Soft Power, World System Dynamics, and Democratization:

A Bass Model of Democracy Diffusion 1800–2000

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In memory of Walter Goldberg

Short title: A Bass Model of Democracy Diffusion 1800–2000

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Abstract

Political scientists seldom translate system terminology into systems analysis. This article uses Polity IV data to probe system dynamics for studies of the global diffusion of democracy from 1800 to 2000. By analogy with the Bass model of diffusion of innovations (1969), as translated into system dynamics by Sterman (2000), the dynamic explanation proposed focuses on transitions to democracy, soft power, and communication rates on a global level. The analysis suggests that the transition from democratic experiences ("the soft power of democracy") can be estimated from the systems dynamics simulation of an extended Bass model. Soft power, fueled by the growth in communications worldwide, is today the major force behind the diffusion of democracy. Our findings indicate the applicability of system dynamics simulation tools for the analysis of political change over time in the world system of polities.

Keywords: democracy, system, communication, simulation, power, diffusion

> The internet is showing people what life can be like. And when people
> who live in repressive countries see that, it makes them want it.
>
> —Salman Rushdie

INTRODUCTION[*]

System Thinking in Political Science

It is a paradox that system thinking is unorthodox in political science. Although David Easton's *A Framework for Political Analysis* ([1965] 1979) endeavored to integrate systems theory into the analysis of political processes, his attempt was both extremely successful and, at the same time, flawed. It was successful in that the terminology and concepts of systems analysis have come to permeate most political analysis as we know it today. "Political systems" at the conceptual level is one of the most common notions in modern political science, and "outputs" (such as decisions) and "inputs" (such as support) of a political system are well-established concepts.

Systems terminology is, thus, a generally accepted element of the culture of political science. Nevertheless the notion of political systems analysis is imperfect, since most applications only pay lip service to the basic concepts and terminology of systems theory, which is a branch of science in its own right. For example, the dynamic behavior of a system in consequence of feedback and delays between support and decisions can neither be described nor analyzed using

the traditional methodologies of political science. Apart from exceptions like Karl Deutsch's *The Nerves of Government* (1963), what we generally see in political science is a *static* use of systems approaches: systems concepts are primarily appropriated as heuristic tools or structures for narrative accounts of what is empirically found in terms of inputs, outputs, feedbacks, "throughputs", and the like. Moreover, exceptions to the rule are normally not found in the main body of political science literature. *Micromotives and Macrobehavior* (1978) by the 2005 Nobel laureate Thomas Schelling is a rare exception—if it is acknowledged as belonging to political science at all.

At least three reasons may be given to explain why political science lacks dynamic systems thinking. One, as Easton writes in the preface to the second edition of *A Framework for Political Analysis* (1979), was the hope that in the long run the behavioral approach and the schools it has given birth to since the 1950s will finally contribute to a basic understanding of how political systems operate. We now see that this was an empty hope. In the last decade, for example, the turn to comparative studies of trust, confidence, and reciprocities in political systems as critical elements for working democracies shows that even the most fundamental dynamics of societal systems have not yet been fully understood. According to Schelling, the contingent micro-level logic of behavior—hard to discern using the traditional approaches of political science—may have drastic and unforeseen consequences at the aggregate or systemic level.

A second reason for the decline in systems-oriented studies seems to be that systems analyses are often reduced to what "behaviorists" have paradigmatically considered illegitimate functional explanations in comparisons of societies.[1] This appears to be the case despite Easton's assertion that his systems approach has very little to do with the concept "system" in sociology or economics and is instead allied with systems sciences or what is "at times more narrowly characterized as communication sciences" (1979: xv).

The third critical reason that systems analysis is still-born in political science is the lack of a methodological technique for analyzing how the "flow of Effects from the Environment", as Easton has called it in his famous diagram (1979: 110), would modify the behavior of the system.

The methodological purpose of this article is to show that new analytical approaches such as systems dynamics and its related simulation techniques have made systems analysis not only possible but increasingly useful for political science purposes. As we hope to demonstrate, the close study of system dynamics may somewhat modify our view of what systems analysis is and how it can be applied, and may require us to adopt systems thinking closer to Schelling (1978) than to Easton ([1965] 1979).

Applying System Dynamics in Political Science

System dynamics simulations have previously been used in areas such as industrial dynamics and world energy system forecasting. Jay Forrester founded this approach and elaborated its applications in *Industrial Dynamics* (1961) and *World Dynamics* (1971). A considerable number of studies have since established the place of the system dynamics approach in other types of research, including business dynamics. The growing literature on system dynamics documents its

employment throughout the social sciences (Davidssen 2000). John Sterman's *Business Dynamics* (2000) is a classic introduction to these techniques of systems thinking and simulations. However, applications in political science generally appear to be lacking, "Simulation" in the context of system dynamics means that a "target system, with its properties and dynamics, is described using a system of equations which derive the future state of the target system from its actual state" (Gilbert and Troitzsch 1999: 27).[2] As we shall see, system dynamic simulation models are defined by stocks and flows, and by the variables and constants affecting these flows.[3]

We have here endeavored to apply system dynamics to an area that is of fundamental concern to political science, and perhaps constitutes a prerequisite for the emergence of its modern forms: the worldwide spread of democracy over the last two centuries. The application will be made primarily in order to discern why democracy (in global, systemic-dynamic terms) has been diffused. Expressed in system dynamics terminology, our question becomes: which flows, variables, and constants affected changes in the stock of democratic polities in the world system of states between 1800 and 2000, and how? The yearly flows to and from the stock of democratic states is explained by analogy to the Bass model, as defined by Sterman (2000). Since this model has been developed for analyzing the diffusion of innovations, one important implication is that, in consequence of including changes from soft power as a variable, it can be a paradigm for understanding social change in any population of social units. In addition, the model can be used for analyzing forces behind and changes in soft power over time in the international system of states. Thus, it can also make more understandable to international organizations involved in providing aid programs for such purposes the dynamics and prerequisites for the diffusion of democracy.

Soft Power, Democratizations, and International versus National Political Systems

One of the subsystems in the extra-societal environment in Easton's diagram cited above is the international political system. Normally, systems analysis translates into *national* system analysis. Far less frequently, a systems approach has been applied on the level of the international system as a whole, that is, the world system of nation states. This is perhaps why political scientists are reluctant to explain regime change by factors operating on the global rather than the national level.

In the case of such a significant example as the analysis of democratization, almost all efforts at explanation are made without reference to global changes. Instead, studies of democratization generally focus on factors at the national or comparative level, i.e., on national level explanatory variables in a number of states. For instance, in empirical political research on why democracy proliferates as a regime type on a world scale (such as Lipset 1960, 1990, Almond & Verba 1963, Dahl 1971, 1989, 1998, Diamond 1992, Hadenius 1992, Diamond & Plattner eds. 1993, Vanhanen 1997, Inglehart 1997, Przeworski & Limongi 1997, Barro 1999, Boix & Stokes 2003, Welzel et al. 2003, Welzel & Inglehart 2005a, 2005b, Inglehart & Wenzel 2005, Hadenius & Teorell 2005, Teorell & Hadenius 2005), we mostly find interpretations in terms of requisites, correlates, and time-specific factors on the national level. Among these are economic wealth and development, industrialization, urbanization, education, peaceful evolution of political competition, equality, control of the military and the police by elected officials, democratic beliefs and political culture, aspirations to liberty, market economy, literacy, trade, percentages of Protestants, prior regime types, relative distribution of power resources, political actors pursuing democracy, well-being, trust, and social structure. These are all factors working primarily on the

national level. Some of them are commonly assessed in nations that are already democracies, rather than among countries that are potential adopters. Therefore, these factors may indicate what is typical for democracies, not the essential preconditions for non-democracies making a transition to democracy. In cases where international influences have already been emphasized in democratization studies, such as Uhlin (1993, 1995), seldom has the whole world system of states been under greater scrutiny. There are a few exceptions, such as Starr (1991), where the "diffusion hypothesis" has been tested empirically over a limited range of years and found valid on the basis of statistical tests. International and historic democracy diffusion is studied in Ward et al. (1997), Kurzman (1998), O'Loughlin et al. (1998), Brinks & Coppedge (2001), Modelski & Perry (2002),[4] Starr & Lindborg (2003), Diamond (2003), and Gleditsch & Ward (2003). Wejnert's multilevel regression of national (development) vs. international (diffusion) factors is a rare and impressive exception that concludes:

> In both the world and regional analysis, however, the importance of development faded with the inclusion of the diffusion variables due to the diffusion factors' remarkably stronger predictive power for democratic growth than the factors of development (2005: 73).

Although non-linearity in the diffusion of democracy with regard to democratization pathways is emphasized in works by Rustow (1970), Linz & Stepan (1996), Lane (1996), Cheibub (1999), Rose & Shin (2001), and others, the grand non-linearity of world system dynamics is seldom explained.

Samuel P. Huntington's *The Third Wave* (1991) is therefore provocative because the waves of democratization he portrays suggest a non-linearity in regime changes in the world system. Democratization, according to Huntington, is not diffused at a constant pace, but in an undulating pattern, implying larger and larger forward spurts, interrupted by periods of retrograde movements slipping from democracy back into non-democracy. Underlying the cumulative number of democracies in the world each year are undercurrents of entries and exits of democracies and non-democracies among emerging polities, as well as transitions from and to democracy by existing states. Such an understanding of international change is very close to the stock and flow approach in system dynamics referred to above. Huntington analyzes change at the level of the world system of states by means of dynamic, independent, global variables, i.e., those changing over long periods of time among (rather than within) nations.

Huntington's explanation of the third wave of democratization is based on factors that may be considered global rather than national.[5] These are (1) the deepening legitimacy problems on a world scale among authoritarian systems, (2) global economic growth that has raised living standards, education, and broadened urbanization, (3) the transformation of national Catholic churches from defenders of the status quo to opponents of authoritarianism, (4) the promotion of human rights in the policies of external actors, and (5) snowballing or demonstration effects.

The last factor, the demonstration effect, is of particular interest from a contingency and systems perspective. First of all, it clearly indicates a dynamic understanding of how most social systems work. Demonstration, imitation, and word-of-mouth effects typify diffusion processes in social systems, mainly because imitation is a means of reducing risk. Doing what others already have done, or are soon likely to do, carries with it the conviction of not losing more in making a new

investment than one's rivals can lose. Instead, it is likely that quickly imitating them will lead to advantages and secure access to resources that are likely to diminish in the long run. From our political science perspective, forces of imitation, snowballing, word-of-mouth effect, and diffusion correspond to what Joseph Nye has called soft power. Such soft power, or "getting others to want what you want,"[6] is normally based on the principle of imitating a pioneer one admires. Our focus will be on the soft power of a political regime type, and how it is diffused by imitation.

Imitation requires communication about what is being imitated. Books, newspapers, radio programs, and television broadcasts have historically enhanced knowledge about political conditions elsewhere, including those prevailing in democracies. Studies of the development of democracy since the 1960s have included communication as a factor in their analyses (Lipset 1960, Cutright 1963, Pye ed. 1963, McCrone & Cnudde 1967). The current availability of time series data on both the diffusion of democracy and means of mass communication makes it possible to relate the two in dynamic models. We are coming closer to achieving dynamic models of what were once merely theories of communication and projecting their long-term effect on society.

ANALYSIS OF POLITY IV DATA AND RESULTS OF THE MODIFIED BASS MODEL

The Paradox of System versus Individual Causation

Can the diffusion of democracy within the world system of states be understood as only one of many examples of how units in a social system generally change over time? If there are causes at the world system level, can we learn from studies other than those of *political* innovation diffusion when we address these questions? Research on technical innovations reveals that they diffuse with only minor deviations from mathematically predictable patterns. Yet most adopters are strongly convinced that their choice of a product or process is unique. We seem to accept this paradox without much consideration: on the one hand we have individuals who adopt innovations on the basis of conscious choices and personal preferences. One the other hand, taken collectively these adoptions exhibit such patterns of innovation diffusion at the aggregate level as can be predicted (Bass 1969, Rogers 1995). Moreover, if we compare the adopters' backgrounds, we generally find that the most successful ones are better informed, better educated, and wealthier. Thus, at least two innovation selection mechanisms are operating simultaneously: at the system (or aggregate) level we find something close to a mathematical logic, while on the individual level we find stochastic correlations with personal preferences and background factors.

