099 | -0.388 | 4.480 |

Sigma_u | 0.0000
Sigma_e | 0.0144
rho | 0.0000 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%

**APPENDIX 6.12 Random Effects GLS Regression (LOGCUR)**

Number of Observations = 119
Group variable: Country
Number of Groups = 15

Adjusted $R^2$ = 0.4123
Wald $chi^2$ = 71.56
Prob > $chi^2$ = 0.0000

| %CHGGDPCAP | Coefficient | Standard Error | t-stat | P-value | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| GGREV | -2.723 | 1.781 | -1.53 | 0.126 | -6.213 | 0.767 |
| EXPORTS | 0.116 | 0.714 | 0.16 | 0.871 | -1.284 | 1.515 |
| EDUC | -1.403 | 1.653 | -0.85 | 0.396 | -4.643 | 1.837 |
| RELPRO | -1.807 | 1.135 | -1.59 | 0.111 | -4.031 | 0.417 |
| POPVOTE | 0.951 | 1.028 | 0.92 | 0.355 | -1.392 | 2.965 |
| VOTECHG | 2.689 | 1.242 | 2.17 | 0.030 | 0.255 | 5.123 |
| FREIGHT | 0.013 | 0.008 | 1.51 | 0.130 | -0.004 | 0.029 |
| ERA 1 | -0.940 | 1.064 | -0.88 | 0.377 | -3.025 | 1.145 |
| ERA 2 | -1.920 | 0.907 | 2.12 | 0.034 | -3.697 | -0.143 |
| ERA 3 | 1.034 | 0.474 | 2.18 | 0.029 | 0.104 | 1.964 |
| DURABLE | 0.007 | 0.006 | 0.12 | 0.902 | -0.012 | 0.013 |
| POLCOMP | 0.122 | 0.123 | 0.99 | 0.322 | -0.119 | 0.364 |
| DISNAT | -0.397 | 0.339 | -1.17 | 0.241 | -1.061 | 0.266 |
| DISOCC | -0.008 | 0.243 | -0.03 | 0.974 | -0.485 | 0.469 |
| DISREV | 0.015 | 0.107 | 0.14 | 0.888 | -0.194 | 0.224 |
| LOGCUR | -0.148 | 0.200 | -0.74 | 0.461 | -0.539 | 0.244 |
| CONSTANT | 3.814 | 1.821 | 2.09 | 0.036 | -0.245 | 7.382 |

Sigma_u | 0.0000
Sigma_e | 0.0143
rho | 0.0000 (fraction of variance due to u_i)

Levels of significance: **** 0.1%, *** 1%, **5%, *10%