

**Perfecting Parliament,
From Autocracy to Democracy without Revolution**

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Part III:

History as Social Science:

Statistics,

Methodological Notes,

and Conclusions

Chapter 19: Quantitative Evidence of Gradual Reform

Anyone who has attempted to keep a diary knows that faithfully recording history is a nearly impossible task, even in very small number settings. There is much that must be left out because of space and time constraints. It is largely for this reason that every history neglects variables and events that might be important.

Both deductive and inductive approaches to understanding history face similar problems in this respect. Just as every historical narrative can potentially be more complete, so can every model. Indeed, many, perhaps most, debates among historians, political scientists, and economists arise from disagreements about whether variable x or event y has been inappropriately neglected or focused on by others. Statistical inference rarely ends such debates, but it does allow hypothesized relationships to be examined systematically and often sheds light on the extent to which particular relationships and variables can account for the events of interest.

With this in mind, chapter 19 provides quantitative evidence and statistical tests to assess further the explanatory power of the model of nineteenth-century European constitutional reform developed in part I. The results broadly support the main hypotheses: (a) that democratic governance arose gradually through a series of parliamentary and electoral reforms and (b) that constitutional and economic liberalization were interdependent phenomena during the nineteenth century.

A. The Temporal Structure of Constitutional and Economic Evolution

The first chapters of the book provided a rationale for both ongoing reforms and for time dependency among institutions and policies. Both institutions and policies are adjusted from time to time as circumstances (or perceived circumstances) change, although they are largely consequences of past political decisions. Risk aversion and information problems produce “rational institutional conservatism.” Institutional conservatism implies that institutional reforms tend to be small, which partly accounts for their stability through time. Neither institutions nor policies, however, are entirely path

dependent, because a series of reforms may lead to convergence of institutions and politics in societies with quite different starting points; that is, past policies and institutions exhibit “inertia,” rather than path dependency, because reformers and policymakers tend to be risk averse and large changes increase a variety of risks associated with imperfect information.

The temporal logic of the analysis can be summarized mathematically with a series of equations:

$$C_t = c(I_{t-1}, W_{t-1}, C_{t-1}, v_t, u_t) \quad (19.1)$$

$$L_t^E = e(T_{t-1}, I_{t-1}, W_{t-1}, C_{t-1}, v_t, u_t) \quad (19.2)$$

$$E_t = e(T_{t-1}, I_{t-1}, W_{t-1}, C_{t-1}, v_t, u_t) \quad (19.3)$$

$$W_t = x(T_{t-1}, E_{t-1}, L_{t-1}^E, W_{t-1}, u_t) \quad (19.4)$$

The nature of a government’s constitution in period t (C_t) reflects preexisting distributions of ideological (I_{t-1}) and economic interests (W_{t-1}), and constitutional architecture determining amendment procedures (C_{t-1}). Changes in the preexisting constitution reflect contemporary political (v_t) and economic (u_t) random shocks that affect the bargaining positions of the parliament and the king, given those preexisting interests and institutions. For the purposes of this chapter, the constitutional characteristics of interest are those that determine *the extent to which* it is a liberal democracy.

The extent of economic liberalization in period t (L_t^E) also reflects past decisions of the government. These reflect the ideological and economic interests represented in the past and the constitutional system in which political decisions were made. Changes in economic policies reflect economic and political shocks that affect current bargaining positions on public policy. For example, changes to the preexisting state of technology (T_{t-1}) affect the politics of economic liberalization, because increases (or decreases) in economies of scale in production and organization tend to require more (less) open

markets to produce profits. Contemporary public education policies (E_t) are affected by the same economic and political considerations. The distribution and level of wealth (W_t) are determined by preexisting education and economic policies, technology, and also contemporary economic shocks (u_t).²⁸⁷

Substituting for education and economic liberalization and rewriting the constitutional and wealth equations as functions of predetermined variables allow one to focus on just two of the four equations:

$$C_t = c(I_{t-1}, W_{t-1}, C_{t-1}, v_t, u_t) \quad (19.5)$$

$$W_t = x(I_{t-1}, W_{t-1}, C_{t-1}, T_{t-1}, v_{t-1}, u_t) \quad (19.6)$$

This aggregate representation of the analysis of part I neglects much of the detail of the previous analysis, but provides a representation that allows nineteenth-century data sets to be used to test the model. When approximated with linear relationships, this representation links economic development (W_t) and constitutional developments (C_t) in a manner similar to that used in empirical work on the political economy of institutions. (See for example, Congleton and Swedenborg [2006] or Paldam and Gundlach [2008]). Note, however, that this structure implies that current constitutional and economic states are interdependent and substantially codetermined by similar past chance events and innovations; that is, time dependency in this model is not an unexplained property of the “error term,” but rather is predicted by the model, especially during the nineteenth century.

B. On the Correlation between Economic and Constitutional Developments

The analysis does not require a deterministic link between economic production and ideology, as posited by Marx and others, but settings exist in which connections between

²⁸⁷ Note that it can be argued that the technological developments (economies of scale) are determined by the same considerations. The prevalence of liberal ideology also varies with individual education and interests and also interest group activities, which are driven by preexisting technologies, past ideologies, and constitutional protections, plus political and economic shocks. Changes in both technology and ideology are examples of economic and political shocks for the purposes of this model. (Natural resources are assumed to be determined by national boundaries, geographic location, and geological factors, which are taken as given in the above analysis.)

them exist. Production technology tends to increase through time (because only improvements are adopted), which implies that a downward trend tends to exist in production costs and an upward trend in personal income, other things being equal. Ideological theories can also exhibit trends insofar as normative theories become more internally consistent, encompassing, and useful through time. In such cases, incidental correlations can exist between technological and ideological refinements. If, however, ideology lacks a clear trend because innovations are common or existing theories are affected by temporary fads or political circumstances, then constitutional reforms tends to resemble a random walk that is uncorrelated with economic developments, unless the nature of economic regulation is affected by the same ideological shifts.