[Figure 1 about here]

As can be seen in Figure 1, there is near mathematical precision in the global diffusion of democratic institutions in the world system of states (93% of the variance in democracy diffusion is explained by logistic curve estimation). As we shall see later, the raggedness and wave-like pattern of the democracy diffusion curve are caused by "births" and "deaths" of non-democracies

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and democracies in combination with transitions and reversals among them. Yet, as mentioned above, citizens and their elites often consider themselves to be independent, conscious adopters of democracy, generally viewing their achievement of this type of regime as the culmination of political struggles they have fought and won. Thus, there are fundamental discrepancies in the logic of democracy diffusion on the global, national, and citizen levels. The logic of these levels requires quite different scientific approaches and methods of analysis. In the present study, aspects of democracy diffusion will be addressed at the aggregate level, rather than taking a comparative or individual approach.

The Use of Polity IV and IVd Data on "Institutionalized Democracy"

Along with Modelski & Perry (2002), Polity IV data, as well as the specific Polity IVd data set (a condensed version with only those years included in which a regime variable changes), will be employed. Drawing on these unique data we can study the growth in the number of democracies and non-democracies, and see how the total number of polities have changed since 1800 (Figure 2).

[Figure 2 about here]

Data show aggregate levels of three populations of polities (democracies, authoritarian, and totalitarian states) for each year from 1800 to 2000. The data used in this figure is based on the Polity IV regime panel data set in which, beginning in 1800, all countries with a population larger than 500,000 are coded annually according to an array of institutional variables (one of which is "institutionalized democracy"). This variable is expressed on an 11 point scale (0–10) where, following the Modelski & Perry study (2002), a score of 6 or more is defined as "democracy".

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Marshall & Jaggers (2000) define the Polity IV variable "institutionalized democracy" as consisting of three interdependent elements: (1) the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders, (2) the existence of institutionalized constraints on the exercise of power by the executive, and (3) the guarantee of civil liberties to all citizens in daily life and acts of political participation. Other aspects of pluralistic democracy, such as the rule of law, a system of checks and balances, and freedom of the press, among others, are considered means toward, or specific manifestations of, these general principles.

The institutionalized democracy indicator is an additive scale derived from the weighted coding of four variables: (a) competitiveness of executive recruitment, (b) openness of executive recruitment, (c) constraints on the chief executive, and (d) competitiveness of political participation (Table 1).

[Table 1 about here]

The highest value (10) is achieved on the scale (a) if "competitiveness of executive recruitment" is "election" (+2), "openness of executive recruitment" is "dual/election" or "election" (+1), "constraints on the chief executive" is "executive parity or subordination" (+4), and "competitiveness of political participation" is "competitive" (+3). If none of the levels listed are reached, the sum total is then zero (which in this study is defined as totalitarianism, since all the institutions of democracy are lacking). In addition to following Modelski & Perry (2002) in defining the minimum value of institutionalized democracy as 6, we will consider all polities with values from 1 to 5 as "authoritarian".

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The above definition of institutionalized democracy and the operationalization of democracy is open to criticism on various grounds. The reason it is employed here is primarily technical and comparative: (a) it is the only operational definition offered for the single dataset available, and (b) it is also the one used by Modelski & Perry (2002).[7] Space does not permit a comprehensive listing of all the institutional democracies in the world (see the listing in Appendix 1 and the country-by-country case description on the Polity Project home page[8]). Nevertheless, the aforementioned listing appears to support one of the major findings of this investigation: the tendency to imitate or adopt democratic institutions from other countries, i.e., the soft power of democracy as a regime type where information about these democracies is accessible.[9]

It may be noted that what is generally considered the first wave in Figure 2 looks rather like two waves, with the second starting around 1915 and expanding until it reaches a peak at the beginning of the 1920s. The countries involved are primarily from Northern, Central, and Eastern Europe: Denmark (1915), Estonia, Finland, Sweden (1917), Czechoslovakia, Lithuania, Poland (1918), Germany (1919), and Austria and Latvia (1920). The wave from the mid-1940s to approximately the early 1970s includes a large number of former colonies, such as Guatemala (1944), Brazil, Burma (or Myanmar), Sri Lanka (1946), and India (1949), along with re-democratizing polities as well, such as Austria, France (1946), and Italy (1948). Dramatic increases in the number of democracies are also noted for the early 1990s. Not only have previously socialist and post-Soviet republics such as Armenia, Belarus, Estonia, Latvia, Lithuania, Macedonia, Poland, Slovenia, and Ukraine (1991) now democratized, but also Benin, Zambia (1991), Congo Brazzaville, Guyana, Madagascar, Mali, Niger, Paraguay, and Peru (1992). No wave is easily classified in geographic or historic terms (see Appendices 1 and 2.)

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Upon more closely examining the number of democracies, the dynamics of the world system of states becomes evident in the way totalitarian states (defined as 0 on the "institutionalized democracy" variable) relate to authoritarian ones (defined as scoring 1–5 on the same variable). We see totalitarianism making gains from the early 1900s until about 1980, then declining rapidly—primarily in consequence of the fall of the Soviet empire, together with most of its Eastern and Central European satellites. However, these states not only adopt democracy, but at a later point some also feed back into the stock of authoritarian states. More recent figures (2000–2003) show that we now have as many authoritarian as we do totalitarian states. In addition, we can see that the number of democracies is approximately the same as the sum total of authoritarian and totalitarian states combined. But which stocks of democracies and non-democracies are involved, and what flows there are between them, cannot be detected using these aggregate figures. Despite our interest in transitions to democracy over the last two centuries and the increased stock of democracies that have resulted, we still cannot grasp the underlying polity population dynamics. We somehow need to separate the flows, while at the same time analyzing them, so that we know exactly how many states transition from non-democracies to democracies each year and vice versa—and why.

Separate flows in the system of states between the stocks of non-democracies and democracies are not easily grasped by means of statistics. Related time series data are difficult to model in their dynamic (i.e., time-varying) influence upon each other.[10] Therefore, the approach taken here is to use software capable of analyzing flows between stocks. The Polity IV regime panel data is coded into a system dynamics simulation or stock-and-flow model (in this case, using Powersim software[11]). Compared with most system dynamics simulations, the modeling in this study, in its

original form, uses real regime panel data (Polity IVd). Only in a subsequent step is one of the flows of this real data model of the world's stocks of democracies and non-democracies simulated, along with the flows or transitions between them (i.e., the flow of transitions from non-democracy to democracy).

The fact that we use a statically defined measurement for democracy, that is, a single standard for the whole period, will in no way contradict the dynamic and non-linear assessment and analysis of democracy proposed here. On the contrary, a dynamic analysis requires static scales to measure the dynamics. Even if we define democracy here in the simplest possible way (as ≥ 6 on the institutionalized democracy scale), the analysis may well be extended by studying the diffusion of other new forms and interactions of evolving democratic institutions.

Finally, we will employ Banks Cross-National Time-Series Data on mass communication, specifically, the number of radios and television sets (per capita values of radios and television sets are national means) each year of the twentieth century, as a basis for estimating two major components of communicating experiences of democracy with non-democracies. Banks data are the most commonly used source for a diverse set of historic variables that include communication. We do realize, however, that unfortunately communication time series data is lacking for most other components of communications between the two types of polities during the period investigated here.

Using Real Data in a System Dynamics Simulation Approach
The flows we are suggesting here consist of global streams of national democratizations, together with the underlying processes that affect net democratization figures worldwide. Thus, as noted

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above, emergences or entry events ("births") and exits or disappearance events ("deaths") of institutionalized non-democracies and democracies are included, as well as the flows of states into democracies and drifts back to non-democracies ("transitions" and "reversals").

By including entries and exits of non-democracies and democracies, and the transitions in both directions between the two kinds of regimes, the basic Bass model, interpreted in a generalized way, defines the possible changes in the population system of global democratization. However, determination of the global system of states leaves no room for probabilities.

Models of change should be applicable to change of any kind. Thus, the transitions between two states in a population of entities, such as the existence or non-existence of democracy or any other political institution (e.g., female suffrage, the rule of law, or a proportional election system) should also be capable of simulation and analysis. The model presented here can be applied for all social change between any dichotomous states A and B among *n* units.

The methodology we propose is based on empirical data, although a simulation program is employed to process that data dynamically. First, a real-world replica of democratization over the last two centuries is formulated as a system dynamics model filled with regime panel data. Several flows can then be analyzed separately or simultaneously. These flows are the entries, exits, and transitions of non-democracies and democracies already mentioned. Data are extracted from Polity IVd data (see Appendices 1 and 2). Second, one element of this model (in this case the flow from non-democracies to democracies) is exchanged with an "empty" and as yet undefined flow determined by variables and constants, all of which reflect the known Bass with discards diffusion model.[12] After having defined the proposed variables and constants, a

simulation of this particular segment of the model (which is otherwise based on real data) will produce a behavior similar or identical to the previously-known actual behavior, thus indicating a dynamic explanation of why democracy is diffused on a world scale.

Using System Dynamics Simulation for the Empirical Analysis of Democracy Diffusion

The Polity IVd data set, in contrast to the full Polity IV version, includes only those events in which the institutional set-up has changed, making it easier to extract events where polities changed from ≤5 to ≥6 on the institutionalized democracy variable (see Figures 1 and 2). Polity IV is only needed when comparing quantities of polities. Therefore, in the simulations below, the Polity IVd set has been used to extract those polities that emerge ("are born") and disappear ("die") as non-democratic or democratic polities, in addition to cases in which existing polities are democratizing or reverting to non-democracies (see Appendices 1 and 2). On the other hand, the variable "totalitarian percentage of non-democratic states", is derived from the full Polity IV set. It should be emphasized that the model may be elaborated by including additional transitions between values of the variable "institutionalized democracy". This would, however, also complicate the construction of the model and its interpretation.

Although the method is based on system dynamics simulation techniques, the model is first filled with "real" (Polity IVd) data. The flow system defined using the simulation program appears in Figure 3.

[Figure 3 about here]

The two boxes labeled "non-democracies" and "democracies" are defined in system dynamics terminology as "levels", i.e., volumes of each time unit, while the "pipes" to and from them are "flows" determined by "valves" consisting of rates of transition per year. There are two constants in the model, indicated by angled squares: the initial number of democracies in 1800 (one polity, i.e., the US), and the initial number of non-democracies in the same year (21 states, see Appendix A). On the basis of a Polity IVd data set, the years for transitions to democracy and reversals to non-democracy are coded, along with the number of polities emerging or disappearing each year as democracies and non-democracies. Our focus variable, transitions to democracy in number of polities per year from 1800 to 2000, can then be described in graphic form (Figure 4).

[Figure 4 about here]

Figure 4 illustrates what is provided in table form in the last column of Appendix 1: the number of transitions from non-democracies to democracies each year. The next step in the analysis is to exploit the fact that inflows and outflows to and from non-democracies and democracies can now be separated analytically into (a) transitions and reversals, and (b) entries and exits of non-democracies and democracies. For instance, we can see that transitions to democracy (number of non-democratic polities becoming democratic per year) increased after World War I and again after World War II, and then accelerated at the end of the 1980s with the fall of the Berlin Wall.

We thus arrive at the first major advantage of the real data simulation approach advocated here: our causal analysis can concentrate on the separate processes of transitions to and reversals from democracy without having to combine them in gross flows. Reversals into non-democracies are less frequent (as can be seen in Appendix 1). Entries and exits of non-democracies and

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democracies also reflect valuable state and nation-state building patterns, the treatment of which is beyond the scope of the present investigation (see their frequencies in Appendix 2). Therefore, the fact that regime entry ("birth"), regime exit ("death"), democratization, and what we may term "de-democratization" can be outcomes of wars, invasions, violence, and aid are not considered here. For our purposes, they only represent alternate ways in which regimes emerge or disappear, transform into democracies, or undergo reversals into non-democracies. Wars between sovereign states and invasions are also phenomena on an international, rather than global, system level. The system modeled with real data is then used as the point of departure for a replicated model in which transitions from non-democracies to democracies are simulated.

The present article, in focusing on transitions to democracies, analyzes them by means of simulations apart from other transitions in the model. A duplicate of the model is thus created and modified in two steps. First, the real-data transition to democracy flow is replaced by employing an empty flow. Second, this flow is determined by the factors defined above (analogous to the Bass model with discards in Figure 3). (Copied variables are indicated by the suffix "copy".)

At this point, we can analyze the extent to which transitions to democracy are actually determined by entries, exits of democracies and nondemocracies. The "advertising" of democracy by means of democratic ideas, in combination with transitions prompted by accounts of existing democracies, are given and defined by the Bass model. As discussed earlier (see also Endnote 12), transitions attributed to democratic ideas are conditioned by the effectiveness of communications, while transitions due to the soft power of democracy are affected by the communication rate and the transition fraction (see Figure 5). In fact, the Bass model is largely analogous to the two-step hypothesis in classical communication theory (Katz & Lazarsfeld

1955), in which step one refers to direct influences (Bass's effects prompted by advertising) and step two to indirect influences from opinion leaders (Bass's effects prompted by word-of-mouth).

[Figure 5 about here]

From this initial simulation of transition to democracy[13] (see Figure 5), we can see clearly that much of the raggedness in the true democracy diffusion curve is due simply to the entry and exit rates of non-democracies and democracies and the reversals from democracy rates. The simulated democracy diffusion curve is striking in its similarity to the real curve, but less exponential for the period beginning about 1950.

Assumptions and Implications of the first Standard Bass Model Simulation

In this model that incorporates real data, the communication effectiveness of democratic "propaganda" in non-democracies is considered a constant. It must be set to a very small figure (0.0005) in order not to produce a curve that increases too much in the early 1800s: as noted before, it is in this initial diffusion phase that the "advertising" factor plays a role. The communication effectiveness has to increase drastically from 0.0005 for the period from 1800 to 1980 and reach approximately 0.4 by 2000, without changing other parameters, in order to produce the number of democracies we know to be correct. This explosion of communication effectiveness in non-democracies over the last twenty years of the twentieth century does not seem likely, although it may be a partial truth over the short run. Democratic forces in the former Soviet bloc probably found spreading propaganda easier because of *glasnost* and the relaxed control of the opposition under Gorbachev, which in turn may have caused a sudden increase in the effectiveness of communicating the virtues of democracy. This also implies that, given what

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we know from the real data diffusion curve, the communication effectiveness of democratic forces in non-democracies was very small, especially during the first years of democracy. Thus, it appears that democratic parties in non-democracies had little impact on democratization on a global scale. Were this not the case, we would have already had a much sharper increase in the numbers of democracies in the early 1800s. Therefore, transition rates caused by democratic ideas in non-democratic countries can be considered insignificant, as a quick glance at the diffusion curve will show. Causes of diffusion must be sought elsewhere. Taking a longer view of the two centuries from 1800 to 2000, *a transition to democracy is most likely the result of the international communication of what it is like to experience democracy*—what can be called the "soft power" of democracy, by analogy with the word-of-mouth effect in the Bass model.

Thus, there must be another, much stronger force that has boosted the diffusion of democracy in the global system since the latter half of the nineteenth century. To speak in terms of the Bass model, this is the word-of-mouth effect—what Nye refers to as soft power in the case of early democracies or, to use Huntington's term, "snowballing". The strong influence on the transition rate produced by internationally communicated democratic experiences equals *the product of the number of democracies, number of non-democracies, communication rate, and fraction of polities that transition into democracy as a result of such communication, divided by the number of states* (see Endnote 12).

In this first test of the Bass model, the communication rate and transition fraction must be set to small values (1.5 and 0.015).[14] The increase in soft power has its peak in influencing transitions to democracy when the numbers of non-democracies and democracies are equal (a point reached at some time in 1991).

The rate of communication and the percentage of countries that became democratized as a result of these communications are two additional factors determining transitions attributable to democratic experience. In this first simulation model (see Figure 5) the factors mentioned are all constants, having the same value each year from 1800 to 2000. The total number of states (TotalNoOfStatesSim = DemocraciesSim + NonDemocraciesSim) must also be simulated in order to include it each year as a variable in the equation. According to the new model we have two variables available to explain the pattern of the transitions to democracies due to democratic experience: the CommunicationRate and the TransitionFraction. The communication rate expresses how often active adopters of democracy communicate politically with potential adopters. The value of the communication rate for the initial mode simply means that each year, from 1800 to 2000, actors in every democratic polity communicated with a number of actors in non-democratic countries in a way that transmitted their experience of democracy. Such international communications may be facilitated by political philosophers, diplomats, journalists, or by such mass media as radio, TV, globalized broadcasting, cell phones, and the Internet. The fraction of communications that actually lead to democratization rates probably also vary over time. In our case, data from the Banks Time Series will be used to elaborate the estimate of communication rates.

Elaboration of the Model

The model in Figure 5 produced a simulation of actual transitions to democracy. This simulation followed real data raggedness in the curve of transitions to democracy, but failed to boost transition figures over the last fifty years. As we noted, actual data suggest a pattern closer to an exponential function after about 1950. Following World War II, during the Cold War years, and

after the fall of the Berlin Wall, there seem to have been other forces at work altering communication rates between nation states.

One could assume an increase in communication rates as a logistic function, just as in any diffusion process (Bass 1969, Rogers 1995). However, the use of actual data to the greatest extent possible is preferable. Therefore, Banks Times series data on the number of radios and television sets across the globe have been employed as a proxy or indicator for overall communication about political, as well as everyday, life in democracies—specifically, the annual global averages of the national averages in per capita values in *non-democracies*, as defined by the Polity IV data set. However, since newspaper data from the nineteenth century are not very reliable, a base value has been introduced instead, to which the global national averages of radios and (later) television sets in non-democracies have been added (see Figures 6 and 7). The communication rate is estimated on the assumption that new technologies provide possibilities for that rate to increase non-linearly, both because innovations normally diffuse logistically, and because transitions into democracies affect the average per capital values of communication in the stock of non-democracies left after such transitions. As is seen in Figure 7, the resulting curves exhibit a reverse wave in the late 1970s as a consequence of transitions of countries with high per capita values of communication into democracies. One also notes that, contrary to what is traditional in democracy diffusion studies, communication in non-democracies (rather than democracies) is used as a time-series variable to model transitions to democracy.

[Figure 6 about here]

[Figure 7 about here]

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The transition fraction is not constant over time, as in the case of the simple Bass models considered earlier. The transition fraction is defined as the number of times a communication event between an active and a potential adopter of democracy results in the adoption of democracy, and may change over time. Thus, transitions to democracy resulting from word-of-mouth, i.e., the soft power of democracy, not only depend on how many non-democracies and democracies there are, and how much they communicate, but also on the transition fraction or the fraction of communications that transforms the attractiveness of democracy into actual steps taken towards it by non-democracies (see Endnote 12). This transition fraction has undergone change over time as some regimes are more receptive to the soft power of democracy than others. Totalitarian regimes can be considered "immune" to it, since they are closed societies and lack any of the critical democratic institutions listed in Table 1.

[Figure 8 about here]

Figure 8 shows how the totalitarian share of non-democracies rose from almost nothing in 1880 to 90% a century later. By 2000, however, the international situation returned to where some 50% or more of all non-democratic polities were totalitarian. Moreover, authoritarian regimes are likely to be more susceptible to the soft power of democracy than totalitarian states. (Nevertheless, it can be argued that sudden collapses of totalitarian states are also possible, although as "deaths" of non-democracies they are not simulated here.) Totalitarian states, on the other hand, are likely to have a dampening effect on the diffusion of democracy. Consequently, the share of authoritarian and totalitarian regimes among non-democratic nations is a critical factor for the advancement of democratization on the global level. Therefore, the transition

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fraction is defined here as the ratio of authoritarian states among those that are non-democratic (or 100% minus the percentage of totalitarian nations among non-democratic polities divided by 100).

TransitionFraction = (100 – PercentTotalitarianOfNonDemStates) / 100

Definition: The fraction of communications between non-democracies and democracies concerning democracy that will actually cause the non-democracies to take steps toward becoming democracies is defined as a (linear) function of the authoritarian percentage of non-democratic polities (or 100 minus the totalitarian percentage or "immune" polities divided by 100).

This definition completes the extended Bass model of transitions to democracy from 1800 to 2000 (Figure 6). To summarize, the extended version of the Bass model with discards takes into account the fact that some of the potential adopters of democracy are in reality not bona fide since, being closed or traditional, they are resistant to democratization. It is also true that technological innovations over the span of two centuries in the field of mass communications (newpapers, telephones, radio, TV, cell phones, the Internet) have drastically affected communication rates.

[Figure 9 about here]

As may be seen in Figure 9, the actual diffusion of democracy (heavy line numbered "2" in the diagram) is much more closely represented by the simulated spread of democracy (thin line

numbered "3") than was the case in the initial model (Figure 5). The lack of exponential democracy diffusion in the first standard Bass model for the post-World War II period is compensated for by the dynamics of the communication rates and transition fractions in the elaborated model. In the initial model, only one third of the number of actual democracies in 2000 (28 polities) was reached in the simulation run. In the elaborated model (Figures 6 to 8), the simulation stops at 80 of the actual 81 democracies (99%), while the simulated form of the diffusion curve remains very close to the real figures, as shown in Figure 9. This implies that the elaborated model comes much closer to actual figures of transitions to democracy in the last two centuries than the first standard model. Still, there is room for improvement. While space does not permit us to explore this further in the present article, historical studies of the post-World War II transitions to democracy would make it possible to add new or improve statistics on the communication patterns in non-democracies, apart from the data included in the model presented here. Leaving this for future studies, we can instead summarize the dynamic interactions that will impact on transitions to democracy, according to the projections of the elaborated model (Figure 10).

[Figure 10 about here]

In Figure 10 we can see how the transitions to democracy presented earlier (curve 1) are driven primarily by the soft power of democracy (curve 2). These transitions are further boosted by the growth in communication rates (curve 3) resulting from the availability of mass communication technologies in non-democracies, which in turn helps explain transitions to democracy after 1950. The transition fraction (curve 4) based on the proportion of authoritarian states among non-democracies serves to improve the wave fit and smooth out the slight raggedness of the

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simulation curve. Without the transition fraction variable, the model of democracy diffusion would overshoot real figures dramatically for the closing forty years of the twentieth century. The rise of totalitarian vs. authoritarian states from about 1960 to 1980 (an increase from 40% to 90% in the fraction of totalitarian regimes among the non-democratic states) accounts for the trough in democracy diffusion that is seen between 1960 and 1970. Appendix 1 shows the considerable number of non-democracies that have arisen from previously existing states and newly-created decolonized nations. They may be the cause of the delay in global diffusion evident in the simulated curve and the reason employing the transition fraction is crucial for the performance of the model.

The soft power of democracy (curve 2) peaks at the end of the twentieth century, driven by growth in the communication rate and the transaction fraction. However, in the long run this variable will decline and resemble the curve that the word-of-mouth effect showed in the lower diagram of the Bass model (see Figure 11 in Endnote 12). Since the soft power of democracy requires at least one non-democracy to have a defined value, it cannot totally vanish unless all states become democratic.

It may easily be seen that the simulated diffusion of democracy does not precisely follow the course of actual events. For a closer approximation, the model would need to take into account transitions between totalitarian and authoritarian polities. In fact, steps 0 to 10 on the institutionalized democracy scale could be incorporated into the model, although doing so would be extremely complicated and only contribute marginally to understanding the diffusion process. Moreover, it would obscure that fact that the basic principle of innovation diffusion is very

simple: it is an *imitation* effect, and imitation requires communication about what is being imitated.

Given the explosion of new communication technologies, the rapid increase in communication rates, and the rising proportion of authoritarian to totalitarian states, the coming decades should see a great wave of democracy diffusion. The number of democracies estimated today at approximately 90, might climb to almost 110 by the year 2050 (see Figure 1). Such a projected increase would mean an average of one new democracy every second year for the coming four decades. However, considering that the current size of the stock of democracies has grown far above the estimated diffusion curve, we may expect a reverse wave before a new and even stronger tide swells. With the subsequent wave's new adaptations of democratic institutions, and further refinements in the institutions of older democracies, the standard method of national political decision making in the global system of states will most likely become democracy. The attractiveness of democracy (i.e., its soft power) will then paradoxically fade in consequence of its success, as citizens in most countries simply take it for granted. This will necessarily influence the decreasing number of totalitarian states as well, so it would appear that eventually most (if not all) nations will appropriate the more desirable regime type and become democracies.