In such cases, the models imply that ideology and techniques for organization affect constitutional developments, but fluctuations in procedures for making public policies would be essentially uncorrelated with economic development, which seems to have been the case for many nations in Europe in periods before 1800. For example, the balance of power between the English king and parliament in 1630 consisted of a dominant king. English policymaking was dominated by parliament in 1650 and characterized by an intermediate form of the bipolar template in 1670; both king and parliament retained policymaking power. The Glorious Revolution of 1688 shifted additional power to the parliament, but retained the bipolar template (Morgan, 1997: 310, 326, 334, North and Wiengast, 1989: 817). Sweden began the eighteenth century with policymaking power concentrated largely in the king, followed by a period with a dominant parliament, the so called “age of freedom” in 1719–72. It ended the eighteenth century with a king-dominated government and the restoration of royal prerogatives after 1789 by

Gustav III (Wiebull, 1993: 53, 61, 74). These shifts of authority took place for the most part without radical changes in economic conditions.

In general, a correlation between economic development and political liberalization will not exist unless constitutional and economic reforms are driven by similar innovations and circumstances. In cases in which ideological and technological innovations are affected by the same innovations, as might be said of the period in which liberal economic and political movements emerged, the models developed above suggest that economic and political developments will be highly correlated. In such cases, economic and political shocks will produce policy reforms that move in similar directions.

As noted above, theories of economic and political liberalization were connected in the nineteenth century (and largely remain so today). The arguments favoring political liberalization were similar to those favoring economic liberalization, as were the interest groups that were likely to benefit from economic and political reforms.²⁸⁸ In some cases, both technological and ideological innovations bias bargaining situations in favor of one of the other branches of divided governments.

C. Nineteenth Century Trends in Constitutional and Economic Reforms

For the past two centuries, there has been a worldwide trend toward parliament-dominated forms of the king and council template. One explanation for this trend is that a series of changes in the circumstances confronting kings (and queens) lead them to bargain gradually away most of their control of public policy in exchange for favorable policy decisions on matters of relatively greater importance to the king, including foreign policy and the enhancement of royal lifestyles. Three sorts of shocks favored economic and political liberalization.

²⁸⁸ The gradual penetration of ideas from the enlightenment—the recognition that reason and observation are important engines of progress—helped propel both technological and ideological innovation. These ideas were not an invention of the late eighteenth or early nineteenth century. Consider, for example, this pre-enlightenment passage taken from a piece written by the Dutchman Jacob Hendrix in 1582. “A free mind, in which an unrestricted intellect governs, can see and observe ... what is honest, profitable, righteous, lawful, proper, possible, feasible, and necessary...the mind inflamed by the fire of passion cannot judge rightly in private nor in common matters” (Van Gelderen 1993: 169). Such ideas, however, tend to have little effect on public policy, unless they are accepted by a sufficient number of policymakers (or indirectly influence them). Such ideas became more broadly accepted in the late eighteenth and early nineteenth centuries, as clearly indicated by the arguments of organized politically active groups during the nineteenth century.

Technological Shocks. Changes in technology produced new economies of scale in production and reduced the cost of communication. Such changes alter the balance of both economic and political interests. Many of the same innovations in organization, transport, and communication that allowed hundreds and thousands of persons to be organized into productive industrial concerns were also used to organize other large-scale organizations: political parties, unions, cooperatives, and other large politically active interest groups. Industrialization tends to take place in towns and cities, and the greater population densities of cities allow industrialists, tradesmen, and laborers to organize more easily to resist the policies of a king and unrepresentative councils. Moreover, with the advent of the Industrial Revolution, the policy consequences of taxation, regulation, and torts became relatively more difficult to assess, but relatively more important to the economic development of the polity, which increases the informational advantages of representative councils.²⁸⁹

Insofar as shifts of power between king and council tend to favor those whose ability to exert effective political pressure through resistance and advocacy, industrialization may favor democratization—an increase in the range of policies decided by (a more broadly elected) parliament. Firm owners tended to favor fewer laws regulating access to internal and external markets. Other preexisting political interest groups were able to more effectively organize persuasive campaigns, in some cases with the help of free trade groups. New patterns of trade changed the distribution of wealth among elites and also affected the royal household's interest in raising funds via taxation. Changes in the complexity of policy analysis increased the informational of more representative councils. The cost of alternative forms of monitoring and increased literacy tended to increase the importance of broad public support for public policies.

Ideological shocks. Changes in the positive and normative theories of governance may also affect the cost of control and resistance by changing the norms against which current

institutions and policies are judged. Ideological shifts of the past two centuries also caused previously unorganized groups or individuals to recognize new common interests, which created new advantages for organized activities, while technological advances reduced organizational costs. The liberal, union, and socialist organizations that emerged in the industrialized societies of the nineteenth and twentieth centuries clearly helped to motivate a wide range of public policy debates and evidently affected the opinions of those in government as well. Shifts in suffrage norms, as we have seen, can motivate suffrage reforms, and the same ideas also tend to favor the parliament over the king.

Changes in ideology tended to shift the basis of legitimacy for king-dominated governments from divine intention to popular sovereignty. When the highest royal office is considered to reflect an implicit social contract, as argued by many scholars of the eighteenth century, it becomes a quite different office than when it is believed to be the result of divine providence. Contracts have reciprocal duties and when violated by one or the other party, the contract ends. Although such ideas existed well before the nineteenth century, it was during the late nineteenth centuries that the norms of popular sovereignty and popular suffrage broadly replaced those based on the divine right of kings. Such ideological (philosophical changes) tended to favor the elected branches of parliament both by increasing the moral authority of elected chambers and by reducing the effectiveness of royal efforts to maintain control by producing what Wintrobe (1998) terms “loyalty.”

Genetic shocks. Another systematic source of drift toward parliamentary domination of policy formation is variation in the talent and planning horizon of kings through time. As competition for membership in the royal council or parliament becomes more open through time, the talent of the council tends to be high and fairly consistent through time. On the other hand, the vagaries of training, tastes, and breeding imply that the talent and interests of a king or queen tend to vary considerably through time. (Substantial evidence

²⁸⁹ Evidence of the importance of technological developments for political organization is developed in Dudley (1991, 2000) who provides a historical and economic analysis of how informational technologies can affect the size and scope of national governments. Although his analysis emphasizes institutional revolutions, rather than the evolution of governance, his analysis of the importance of technology is compatible with the analysis developed above.

exists of reversion toward the mean in the children of talented persons.) A series of kings may, because of their own immediate interest in activities other than governance, simply allow a relatively more talented council to make more and more policy decisions directly. A weak or disinterested king may also be out-bargained by a very talented council. To the degree that an occasional farsighted or very forceful king is unable to recapture fully the authority given up by weaker rulers—because of deference to traditions or precedents that help legitimize state authority—genetic shocks generate a systematic drift toward council control—other things being equal. (A parliament’s bargaining power is also increased by the unexpected death of a king, as has happened many times in European history.)

Although technological and ideological shifts do not necessarily favor economic and political liberalization, the historical narratives developed in part II suggest that many of the factors given prominence in the models of institutional reform developed in part I were present in the West during the nineteenth century. New production technologies with economies of scale were gradually adopted, liberal political and economic ideas gradually became more influential, and more interest groups lobbied for various liberal reforms, including constitutional ones. New forms of economic and political life emerged gradually and became significant factors in societies that emerged by World War I.

Numerous common markers existed along the way. Parliaments gradually gained authority over domestic policy, followed by foreign policy. Transport networks using old and new technologies (canals and railroads) became more extensive, better integrated, and more efficient. Public education became more universal and mandatory. Internal and external trade barriers were reduced or eliminated. Suffrage expanded gradually as wealth restrictions were reduced, the secret ballot was introduced, and weighted (plural) voting eliminated. Urbanization and “hiring oneself out for wages” became increasingly commonplace. Household production shifted to factories, while that which remained

became more capital intensive and efficient, as with washing and sewing machines. Liberalization of markets and politics clearly appears to have been interdependent phenomena. Parliamentary control over executive appointments to the cabinets and royal councils became increasingly complete.

Political and economic reforms both tended to be gradual and appear to have been codetermined as predicted by the models of part I. Relatively small reforms were commonplace as new gains to trade and organization emerged through time. Liberalization itself did not begin in the nineteenth century, but it was in the nineteenth century that a clear trend emerged in Europe.

D. Some Quantitative Approximations and Descriptive Statistics

Quantitative evidence of economic and political reforms during the nineteenth century is broadly consistent with the qualitative evidence developed in the historical narratives, although the evidence tends to be somewhat coarse and is less complete and reliable than contemporary data sets.²⁹⁰ To construct measures of gross domestic product and political authority from relatively incomplete historical records is clearly a difficult task.

Economic historians have constructed estimates of both macro- and microeconomic data sets based on historical records. As true of current data, these estimated gross domestic product (GDP) and price indices are most carefully done for countries with relatively good records of trade and taxation. Most do not penetrate very deeply into the nineteenth century. And it bears noting that per capita GDP data provides only very rough estimates of personal income in the nineteenth century, both because of data problems and because of the great changes underway. GDP estimates are based on market activity and therefore do not include the portion of household production not taken to market,

²⁹⁰ Many of the statistical techniques and models that made quantitative data of interest were not developed until the twentieth century. For example, the gross national product concept was developed by economists in the 1930s, and GNP data were not routinely assembled until after World War II (Carson 1975). Contemporary GDP data sets are assembled at substantial cost by standing teams of government economists and accountants, although even this important aggregate economic measure remains error prone in contemporary periods, particularly unsettled ones. For example, initial values are often substantially revised as information and theory change. Runkle (1998) notes, for example, that U.S. RGNP was initially estimated to have fallen by 5.8% in 1974–75, but now is judged to have fallen by “only” about 2 percent.

which was a much larger fraction of household income in the first part of the nineteenth century than at the century's end. Consequently, using GDP per capita to measure average personal income tends to be biased downward for the early part of the century because so much "income" was directly produced at home. Growth rates are biased upward for similar reasons.

Political indicators are also problematic, because existing practices are only partly written down in formal documents. With the exception of vote counts and seats in parliament, political evidence is naturally less numerical than economic data. One can say with some confidence that suffrage is twice as large in country A than in country B, but cannot so easily conclude that parliament in country A is twice as powerful or its government twice as democratic as that of country B.

Election data tend to be sparse in the early part of the nineteenth century, in part because voting was often by voice, rather than by ballot, and in part because elections for seats in parliament were often not contested. Data on party affiliation are also scarce because disciplined political parties emerged, for the most part, only in the late nineteenth century, although factions have long existed. Moreover, there are no simple measurements of ideology, parliamentary authority, or democracy, per se.

There are, however, a variety of political markers, and so attempts have been made to construct indices of democracy. These are not likely to be any more accurate than estimated GDP, because so much of the political accounting is necessarily based on subjective appraisals of informal political procedures by political scientists and historians. Such appraisals, however, as of wine, are not entirely in the eye of the beholder, and they do, along with the GDP estimates, provide additional evidence of the systematic changes underway in the polities of interest for the present study.