Some Implications of Results

The analysis of the causes of democracy diffusion will appear provocative to major actors in world politics—primarily those in international and national aid agencies. It concludes that the global spread of democracy is best fostered by improved communication about what is going on inside the world's democracies, rather than by other measures, *unless* those other measures also contribute to improved communications.

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Most political science research concerning democratization has a statistical and national-comparative approach that does not and cannot produce long-term results on a global scale: the data it uses is restricted to the national level, and most often to adopters of democracy rather than potential ones. However, as mentioned earlier, analysis on the global level does not necessarily contradict unit (national) level analysis. For certain periods of time between 1800 and 2000, the correlates of democracy may still be valid for understanding its adoption in a national context, in which case one should preferably compare "immune", potential, and actual adopters in seeking the critical reasons for susceptibility. In the present paper we have tried to show that transitions to democracy primarily result from a systemic interaction among (a) improved communication on the global system level regarding the ways democracies handle political, economic, social, and cultural matters, (b) how attractive democratic countries therefore seem to potential adopters of democracy, but also (c) the ratio of totalitarian polities among non-democracies, which affects how improved communication impacts transition rates. According to our findings, the diffusion of democracy is primarily attributable to soft power and locally-adapted imitations of other well-functioning democratic institutions.

CONCLUSION

This article has been a methodological attempt to analyze the dynamics of contingent behavior in social systems. We sought to do so by applying a system dynamics simulation tool to the issue of democratization among polities in the world system between 1800 and 2000. Using Polity IV, Polity IVd, and Banks Times Series data, we hope to have shown how a Bass diffusion model with discards may help estimate soft power, thereby bringing together several levels of social analysis: the level of system theory and its application in political science, the use of diffusion of innovation models in political analysis, and the employment of a system dynamics simulation tool in place of statistical analysis. We believe it represents a new approach to the study of soft power, attractiveness, or "snowballing" in any social system.

It has been our endeavor to demonstrate a way of implementing system analysis other than by using the conventional input/output/feedback method familiar from Easton ([1965] 1979). The system dynamics approach generally proves itself particularly useful when dealing with a number of units undergoing qualitative change from condition A to condition B (or vice-versa) over a span of time.

This type of qualitative change is usually encountered in analyzing the contingent behavior of units, i.e., behavior not necessarily determined by the characterizations of actors, but by the sequence of actions or perceptions among actors. This is so because incentives for the (as yet) unchanged actors are created and affected by what others do, especially neighboring units, traditional allies, and/or admired units. Soft power, as defined by Nye, is an inherent force driving such aggregate change. As such it can be modeled in relation to the diffusion of any

change. The system dynamic simulation technique (or stock and flow analysis) is well-suited for modeling such aggregate dynamics.

Conceptually, one needs to consider whether the global diffusion of democracy is actually driven by factors like democratic ideas—the experience of democracy as it is working elsewhere—and thus the soft power of democracy. It can be shown that the diffusion of democracy is remarkably analogous to the diffusion of dynamically driven technological innovations. Accepting this analogy, one can estimate the effect of soft power (i.e., the attractiveness of institutionalized democracy) and fully appreciate its historic role in political change.

The major conclusion of our investigation is that the soft power of democracy and the allure of imitation both act as strong, dynamic forces behind democracy diffusion on a global scale, especially when communication technologies make it easy to access information about democracy. Most totalitarian countries showed that they were unable to resist the wave of democracy that swelled at the end of the twentieth century. The growing proportion of authoritarian regimes among non-democratic polities has already affected the rate of transitions to democracy. Our results suggest that that, given improved global and international communication, it has been soft power and reduced "immunity" to political change among totalitarian and authoritarian states that have been the major factors behind the historic spread of democratic institutions worldwide. Actual figures of democracy diffusion are convincingly explained by the proper systemic mix of these factors.

Appendix 1. The Modified Polity IVd Data Set: Polities and Values on the Institutionalized Democracy Scale

		Entry into non-democracy ("born as non-democracy")	Reversal to non-democracy	Entry into democracy ("born as democracy")	Transition to democracy
Initial (= init.) **Year of Polity**					
1800 (Init.)	Afghanistan	1			
	Austria	1			
	Bavaria	1			
	China	1			
	Denmark	1			
	France	1			
	Iran	1			
	Japan	1			
	Korea	1			
	Morocco	1			
	Nepal	1			
	Oman	1			
	Portugal	1			
	Prussia	1			
	Russia	1			
	Spain	1			
	Sweden	1			
	Thailand	1			
	Turkey	1			
	United Kingdom	1			
	United States			1	
	Württemburg	1			
	Total	**21 (Init.)**		**1 (Init.)**	
1806	Saxony	1			
	Total	**1**			
1811	Paraguay	1			
	Total	**1**			
1814	Norway	1			
	Total	**1**			
1815	Modena	1			
	Netherlands	1			
	Papal States	1			
	Parma	1			
	Sardinia	1			
	Tuscany	1			
	Total	**6**			
1816	The Two Sicilies	1			
	Total	**1**			
1818	Chile	1			
	Total	**1**			
1819	Baden	1			
	Total	**1**			
1820	Haiti	1			
	Total	**1**			
1821	Gran Colombia	1			
	Peru	1			
	Total	**2**			
1822	Mexico	1			
	Total	**1**			
1824	Brazil	1			

Year	Country			
	United Provinces	1		
	Total	**2**		
1825	Argentina	1		
	Bolivia	1		
	Total	**2**		
1827	Greece	1		
	Total	**1**		
1828	Peru			1
	Total			**1**
1830	Belgium	1		
	Ecuador	1		
	Serbia	1		
	Uruguay	1		
	Venezuela	1		
	Total	**5**		
1832	Colombia	1		
	Total	**1**		
1835	Peru		1	
	Total		**1**	
1837	United Kingdom			1
	Total			**1**
1838	Costa Rica	1		
	Nicaragua	1		
	Total	**2**		
1839	Guatemala	1		
	Honduras	1		
	Total	**2**		
1841	El Salvador	1		
	Total	**1**		
1844	Dominican Republic	1		
	Total	**1**		

Year	Country				
1847	Liberia			1	
	Total			**1**	
1848	France				1
	Switzerland			1	
	Total			**1**	**1**
1852	France		1		
	Total		**1**		
1853	Belgium				1
	Total				**1**
1854	Orange Free State			1	
	Total			**1**	
1855	Ethiopia	1			
	Total	**1**			
1857	New Zealand			1	
	Total			**1**	
1859	Romania	1			
	Total	**1**			
1861	Italy	1			
	Total	**1**			
1864	Greece				1
	Total				**1**
1867	Canada			1	
	Colombia				1
	Hungary	1			
	Total	**1**		**1**	**1**
1871	Germany	1			
	Total	**1**			
1875	Costa Rica				1
	Total				**1**
1877	France				1
	Total				**1**
1879	Bulgaria	1			
	Spain				1
	Total	**1**			**1**

Year	Country				
1884	Liberia		1		
	Total		**1**		
1886	Colombia		1		
	Total		**1**		
1888	Chile				1
	Total				**1**
1891	Chile		1		
	Total		**1**		
1894	Honduras				1
	Total				**1**
1898	Norway				1
	Total				**1**
1901	Australia			1	
	Total			**1**	
1902	Cuba	1			
	Total	**1**			
1903	Panama	1			
	Total	**1**			
1904	Honduras		1		
	Total		**1**		
1907	Bhutan	1			
	Total	**1**			
1908	Honduras				1
	Total				**1**
1910	South Africa			1	
	Total			**1**	
1911	Portugal				1
	Total				**1**
1914	Albania	1			
	Total	**1**			
1915	Denmark				1
	Greece		1		
	Total		**1**		**1**
1917	Estonia			1	
	Finland			1	

Year	Country				
	Netherlands				1
	Sweden				1
	Total			**2**	**2**
1918	Czechoslovakia		1		
	Lithuania		1		
	Poland		1		
	Yemen, North	1			
	Total	**1**	**3**		
1919	Germany				1
	Total				**1**
1920	Austria				1
	Latvia		1		
	Total		**1**		**1**
1921	Ireland		1		
	Yugoslavia	1			
	Total	**1**	**1**		
1922	Egypt		1		
	USSR	1			
	Total	**1**	**1**		
1923	Spain		1		
	Total		**1**		
1924	Iraq	1			
	Mongolia	1			
	Total	**2**			
1926	Greece				1
	Poland		1		
	Saudi Arabia	1			
	Total	**1**	**1**		**1**
1928	Lithuania		1		
	Total		**1**		
1930	Colombia				1
	Egypt		1		
	Portugal		1		
	Total		**2**		**1**
1931	Spain				1

Year	Country	C1	C2	C3	C4
	Malaysia			1	
	Total			**1**	**1**
1958	Guinea	1			
	Laos			1	
	Pakistan		1		
	Sudan		1		
	Venezuela				1
	Total	**1**	**2**	**1**	**1**
1959	Jamaica			1	
	Singapore			1	
	Tunisia	1			
	Total	**1**		**2**	
1960	Benin	1			
	Burkina Faso	1			
	Cameroon	1			
	Central African Republic	1			
	Chad	1			
	Congo Brazzaville	1			
	Cyprus			1	
	Gabon	1			
	Ghana	1			
	Ivory Coast	1			
	Korea, South				1
	Laos		1		
	Madagascar	1			
	Mali	1			
	Mauritania	1			
	Niger	1			
	Nigeria			1	
	Senegal	1			
	Somalia			1	
	Togo	1			
	Total	**15**	**1**	**3**	**1**

Year	Country	C1	C2	C3	C4
1961	Brazil	1			
	Korea, South	1			
	Rwanda	1			
	Sierra Leone			1	
	Syria	1			
	Tanzania	1			
	Turkey				1
	Total	**2**	**3**	**1**	**1**
1962	Algeria	1			
	Burundi	1			
	Dominican Republic				1
	Myanmar (Burma)		1		
	Trinidad			1	
	Uganda			1	
	Total	**2**	**1**	**2**	**1**
1963	Kenya	1			
	Kuwait	1			
	Peru				1
	Total	**2**			**1**
1964	Chile				1
	Malawi	1			
	Zambia	1			
	Total	**2**			**1**
1965	Congo (Kinshasa)	1			
	Gambia			1	
	Singapore		1		
	Sudan				1
	Total	**1**	**1**	**1**	**1**
1966	Botswana			1	
	Dominican Republic		1		
	Guyana	1			

	Country				
	Lesotho			1	
	Nigeria		1		
	Total	**1**	**2**	**2**	
1967	Greece		1		
	Sierra Leone		1		
	Uganda		1		
	Yemen, South	1			
	Total	**1**	**3**		
1968	Ecuador				1
	Equatorial Guinea	1			
	Mauritius			1	
	Peru		1		
	Swaziland	1			
	Total	**2**	**1**	**1**	**1**
1969	Malaysia		1		
	Philippines		1		
	Somalia		1		
	Total		**3**		
1970	Ecuador		1		
	Fiji			1	
	Lesotho		1		
	Zimbabwe			1	
	Total		**2**	**2**	
1971	Bahrain	1			
	Qatar	1			
	Sudan		1		
	Turkey		1		
	United Arab Emirates	1			
	Total	**3**	**2**		
1972	Bangladesh			1	
	Total			**1**	
1973	Argentina				1
	Chile		1		

	Country				
	Pakistan				1
	Turkey				1
	Uruguay		1		
	Total		**2**		**3**
1974	Bangladesh		1		
	Guinea-Bissau	1			
	Total	**1**	**1**		
1975	Angola	1			
	Comoros	1			
	Greece				1
	Mozambique	1			
	Papua New Guinea			1	
	Total	**3**		**1**	**1**
1976	Argentina		1		
	Portugal				1
	Vietnam	1			
	Total	**1**	**1**		**1**
1977	Djibouti	1			
	Pakistan		1		
	Total	**1**	**1**		
1978	Burkina Faso				1
	Dominican Republic				1
	Solomon Islands			1	
	Spain				1
	Total			**1**	**3**
1979	Ecuador				1
	Ghana				1
	Nigeria				1
	Total				**3**
1980	Burkina Faso		1		
	Peru				1
	Turkey		1		