Quantitative Indices of the Relative Authority of King and Council

The Polity IV data base extends back to 1800 for many countries and is based on expert appraisals of a number of common characteristics for the countries of interest. These are used to create numerical "subindices," which are then aggregated into indices of democracy. Polity's 0–10 index of democracy is the most relevant for the purposes of this book. It is composed from several subindices that focus on constitutional procedures and de facto political procedures, as judged by the country experts. Unfortunately, the index of democracy focuses on procedures through which a country's "chief executive" comes to office, rather than the distribution of policymaking authority between the executive and parliament or between the central and regional governments.

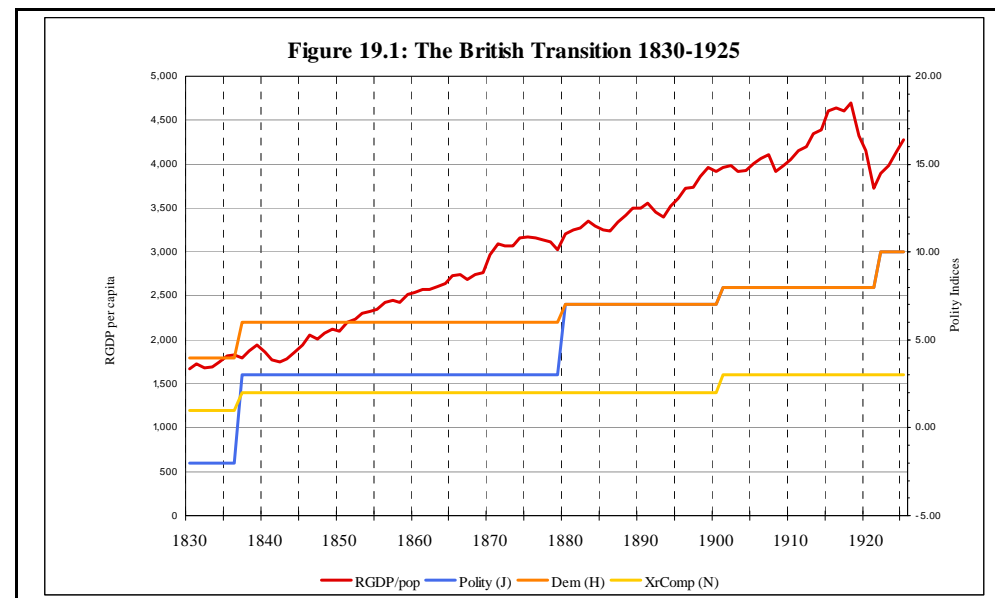
In nineteenth-century parliamentary systems, determining whether the executive is elected or not requires one to determine whether the prime minister or king is actually the chief executive in a given year. As noted above, the balance of authority is rarely codified in constitutional documents and therefore the polity indices require assessing the relative importance of policies controlled by the king and cabinet and the extent to which the king controls the cabinet or it is determined by parliament. Because of this, the polity indices shed light on only one of the shifts in authority required for the emergence of parliamentary democracy, although a very important one. The polity indices also shed some light on the extent to which "chief executives" are politically and constitutionally constrained.²⁹¹

Figures 19.1, 19.2, and 19.3 plot economic and political indicators for the United Kingdom, Sweden, and the Netherlands. The figures below plot per capita gross domestic product in constant dollar terms (RGDPpp) and three indices of democratic procedures for the United Kingdom, the Netherlands, and Sweden. The RGDPpp data are from

²⁹¹ The democracy index is an 11 category index that attempts to represent three characteristics: (1) the existence of institutions through which citizens "express effective preferences about alternative policies and leaders," (2) the extent to which there are "institutionalized constraints on the exercise of power by the executive," and (3) aspects of civil liberties and the rule of law. The index, however, focuses on a weighted average of indices of "the competitiveness of political participation, the openness of executive recruitment, and constraints on the chief executive" (Marshall and Jaggers 2005: 17–18).

Offisor (2006) for the United Kingdom, from the Van Zanden's and others' (2000) study for the Netherlands and from Edvinsson (2005) for Sweden. Included in the figures is the subindex of executive competition variable, which takes values from 1–3, and two more widely used indices: the polity democracy index takes value from 1–10, and the polity index, which takes values from –10 to +10. Because there are different experts for different countries, cross-country comparisons are less than completely reliable. The intracountry numbers are, however, internally consistent.²⁹²