Year	Country			
	Total	**2**		**1**
1982	Bolivia			1
	Ghana	1		
	Honduras			1
	Total	**1**		**2**
1983	Argentina			1
	Turkey			1
	Zimbabwe	1		
	Total	**1**		**2**
1984	El Salvador			1
	Nigeria	1		
	Total	**1**		**1**
1985	Brazil			1
	Honduras	1		
	Uruguay			1
	Total	**1**		**2**
1986	Sudan			1
	Total			1
1987	Fiji	1		
	Philippines			1
	Total	**1**		**1**
1988	Korea, South			1
	Pakistan			1
	Total			**2**
1989	Chile			1
	Honduras			1
	Panama			1
	Sudan	1		
	Total	**1**		**3**
1990	Bulgaria			1
	Czechoslovakia			1
	Fiji			1
	Germany		1	
	Haiti			1
	Hungary			1

Year	Country				
	Namibia			1	
	Nicaragua				1
	Total			**2**	**6**
1991	Armenia			1	
	Azerbaijan	1			
	Bangladesh				1
	Belarus			1	
	Benin				1
	Croatia	1			
	Estonia			1	
	Georgia	1			
	Haiti		1		
	Kazakhstan	1			
	Kyrgyzstan	1			
	Latvia			1	
	Lithuania			1	
	Macedonia			1	
	Moldova	1			
	Poland				1
	Slovenia			1	
	Tajikistan	1			
	Turkmenistan	1			
	Ukraine			1	
	Uzbekistan	1			
	Zambia				1
	Total	**9**	**1**	**8**	**4**
1992	Albania				1
	Congo			1	
	Brazzaville				
	Guyana				1
	Madagascar				1
	Mali				1
	Mongolia				1
	Niger				1
	Paraguay				1

Year	Country				
	Peru		1		
	Russia				1
	Taiwan				1
	Thailand				1
	Total		**1**	**1**	**10**
1993	Czech Republic			1	
	Eritrea	1			
	Lesotho				1
	Moldova				1
	Russia		1		
	Slovak Republic			1	
	Yemen	1			
	Total	**2**	**1**	**1**	**2**
1994	Dominican Republic		1		
	Gambia		1		
	Haiti				1
	Malawi				1
	Mozambique				1
	Total		**2**		**3**
1995	Armenia		1		
	Belarus		1		
	Georgia				1
	Total		**2**		**1**
1996	Albania		1		
	Dominican Republic				1
	Guatemala				1
	Niger		1		
	Romania				1
	Total	**2**			**3**
1997	Albania				1
	Congo Brazzaville	1			
	Mexico				1
	Total	**1**			**2**
1998	Armenia				1
	Total				**1**
1999	Indonesia				1
	Nepal				1
	Pakistan	1			
	Total	**1**			**2**
2000	Croatia				1
	Georgia	1			
	Haiti	1			
	Russia				1
	Senegal				1
	Yugoslavia				1
	Total	**2**			**4**
2001	Ghana				1
	Peru				1
	Total				**2**
2002	East Timor			1	
	Kenya				1
	Nepal	1			
	Total	**1**		**1**	**1**
2003	Armenia	1			
	Serbia and Montenegro			1	
	Total	**1**		**1**	

Source: Polity IV (Polity value 6–10 coded as 1, Polity value 0–5 coded as 0)

Note: Values for the year 1800 ("Init.") are initial values, not transitions, entries or exits that year.

Appendix 2. Exits of Non-Democracies and Democracies 1800–2003

Year	No. of Non-Democracies	Country	No. of Democracies	Country
1832	1	Gran Colombia		
1838	1	United Provinces		
1860	4	Modena		
		Parma		
		Tuscany		
		The Two Sicilies		
1861	1	Sardinia		
1870	1	Papal States		
1871	5	Bavaria		
		Prussia		
		Wûrttemberg		
		Saxony		
		Baden		
1902			1	Orange Free State
1910	1	Korea		
1920	1	Serbia		
1940	3	Lithuania		
		Latvia		
		Estonia		
1945	1	Germany		
1975	1	Vietnam, South		
1976	1	Vietnam, North		
1990	3	Yemen, North	1	Germany, West
		Germany, East		
		Yemen, South		
1991	1	USSR		
1992			1	Czechoslovakia
Total	25		3	

Source: Polity IVd. For coding, see Appendix 1. Listed by order of age as polity.

Appendix 3. Equations of the model in Figure 6.

init   Democracies = InitNoDem

flow   Democracies = + dt * EntryDem

            – dt * ExitDem

            – dt * ReveralslFromDemRate

            + dt * TransToDemRate

doc   Democracies = The number of active adopters of democracy in the system, which is increased by adoption and decreased when adopters reverse their regimes into non-democracy and "reenter the market" for democracy.

init   DemocraciesSim = InitNonDemCopy

flow   DemocraciesSim = – dt * ReversalFromDemRateCopy

            – dt * ExitDemCopy

            + dt * EntryDemCopy

            + dt * TransitionToDemRateSim

doc   DemocraciesSim = The number of active adopters of democracy in the system, which is increased by adoption and decreased when adopters reverse their regimes into non-democracy and "reenter the market" for democracy.

init   NonDemocracies = InitOfNonDem

flow   NonDemocracies = – dt * ExitNonDem

            + dt * EntryNonDem

            + dt * ReveralslFromDemRate

            – dt * TransToDemRate

doc   NonDemocracies = The initial number of potential but non-democratic state adopters of democracy is determined by the total population size of states in the world system and the current number of active adopters of democracy. It is reduced by adoption of democracy and increased when adopters reverse their democratic regimes and "reenter the market" of democracy.

init   NondemocraciesSim = InitOfNonDemCopy

flow   NondemocraciesSim = – dt * ExitNonDemCopy

            + dt * ReversalFromDemRateCopy

            + dt * EntryNonDemCopy

            – dt * TransitionToDemRateSim

doc   NondemocraciesSim = The initial number of potential but non-democratic state adopters of democracy is determined by the total population size of states in the world system and the current number of active adopters of democracy. It is reduced by adoption of democracy and increased when adopters reverse their democratic regimes and "reenter the market" of democracy.

aux   EntryDem = GRAPHSTEP(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,2,3,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,3,1,1,0,0,0,1,0,0,1,1,2,3,1,2,0,0,1,2,0,1,0,2,0,1,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0,2,8,1,1,0,0,0,0,0,0,0,0"Min:0;Max:10;Zoom"])

doc   EntryDem = The number of polities per year being founded as democracies.

aux   EntryDemCopy = GRAPHSTEP(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,2,3,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,3,1,1,0,0,0,1,0,0,1,1,2,3,1,2,0,0,1,2,0,1,0,2,0,1,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,0,2,8,1,1,0,0,0,0,0,0,0,0"Min:0;Max:10;Zoom"])

doc   EntryDemCopy = The number of polities per year being founded as democracies.

aux   EntryNonDem = GRAPHSTEP(TIME,1800,1,[0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,6,1,0,1,1,1,2,1,0,2,2,0,1,0,0,5,0,1,0,0,0,0,0,2,2,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,0,1,0,1,0,0,0,0,1,0,0,0,1,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,

0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,1,1,0,2,0,1,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,2,2,0,1,0,0,1,2,0,0,1,1,15,3,2,
2,2,1,1,1,2,0,0,3,0,0,1,3,1,1,0,0,0,0,0,0,0,0,0,0,0,0,9,0,2,0,0,0,0,0,
0,0"Min:0;Max:20;Zoom"])

doc   EntryNonDem = The number of non-democratic polities per year appearing as polities.

aux   EntryNonDemCopy =
GRAPHSTEP(TIME,1800,1,[0,0,0,0,0,0,1,0,0,0,0,1,0,0,1,6,1,0,1,1,
1,2,1,0,2,2,0,1,0,0,5,0,1,0,0,0,0,0,2,2,0,1,0,0,1,0,0,0,0,0,0,0,0,0,1,
0,0,0,1,0,1,0,0,0,0,0,1,0,0,0,1,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,1,1,0,0,0,1,0,0,0,0,0,0,1,0,0,0,1,0,0,1,1,0,2,0,1,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,2,2,0,1,0,0,1,2,0,0,1,1,15,3,2,
2,2,1,1,1,2,0,0,3,0,0,1,3,1,1,0,0,0,0,0,0,0,0,0,0,0,0,9,0,2,0,0,0,0,0,
0,0"Min:0;Max:20;Zoom"])

doc   EntryNonDemCopy = The number of non-democratic polities per year appearing as polities.

aux   ExitDem =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,1,0,0,0,0,0,0,0,0,0"Mi
n:0;Max:10"])

doc   ExitDem = The number of democratic polities per year disappearing as polities.

aux   ExitDemCopy =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,1,0,0,0,0,0,0,0,0,0"Mi
n:0;Max:10"])

doc   ExitDemCopy = The number of democratic polities per year disappearing as polities.

aux   ExitNonDem =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,4,1,0,0,0,0,0,0,0,1,5,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,3,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,3,1,0,0,0,0,0,0,0,0,0,0"Mi
n:0;Max:5;Zoom"])

doc   ExitNonDem = The number of non-democratic polities per year disappearing as polities.

aux   ExitNonDemCopy =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,4,1,0,0,0,0,0,0,0,1,5,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,3,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,3,1,0,0,0,0,0,0,0,0,0,0"Mi
n:0;Max:5;Zoom"])

doc   ExitNonDemCopy = The number of non-democratic polities per year disappearing as polities.

aux   ReveralslFromDemRate =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,1,0,0,0,0,1,0,0,0,
0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,1,0,0,1,0,1,0,2,
0,0,1,2,0,3,0,0,1,1,0,0,1,1,0,0,0,2,0,1,0,0,0,1,0,0,0,2,0,1,3,1,0,0,1,2,
3,1,3,2,2,0,2,1,0,1,1,0,0,2,0,1,1,1,1,0,1,0,1,0,1,1,1,2,2,2,1,0,1,2"Mi
n:0;Max:10;Zoom"])

doc   ReveralslFromDemRate = The reversal rate is the rate of democracy reversal into non-democracy per year.

aux   ReversalFromDemRateCopy =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,

0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,1,0,0,0,0,1,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,1,0,0,1,0,1,0,2,
0,0,1,2,0,3,0,0,1,1,0,0,1,1,0,0,0,2,0,1,0,0,0,1,0,0,0,2,0,1,3,1,0,0,1,2,
3,1,3,2,2,0,2,1,0,1,1,0,0,2,0,1,1,1,1,0,1,0,1,0,1,1,1,2,2,2,1,0,1,2"Mi
n:0;Max:10;Zoom"])

doc   ReversalFromDemRateCopy = The reversal
rate is the rate of democracy reversal into non-democracy per year.

aux   TransitionToDemRateSim =
TransFromDemIdeasSim + TransFromSoftPowerOfDemSim

doc   TransitionToDemRateSim = The rate at which
a non-democratic state becomes an active adopter of democracy
(the simulated transitions to democracy).

aux   TransToDemRate =
GRAPHSTEP(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,
0,0,0,0,0,0,0,0,1,0,0,1,0,0,0,0,0,0,0,1,0,0,0,1,0,0,0,0,0,0,0,0,1,0,0,0,
0,0,1,0,0,0,1,0,0,0,0,0,0,0,0,0,1,0,0,1,0,0,0,1,0,2,0,1,1,0,0,0,0,0,1,0,
0,0,1,1,0,0,0,0,0,1,0,0,0,0,0,0,0,2,0,4,0,1,0,1,0,2,0,1,0,1,1,1,0,1,1,1,1,
1,1,0,0,1,0,0,0,0,3,0,1,1,0,3,3,1,0,2,2,1,2,1,1,2,3,6,4,10,2,3,1,3,2,1,
2,4"Min:0;Max:10;Zoom"])

doc   TransToDemRate = The rate at which a non-
democratic state becomes an active adopter of democracy.

aux   CommunicationAboutDemRate = 0.0375 +
(RadiosPerCapitaInNonDem / 2) + TVSetsPerCapitaInNonDem

doc   CommunicationAboutDemRate = The rate at
which the experience of democracies is communicated to non-
democracitic polities.

aux   PercentageAuthoritarianOfNonDemStates =
(100 – PercentTotalitarianOfNonDemStates) / 100

aux   PercentTotalitarianOfNonDemStates =
GRAPH(TIME,1800,1,[71.43,66.67,71.43,71.43,71.43,66.67,68.18
,63.64,59.09,54.55,54.55,56.52,60.87,60.87,62.5,70,70.97,70.97,68
.75,66.67,61.76,61.11,59.46,59.46,56.41,53.66,53.66,54.76,56.1,56
.1,50,50,48.94,52.17,52.17,51.06,51.06,52.17,50,48.98,51.02,46,46
,46,45.1,45.1,45.1,45.1,40,40,42,41.18,43.13,44,44,43.14,43.14,43.