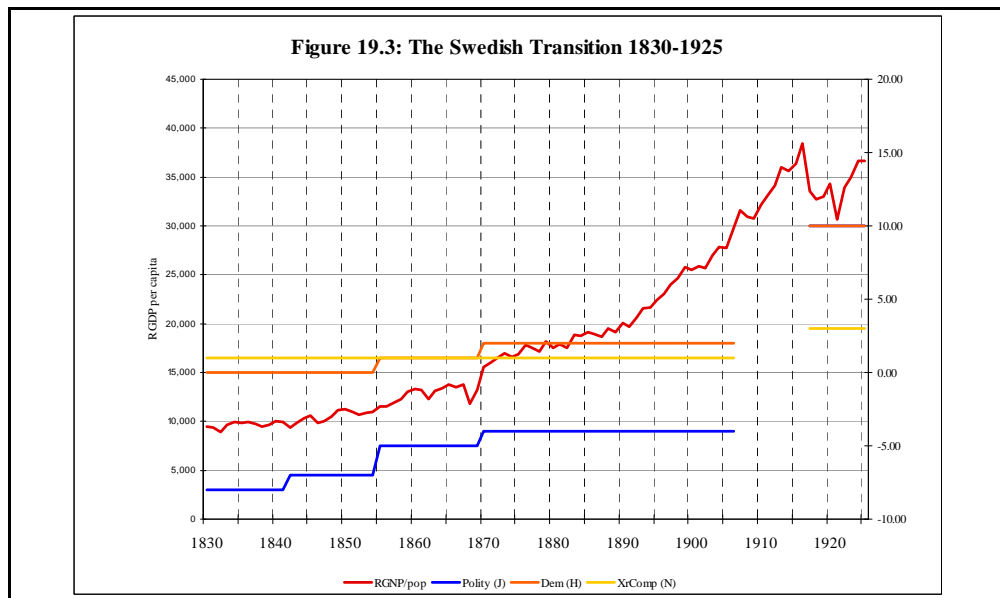
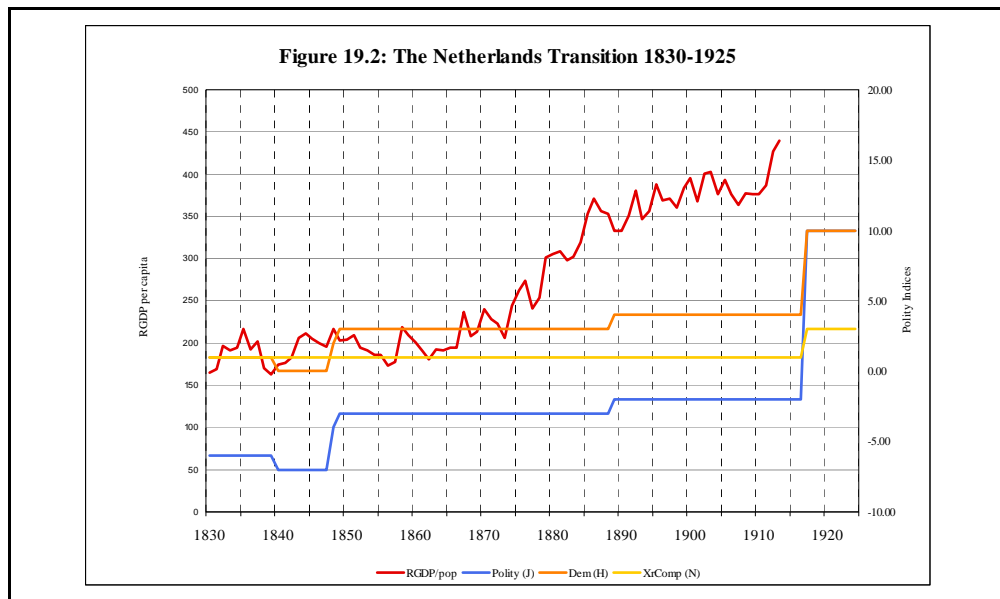
The graphs indicate that increases in average income were more or less continuous during the nineteenth century, although economic growth tends to be exaggerated by most historical data series. Such constructed indices are also smoothed somewhat by researchers to reduce other kinds of measurement errors.²⁹³ The political indices also show a gradual increase in the democratic basis of executive political authority, as kings became less important and the prime minister more so during the century. This is directly indicated by the executive competition index. It bears noting, however, that the political indices have also been smoothed somewhat and that the discrete numerical values tend to make very gradual transitions appear to be step functions.²⁹⁴ Both real per capita GDP and the political indices of democracy rose gradually throughout the period, although the timing of economic growth and institutional reforms differ somewhat.



²⁹² Most studies of this period rely on the Maddison (2003) compilation of data. I use the country level studies of Van Zanden, Offisor, and Edvinsson, which were created after the Maddison studies and make use of more recently available information. The Maddison estimates of RGDP per capita are broadly similar to the updated values of the country studies.

²⁹³ Business cycles were commonplace during this period, many of which were international in scope (Jacobs and Smits 2001). Van den Berg and others (2006) note that business cycles in the nineteenth century can have significant effects on quality of life and mortality.

²⁹⁴ Polity suggests that XRComp characterizes the competitiveness of executive recruitment, because it includes consideration of the selection process (hereditary, designated, or elected); however, it seems to be a measure of the extent to which power is shared between the king and parliament during the period of interest here. Essentially, a value of 1 implies royal dominance, 2 sharing between a king and an elected prime minister, and 3 dominance by an elected prime minister (Marshall and Jagers 2005: 24). Our analysis and discussion, however, suggest that these three categories can only roughly measure what is actually a continuum of the division of power.



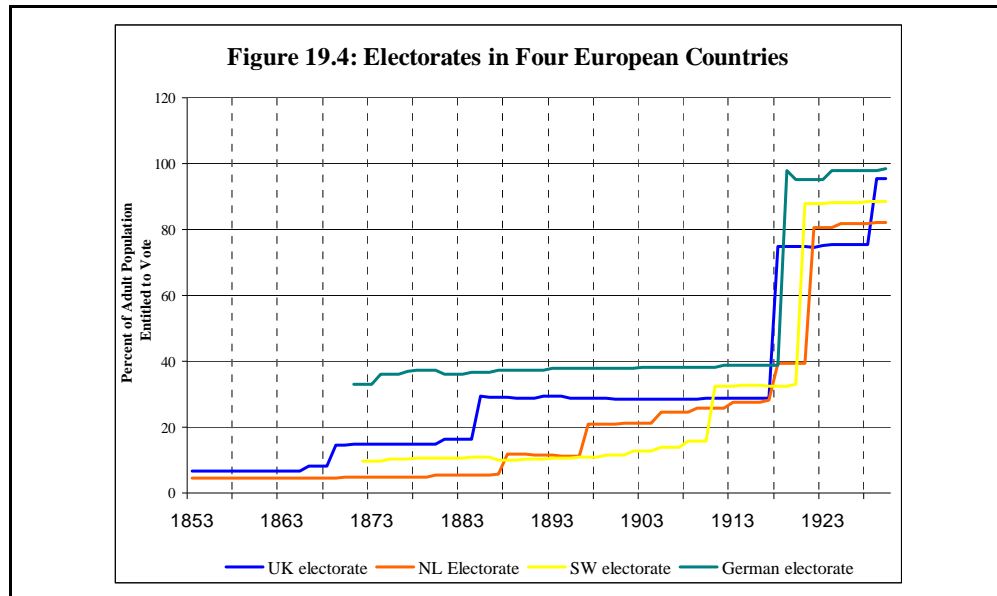
The polity indices for Sweden rise more slowly than is fully consistent with the rise of parliament and expansion of Swedish suffrage in the late nineteenth century, because authority over the cabinet was resolved fairly late in this process. As noted in the chapter on Sweden, significant reforms of its parliament were adopted in that period. It is also clear that elections continued to be held as constitutional reforms were introduced, debated, and adopted. For example, the 1907 election law reforms established universal (unweighted) suffrage and proportional representation for the selection of parliament. Negotiation over control of the executive, however, remained informal and were adjusted in favor of parliament during this period. This result is reflected in the increases in competition for the executive competitive index (XrComp), which from 1916 on focuses on the prime minister rather than the king. It is also reflected in the democracy index, which includes XrComp as a major component. Some of the reforms adopted in this period had delayed effects, for example, turnover in the upper chamber took place during nine years, although the effects of parliamentary reforms are only indirectly reflected in the polity indices (Congleton 2003, ch. 3, Verney 1957, ch. 8–9).²⁹⁵

Quantitative Indicators of Electoral Reform

A more direct quantitative indicator of the use of democratic procedures for selecting members of parliament, as opposed to the chief executive, is participation in national elections for seats in parliament. Records exist for suffrage law and for the number of votes cast in late nineteenth-century elections. These can be used to estimate eligibility to vote and voter turnout. Eligibility to vote within Europe has been calculated by Flora and others (1983) for most of the countries and period of interest for this volume. Time series of eligibility for four European countries are graphed below in figure 19.4. These clearly indicate a gradual expansion of suffrage—more or less as step function for the countries depicted. (Interpolated values of the Flora calculations were provided by Aidt.) Suffrage reform was not an all-or-nothing revolutionary event, rather significant reforms were

²⁹⁵ Some of the coding for the Swedish case is coded as “88” from 1907–16, which indicates a period of “transition” (Marshall and Jaggers 2005: 18) in which the usual indices are not or cannot be calculated. I suppose that this reflected greater ambiguity than usual over who could appoint the cabinet in this period.

adopted occasionally throughout the nineteenth century. Several large revisions are evident for each of the four countries included.



Voter turnout in the early nineteenth century is more difficult to assess than eligibility to vote, because many elections were by voice vote, and many elections were unopposed before the emergence of well-organized national political parties. Both factors tended to make turnout less important for both candidates and voters in the early nineteenth century—as did the relative unimportance of parliamentary representation. Vote tabulations, however, are available for the second half of the nineteenth century, as more elections for seats in parliament were contested and as paper ballots and secret ballots were introduced. Table 19.1 lists votes cast, population and fraction of the population voting using data from Paxton and Cook (1998) for the number of voters and population. The Paxton and Cook data for the Netherlands and Sweden are supplemented by data taken directly from Dutch and Swedish election records.

Population from national census data does not align perfectly with election dates, and these have been interpolated from the nearest available data points. Participation rates are rough approximations, based on the assumption that adults make up half of the population and that the adult population is half men and half women. Note that electoral

participation gradually expands both numerically and proportionately throughout the century, as more and more persons qualified for the wealth restrictions in existing suffrage law and as the suffrage laws were themselves gradually liberalized in the second half of the nineteenth century.

Table 19.1
Votes Cast in National Elections and Population

in nineteenth Century Netherlands, Sweden, and the United Kingdom
(in thousands, from Cook and Paxton, *European Political Facts 1848-1918*)

Election Years (NL and UK)	Netherlands			Sweden			United Kingdom		
	Voters	pop (interpolated)	2*voters/pop	Voters (nearest yr)	pop (interpolated)	2*voters/pop	Voters nearest >1886	pop (interpolated)	2*voter s/pop
1831							435.4	26081.571	0.033
1833							652.8	26211.457	0.05
1866							1056.7	30206.1	0.07
1869							1995.1	30973.32	0.129
1883							2618.5	35454.42	0.148
1886							4380.5	36308.85	0.241
1888	292.6	4471.267	0.131	274.7	4719.196	0.116			
1891	293.8	4629.92	0.127	288.1	4784.98	0.12		37732.9	
1894	299.1	4807.7	0.124	339.9	5101.258	0.133			
1897	576.6	4985.48	0.231						
1901	609.6	5254.84	0.232				6730.9	41458.7	0.325
1905	752.7	5556.52	0.271						
1909	843.5	5858.2	0.288	503.1	5445.2	0.185	7710	44976.44	0.343
1913	960.6	6243.4	0.308	1066.2	5558.837	0.384			
1918	1081.5	6690.1	0.323	1124	5777.462	0.389	21392.3	43833.754	0.976
1922	1844.8	7079.36	0.521				21127.6	42957.442	0.984

Together, figure 19.4 and table 19.1 support the hypotheses that the pattern of voting changed fundamentally between 1850 and 1925 and that reforms did not take place in one revolutionary step, but through a series of reforms. The lower chambers of parliament were elected by universal male (and subsequently adult) suffrage elected via secret ballot in the period just before World War I. In combination with the polity data for executive

office, the data also indicate that substantially new procedures for selecting public policy gradually emerged in the nineteenth century, because parliaments had gradually obtained more or less complete control of public policy through their control of appointments to the executive cabinet. Broadly elected parliaments increasingly came to have broad authority over public policy. This is indicated above for the constitutional monarchies of Great Britain, Sweden, and the Netherlands. Similar tables and diagrams could be constructed for Belgium, Denmark, Italy, and Japan, and also for the republics of the United States, Switzerland, and France. Although each of these countries has a somewhat different path of electoral and parliamentary reform, the beginning and end points are remarkably similar.