14,43.14,42.31,38.46,32.65,29.17,31.25,34.04,34.04,36.17,34.04,3
4.04,29.79,29.79,28.26,23.81,21.43,21.43,21.95,21.95,25,22.5,25,2
2.5,22.5,22.5,20,19.51,19.51,19.05,19.05,19.51,19.51,19.51,19.05,
19.05,19.05,21.95,21.95,21.95,21.95,22.5,22.5,25,25,24.39,28.57,2
7.91,25.58,23.26,27.27,23.26,27.91,25.54,24.39,23.81,22.5,23.81,2
1.95,21.95,23.08,21.95,25,26.32,23.68,25.64,30.77,30.95,39.02,36.
36,36.36,40,42.22,46.67,51.16,51.16,50,55.32,59.57,65.31,60.42,5
8.33,52.94,52.73,45.28,47.17,43.64,39.62,40.38,41.67,42,48.08,53.
85,55.77,54.72,60.78,61.54,62.96,63.64,61.82,64.81,71.43,71.93,6
9.86,69.74,70.51,70.73,71.08,78.73,77.65,79.55,77.53,77.42,74.74,
77,84,87.76,83,85.29,90.2,88.35,86,82.65,83.67,83.84,85.57,85.42,
85.42,84.21,84.04,84.04,83.7,77.78,70.59,58.43,61.25,56.79,56.41,
54.43,58.23,58.97,52.56,47.44,46.75"Min:1;Max:100;Zoom"])

doc   PercentTotalitarianOfNonDemStates = Percent
polities with 0 on the 0–10 Polity IVd scale of institutionalized
democracy.

aux   RadiosPerCapitaInNonDem =
GRAPH(TIME,1800,1,[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0.0
1,0.01,0.01,0.02,0.016,0.02,0.022,0.024,0.027,0.02,0.022,0.022,0.0
22,0.022,0.022,0.022,0.022,0.027,0.028,0.033,0.038,0.041,0.044,0.
045,0.047,0.051,0.056,0.062,0.065,0.065,0.07,0.063,0.071,0.081,0.
087,0.092,0.099,0.1,0.101,0.104,0.104,0.103,0.109,0.115,0.123,0.1
25,0.124,0.129,0.134,0.14,0.152,0.162,0.17,0.172,0.183,0.194,0.20
1,0.215,0.285,0.288,0.296,0.292,0.229,0.224,0.221,0.228,0.228,0.2
39,0.239,0.239,0.244"Min:0;Max:1;Zoom"])

doc   RadiosPerCapitaInNonDem = Number of
radios per capita (mean among non-democratic nations each year)

aux   TotalNoOfStates = Democracies +
NonDemocracies

aux   TotalNoOfStatesSim =
DemocraciesSim+NondemocraciesSim

doc   TotalNoOfStatesSim = The total number of polities in the world system of states.

aux   TransFromDemIdeasSim = NondemocraciesSim * CommunicationEffectivessnessSim

doc   TransFromDemIdeasSim = Adoption of democracy can result from political struggle among potential adopters of democracy.

aux   TransFromSoftPowerOfDemSim = DemocraciesSim * NondemocraciesSim * CommunicationAboutDemRate * TransitionFraction / TotalNoOfStatesSim

doc   TransFromSoftPowerOfDemSim = Adoption of democracy by adaptive imitation, determined by democratic political communication rate between potential and active adopters of democracy, and fraction of times these interactions will result in adoption of democracy. Adaptive imitation effect is small if number of active adopters of democracy relative to total population of states in world system is small.

aux   TransitionFraction = PercentageAuthoritarianOfNonDemStates

doc   TransitionFraction = Fraction of times communication event between active and potential adopter of democracy results in adoption of democracy.

aux   TVSetsPerCapitaInNonDem = GRAPH(TIME,1800,1,[0,0.001,0.001,0.001,0.002,0.003,0.006,0.008,0.01,0.013,0.016,0.019,0.021,0.023,0.027,0.029,0.034,0.036,0.039,0.043,0.045,0.046,0.049,0.054,0.057,0.063,0.068,0.072,0.077,0.078,0.083,0.089,0.091,0.094,0.096,0.098,0.086,0.091,0.091,0.093,0.102,0.109,0.114,0.114,0.113,0.116"Min:0;Max:1;Zoom"])

doc   TVSetsPerCapitaInNonDem = Number of TV sets per capita (mean among non-democratic nations each year)

const   CommunicationEffectivessnessSim = 0.0005

doc   CommunicationEffectivessnessSim = Political campaigning results in adoption of democracy according to effectiveness of political campaigning.

const   InitNoDem = 1

const   InitNonDemCopy = 1

const   InitOfNonDem = 21

const   InitOfNonDemCopy = 21

Figure 1. Diffusion of Democracy in World System of Nations: Actual Data and Logistic Diffusion Curve
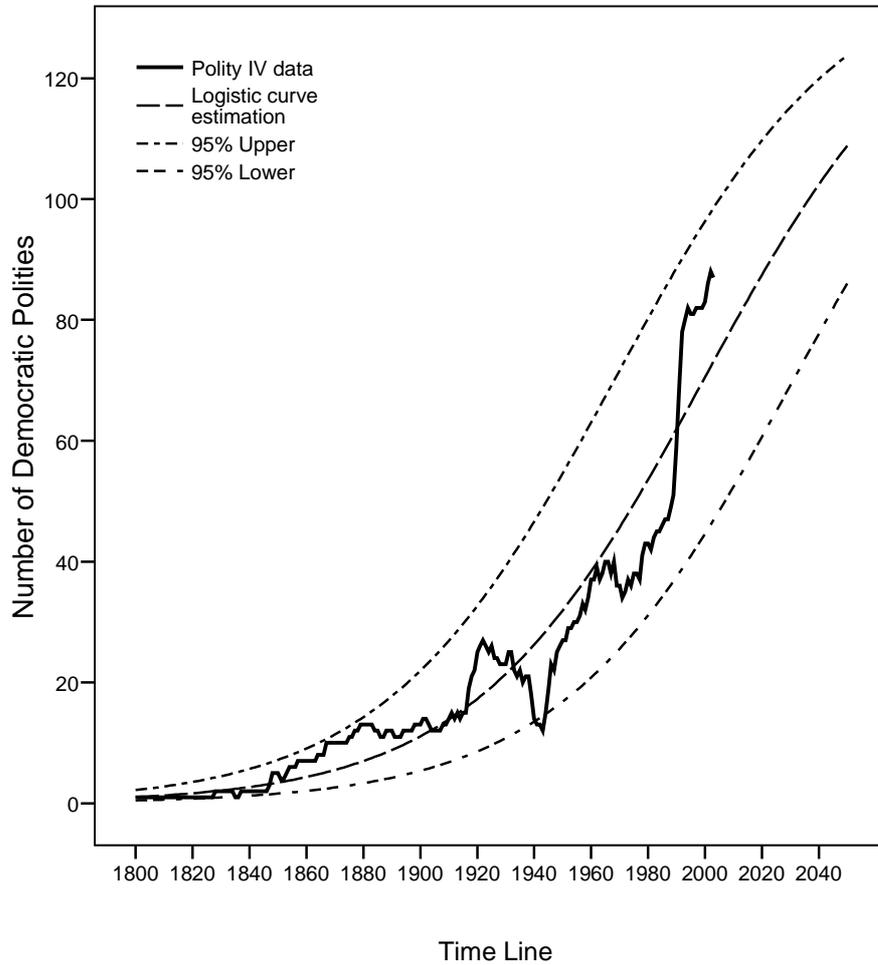
Source: Polity IV data.

Note: New democracy has been defined as at least 6 on the "institutionalized democracy" variable (see discussion in text).

A regression of this curve estimation yields an R^2 of 0.93, with regression coefficient b

significant at 99% level. The logistic diffusion curve has the equation:

$Y = 1 / (1 / u + (b0 * b1^t))$ or $\ln(1 / y - 1 / u) = \ln(b0) + (\ln(b1) * t)$

where u is upper boundary value, in this case set to 140 (final no. of democracies), and upper and

lower boundaries of confidence intervals = 95%.. Curve estimation in this case is thus:

ln (1 / Polity IV data on No. of Institutionalized Democracies – 1 / 140)

Figure 2. Polity Population Dynamics 1800–2000: Democratic, Authoritarian and

Totalitarian States
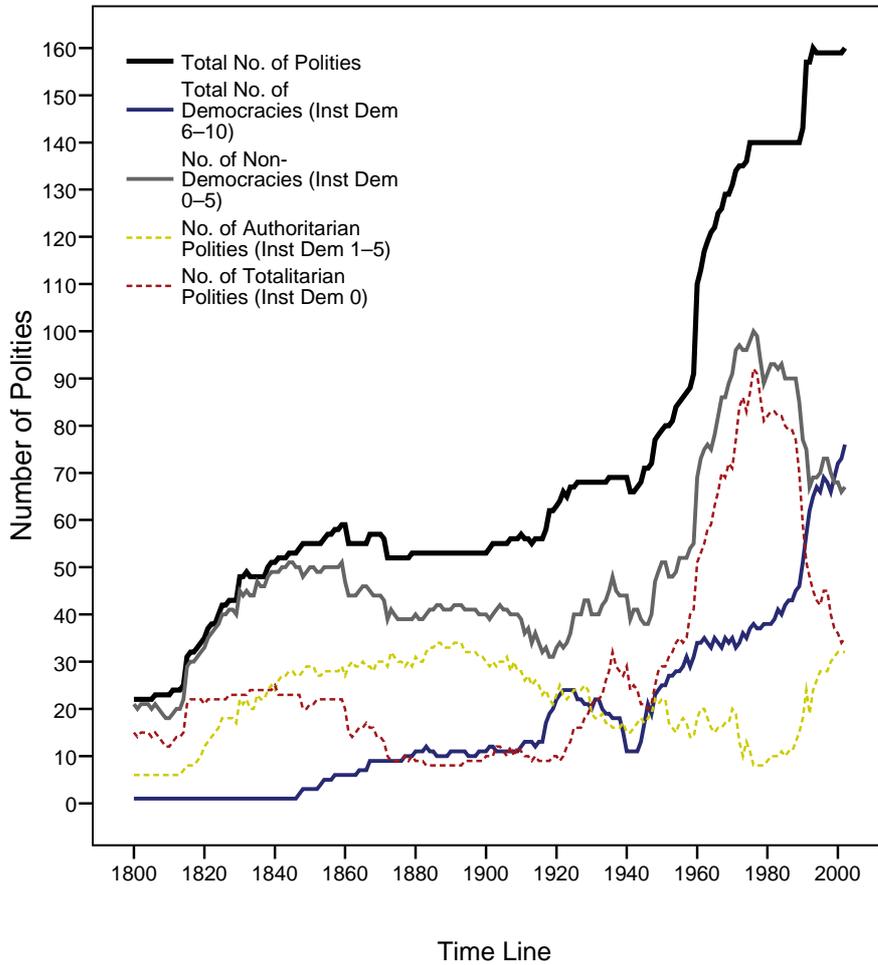
Source: Polity IV data.

Note: Figures in parentheses indicate how polities are defined in terms of their value as an

institutionalized democracy variable in the Polity IV data set: totalitarian states have a value of 0,

authoritarian have 1–5, and non-democracies have 0–5, including totalitarian and authoritarian

components. Values of democracies are 6–10. (See creation of the variable in Table 1 and

comments in the text.)

Figure 3. A Simple Stock and Flow Model of Diffusion of Institutionalized Democracy in the World System of States 1800–2000
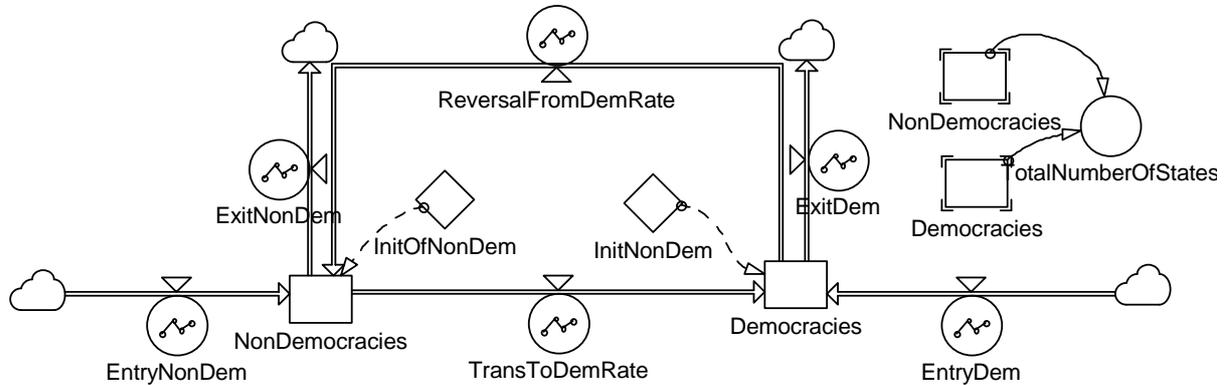
Note: Structure of stock and flow diagram is analogous to the Bass model as defined by Sterman (2000). Stocks of non-democracies, democracies, and flows (rates) are defined in correspondence with data sets Polity IV and IVd. Init. of non-democracies (n = 21) and democracies (n = 1) are constants denoting initial number in 1800. See data in Appendices 1, 2, and 3.

Equations: Democracies = + dt * EntryDem – dt * Exit_Dem – dt * ReversalFromDemRate + dt * ActualTransToDemRate. NonDemocracies = – dt * ExitNonDem + dt * EntryNonDem + dt * ReversalFromDemRate – dt * ActualTransToDemRate

Figure 4. Transitions to Democracies 1800-2000 (Number of Polities per Year)
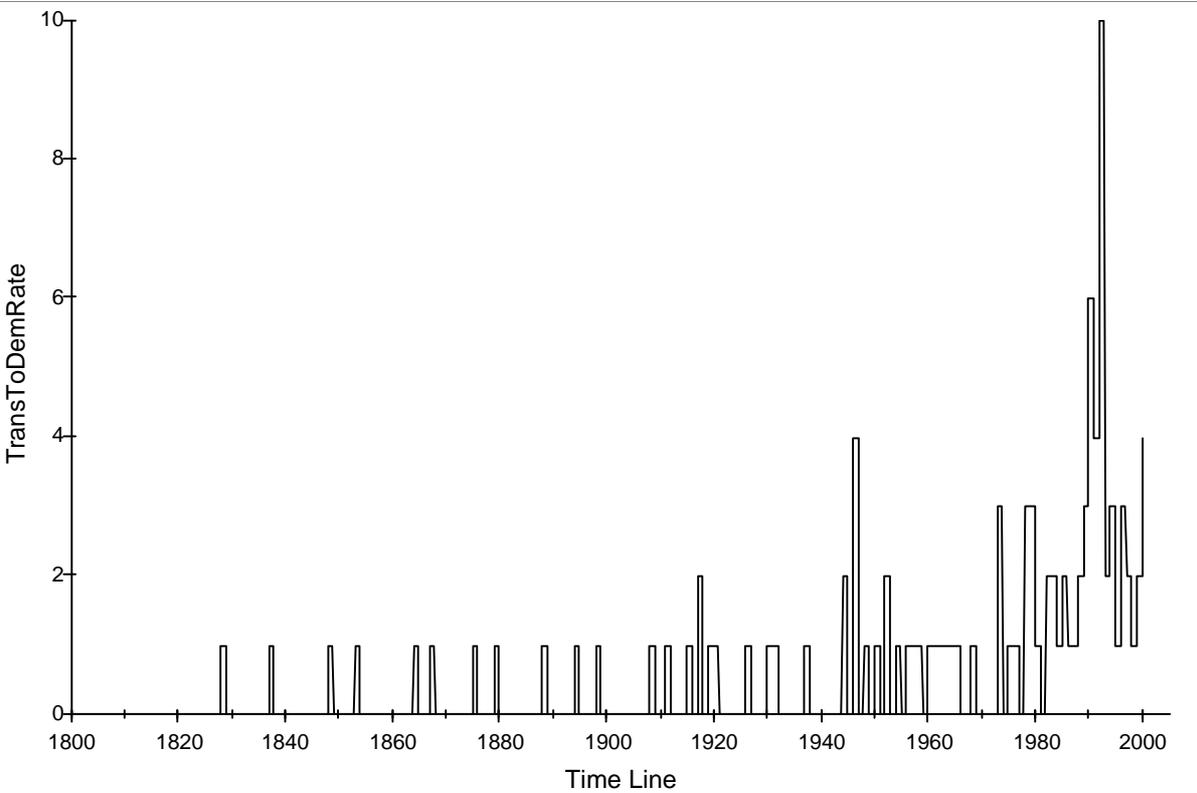
Source: Polity IVd

Note: See Appendix 1 for details on polity transitions to democracy.

Figure 5. First Standard Bass (with Discards) Model of Democratization in the World System
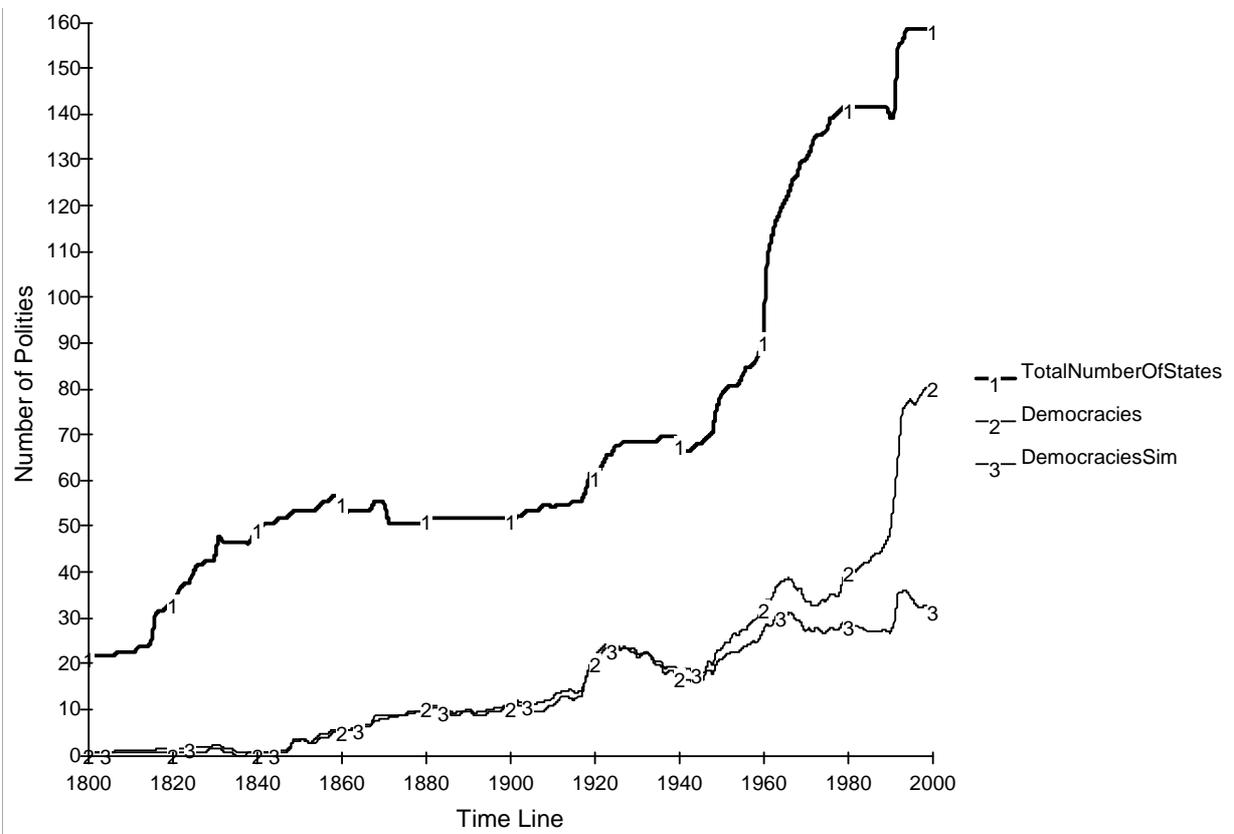
Source: Polity IVd

Figure 6. The Elaborated Bass Model of Democracy Diffusion 1800–2000
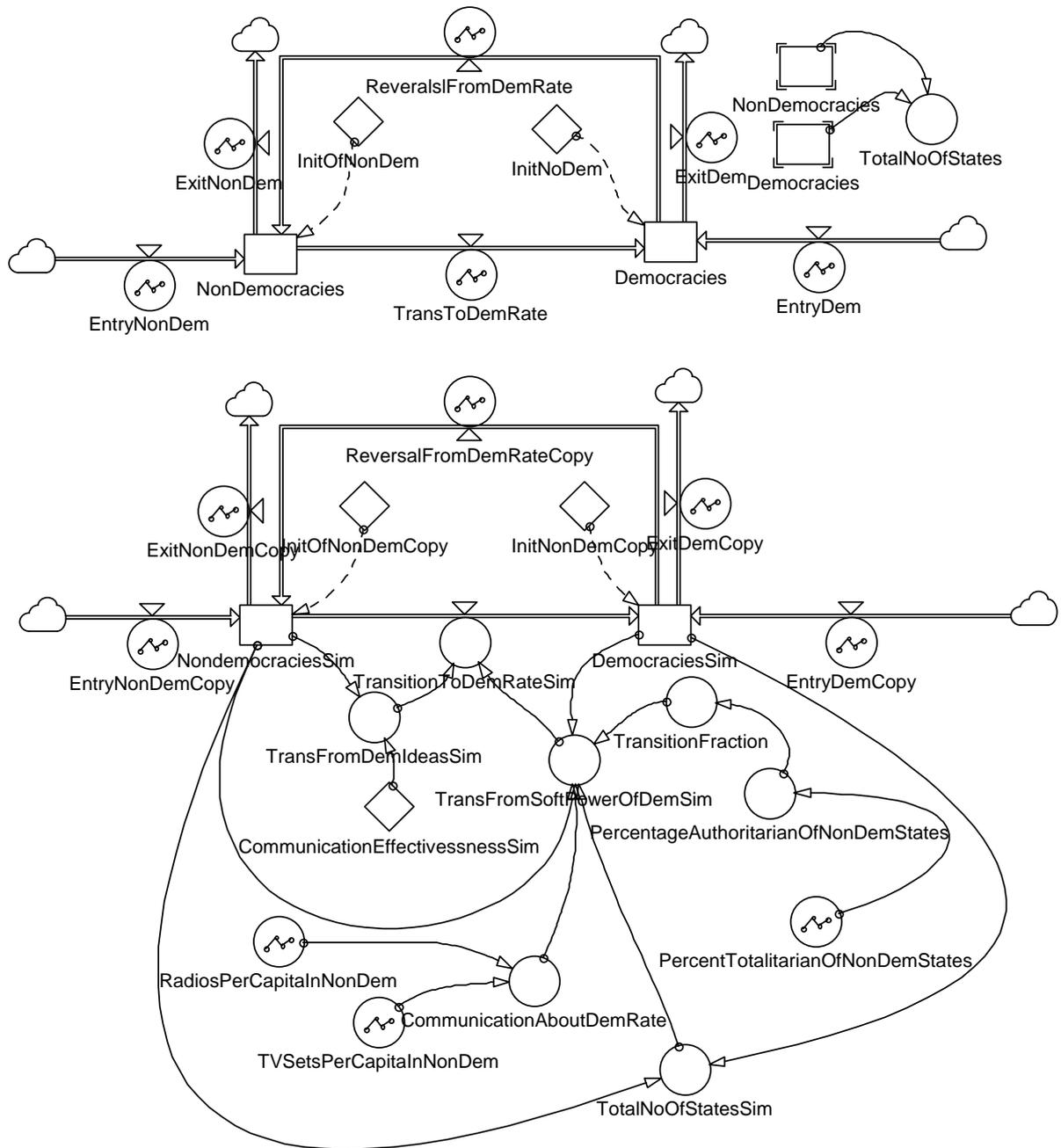
Source: Polity IVd and Databanks International. Banks Cross-National Time-Series Data Archive.