Cumulative changes were “revolutionary,” but were not the result of a single great reform. In the constitutional monarchies, the medieval template of king and parliament remained in place at the end of the period of interest. There was still a king and a council in 1830 and 1930, although the balance of authority and nature of parliament had changed dramatically over the century. In very few cases did significant discontinuities occur before World War I, and in those cases, an elected president tended to replace a king, and the president governed with an independently elected parliament, much as kings had in the mid-to-late nineteenth century, preserving the essential architecture of the king and council template.

E. Statistically Significant Correlations

The same data sets allow statistical methods to be used to test some of the hypotheses derived from the analytical history developed in part I. The main hypothesis is simply that economic and political institutions are interdependent. The organizational problems addressed are fundamentally similar, and technological and ideological innovations can trigger similar reforms. Moreover, in the nineteenth century, the ideological case for economic liberalization was often similar to that for political

liberalization and often required political reform to be accomplished. Statistically, this implies that one should find significant correlation between per capita RGDP and the democracy index during periods of economic and political liberalization. Such correlation is evident in the figures above, to the extent that both RGDP per capita and the various Polity indices of democracy generally increase throughout the century.

To see whether or not these visual regularities are statistically significant, simple time series regressions were run on real per capita GNP and the Polity democracy index for the period from 1830 to 1929 for the same three countries: the United Kingdom, the Netherlands, and Sweden.²⁹⁶ Linear estimates of equations 19.5 and 19.6 are reported in table 19.2. The implied correlations between economic and political developments are present at statistically significant levels. These are consistent with the theoretical and historical analysis undertaken above, notwithstanding the various measurement problems; however, by implicitly assuming that ideological and technological innovations have mean zero during the period, the coefficient estimates are biased. Trends in average technology and ideology not immediately reflected in political liberalization or average income show up as a time dependency of the error term, which as predicted, is present in each of the estimates.

These results suggest that the theory developed in part one of the book and the historical narratives of the individual countries are not refuted by the data and, moreover that the interdependence is substantial and statistically significant. The R-squares suggest that more than half of the variation in the two variables is jointly determined. Similar correlations between income and political developments are often found in studies of late twentieth-century governance in broad cross-sectional studies. See, for example, Lipset (1959), Grier and Tullock (1989), Knack and Keefer (1995), Przeworski (2000), Bueno de Mosquita and others (2003), Paldam and Gundlach (2008).

²⁹⁶ Pooling data is always problematic, because making economic data comparable across countries requires plausible cost of living adjustments, which are often quite difficult to make, and also measures for minor and major differences in political institutions that significantly affect policy formation (Congleton and Swedenborg 2006). Only crude approximations of these effects can be made by simply including country binary and year variables. For this reason, single country time series estimates are summarized below in table 19.2.

Table 19.2
Simple Regressions of
Real Per Capita Domestic Product and Polity's Democracy Index

United Kingdom, Netherlands, and Sweden
 1830–1929

	UK RGDP per capita (ls)	UK RGDP per capita (arch)	NL RGDP per capita	SE RGDP per capita
Constant	-588.435 (-2.47)**	-1017.974 (-8.32)***	140.654 (8.86)***	12584.35 (23.97)***
Democracy Index	545.860 (34.16)***	630.203 (38.78)***	46.751 (8.94)***	2515.341 (19.31)***
R-square	0.72	0.68	0.49	0.81
F-statistic	255.33***	39.83***	79.93***	373.21***
DW	0.16	170	0.15	0.06
N Observations	100	100	84	90

	UK Democracy (LS)	UK Democracy (Arch)	NL Democracy (LS)	SE Democracy (LS)
Constant	2.667 (9.89)***	3.863 (13.72)***	-0.0864 (-.25)	-3.584 (-10.37)***
Real GDP per capita	0.001 (15.97)***	0.001 (15.25)***	0.011 (8.94)***	0.000322 (19.32)***
R-square	0.72	0.94	0.49	0.81
F-statistic	255.33***	252.98***	79.93***	373.21***
DW	0.19	1.42	0.15	0.05
N Observations	100	99	86	90

* Denotes significance at the 10 percent level. ** Denotes significance at the 5 percent level. *** Denotes significance at the 1 percent level.

To the degree that past investment and policy decisions constrain current ones, the theory predicts that error terms should be time dependent, and so the presence of statistically significant autocorrelation supports the theory.²⁹⁷ The regressions all exhibit

²⁹⁷ It bears noting that ideological and technological shocks are not in themselves entirely exogenous either. For example, one could represent them as coterminous variables as with $T_t = s(T_{t-1}, E_{t-1}, L_t^E, W_{t-1}, u_t)$ and $I_t = i(I_{t-1}, E_{t-1}, C_{t-1}, W_{t-1}, v_t, z_t, u_t)$. After substituting for these relationships, the correlations between W_t and C_t implied by 19.5 and 19.6 are stronger and can be interpreted as consequences of past common stochastic shocks (innovations and ideological fads).

For many purposes, however, these two stochastic variables can be treated as exogenous factors, insofar as the random components of these two variables are very large. If genius and/or luck are required for innovation, the stochastic factors u_t and z_t are the primary drivers of T and I . In that case, ultimately “genius” and “luck” drive both economic and constitutional development in the long run, which provides a role for exceptional men and women in the model. In the medium run, however, institutions can be taken as given and it will be the procedures and interests currently represented in existing governments and senior management that determine the future path of policy reform and technological refinement.

the autocorrelation. Similar results can be found for other countries of interest for the purposes of this study, including the Belgium, Germany, and the United States, although the polity indices less faithfully reflect parliamentary reforms in those other countries.

F. Joint Causality Tests

It is well known that correlations do not imply causality, and in the present case, it simply affirms the hypothesized interdependence. Neither RGDP nor the democratization of political institutions are entirely independent variables according to the models developed in part I. Somewhat more direct tests of this hypothesis are possible using the statistical causality tests developed by Granger (1969). The Granger approach uses past values (lags) of two variables thought to be interdependent as estimators. If past values of variable X contribute to the explanation of variable Y , then X is said to “Granger cause” Y in the sense that past values of X help predict current values of Y . Joint causality is said to exist if past values of Y also help to predict present values of X .

Granger causality tests are possible for five of the six case study countries. Table 19.3 summarizes the results. The Granger causality tests suggest somewhat stronger causality from economic to political developments, although joint causality for economic and political developments in the United Kingdom, the United States, and the Netherlands cannot be rejected at plausible levels of statistical significance. Swedish causality is stronger from economics to political reform. Germany causality is stronger from political developments to economic ones. The results for the United States are the most surprising, because so most of its economic and political liberalization took place before 1830.

Table 19.3
Granger Causality Tests for Economic and Political Change
 United Kingdom, the Netherlands, Sweden, Germany, and the United States
 Nineteenth Century to Early Twentieth Century

UK Rgdp per capita does not Granger Cause UK democracy	7.96***
UK democracy does not cause Rgdp per capita	2.12*
NL Rgdp per capita does not Granger Cause NL democracy	242.62***
NL democracy does not cause NL Rgdp per capita	25.77***
SE Rgdp per capita does not Granger Cause SE democracy (logs)	3.48**
SE democracy does not cause SE Rgdp per capita (logs)	0.49
DE Rgdp per capita does not Granger Cause DE democracy	1.59
DE democracy does not cause DE Rgdp per capita	3.81**
US Rgdp per capita does not Granger Cause US democracy	7.00**
US democracy does not cause US Rgdp per capita	26.87***

(The period of interest is 1830–1929, although the data sets were somewhat incomplete for the Netherlands and Germany. Periods of unruly transition in Germany and Sweden are coded as not available.)

* denotes significance at the 10 percent level.
 ** denotes significance at the 5 percent level.
 *** denotes significance at the 1 percent level.

G. Conclusions

One method for addressing the limits of every research methodology is to use more than one approach to develop and appraise hypotheses. Part II demonstrated that there is substantial historical support for the models developed in part I. Chapter 19 shows that the qualitative and anecdotal evidence provided by historians and historical documents is further supported by quantitative evidence. Economic and political liberalization were closely connected throughout the West during the nineteenth century, as one “boot strapped” the other. Chapter 19 provides statistical evidence that causality is bidirectional. Economic policies reflect politics, and politics reflect political institutions, which are themselves slowly adjusted through time. Overall trends may reflect technological and

ideological trends as posited in part I and discussed in part II, but statistical evidence requires indices of political and technological developments. The theory suggests that changes in technology and political and economic theory induce changes in the efforts of interest groups and voters to support economic and political liberalization. Unfortunately, no data sets exist of the penetration of liberal ideas into the electorate, elected officials, or the relative influence of interest groups motivated by such arguments. Data sets on technological advance are also unavailable. Given the somewhat coarse polity indices and the fact that the democracy codings of individual countries focus on the executive, rather than parliament, the statistical results are stronger than might have been expected. Nonetheless, the estimates are broadly consistent with the joint-causality explanation of the emergence of democracy and markets in the nineteenth century.

It is by no means necessarily the case that the correlations predicted would be evident in the data. Institutional reforms are not literally driven by year-to-year changes in per capita real gross domestic product, nor are year-to-year variations in average income driven by recent institutional changes alone. Rather, institutions are occasionally revised as those with the authority to do so believe it to be in their political interests to do so. Subsequent changes in economic policies allow better (or worse) realization of economies of scale. Changes in per capita RGDP, of course, reflect past technological innovations as well as past economic policy decisions. The model estimates account for between half and 80 percent of the codetermination between economic and political developments in the West, which suggests that the choice setting modeled in part I were commonplace and important in Europe during the nineteenth century.²⁹⁸

In addition to these aggregate studies, some case-specific quantitative evidence also exists that both economic and ideological interests have influenced particular debates within parliaments. For example, Schonhardt-Bailey (2003, 2006) provides statistical evidence that such ideas influenced debate over repeal of the Corn Laws (agricultural tariffs) in the United Kingdom. Aidt and Franc (xxxx) provide similar evidence for the

²⁹⁸ It bears noting, however, that the variance of the true error term is likely to be somewhat larger than the results suggest, because both the RGDP and polity data series have been smoothed by the social scientists who assembled them to reduce measurement errors, which tend to increase intertemporal correlation within and across data series.

British election reform of 1832. Overall, the results developed in this chapter and elsewhere by other researchers are consistent with the analysis of part I.

The same results also suggest that unique factors also play a role in a nation's political and economic development. "Unsystematic factors" are evident in the unexplained variation in economic and political development in all of the estimates reported above. Every person has unique talents and interests, and every setting includes unique opportunities and constraints. The above analysis suggests, however, that focusing on important men and women or on national "exceptionalism" tends to miss much that is not unique about the emergence of modern democratic and economic societies in the West.