Note: Lower model is a copy of upper, except that actual transitions to democracy

(TransToDemRate) are replaced by a simulated flow (TransitionToDemRateSim). This is

determined by factors analogous to Bass with discards model (see Figure in Endnote 12), as

further elaborated using data sources below (see text).

Figure 7. The Global Communication Rates About Democracy in Non-Democracies 1800-2000
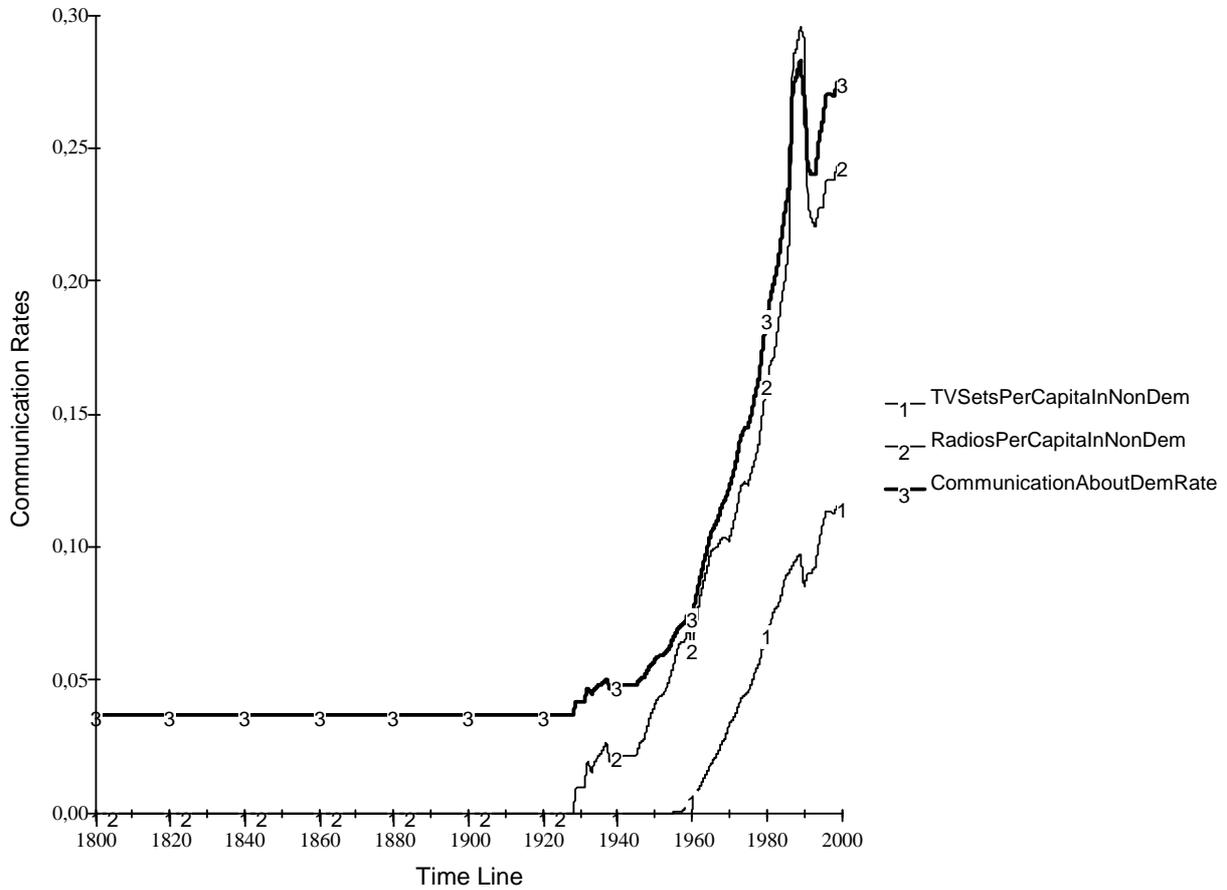
Source: Databanks International. Banks Cross-National Time-Series Data Archive. Per Capita values of radios and television sets are yearly means of national means in non-democracies as defined by the Polity IV data set (see definitions in Figure 1, Table 1, and list of countries in Appendix 1).

Note: CommunicationAboutDemRate equation defined as 0.0125 + (RadiosPerCapitaInNonDem / 2) + TVSetsPerCapitaInNonDem. Thus, radios are considered as having half the effect of TV sets on communication rates.

Figure 8. Percentage Totalitarian of Non-Democratic Polities 1800–2000
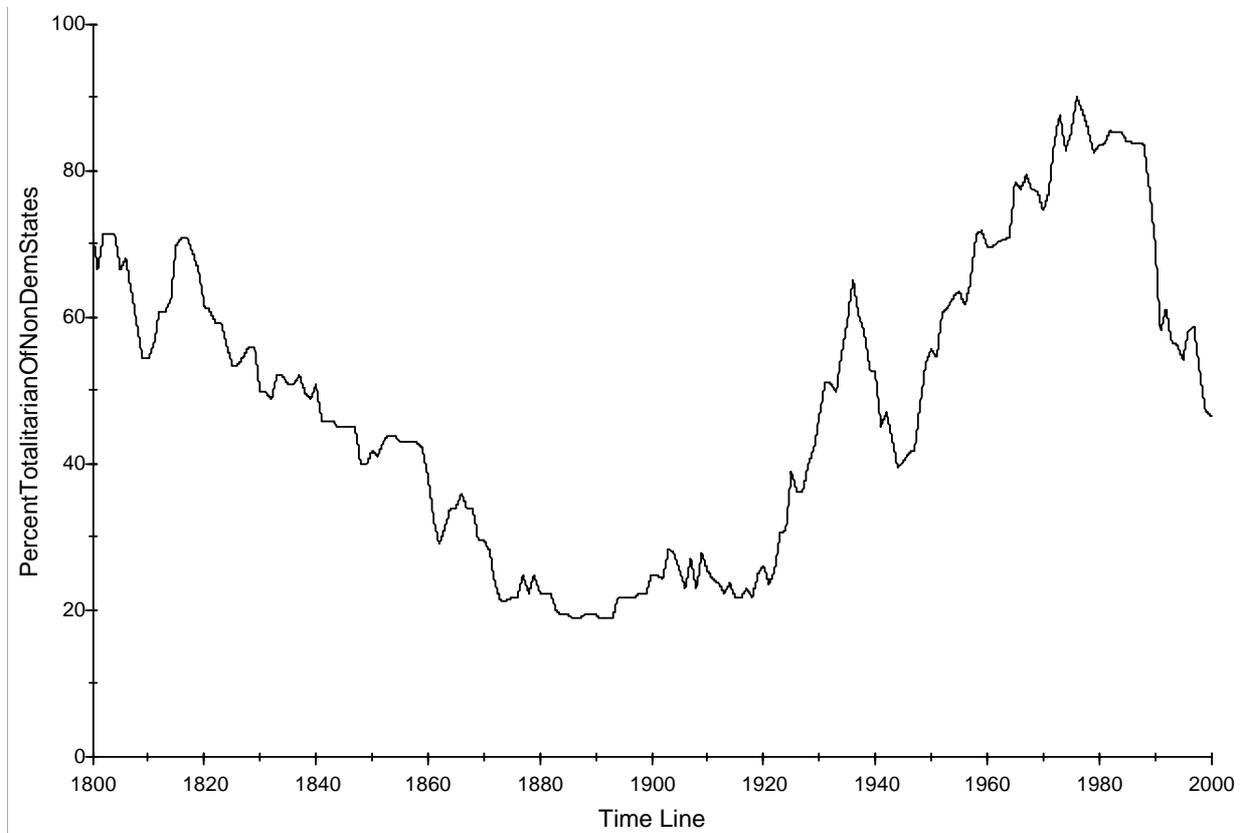
Source: Polity IV

Note: For definitions of totalitarian and non-democratic polities, see Figure 2

Figure 9. Diffusion of Democracy 1800–2000: Actual Total of States, Actual Total of Democracies, and Simulated Number of Democracies (using model in Fig. 6)
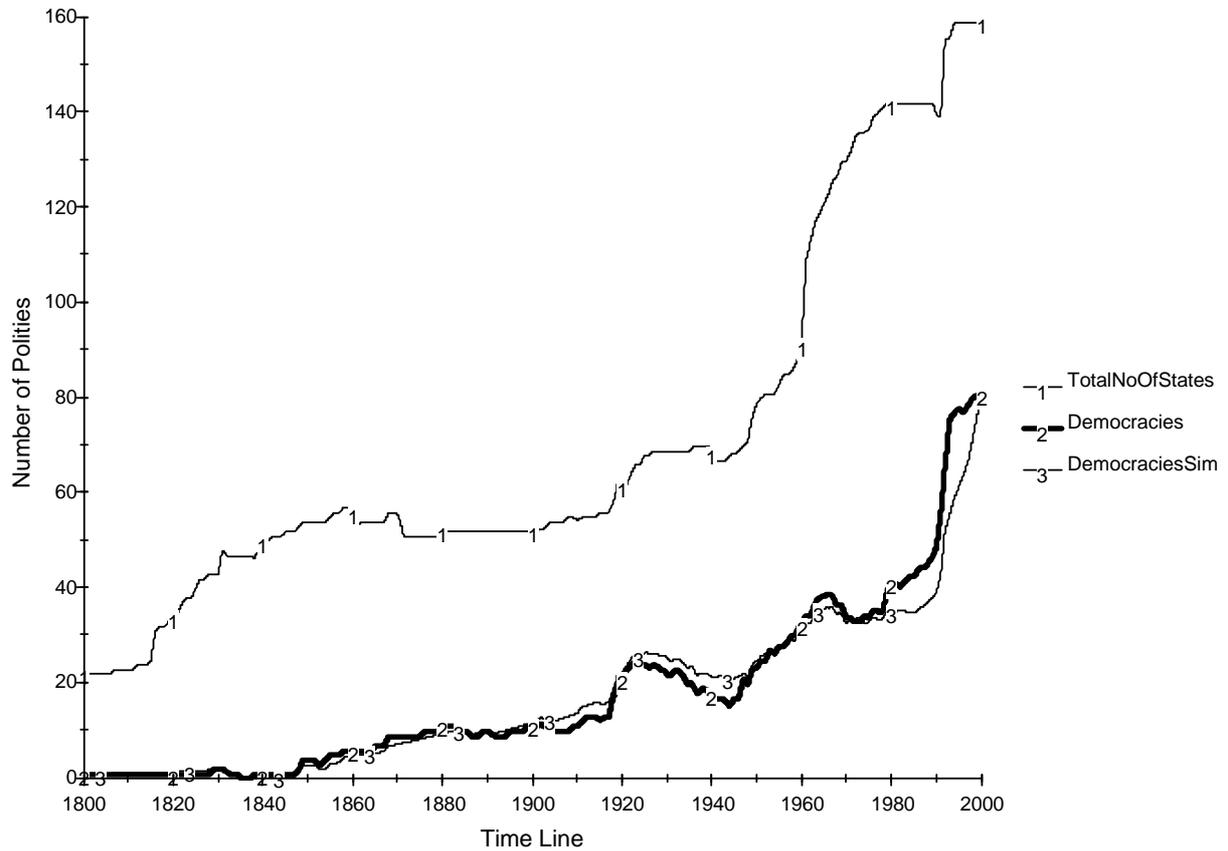
Source: Polity IVd, Polity IV data, Databanks International. Banks Cross-National Time-Series Data Archive.

Note: Init: DemocraciesSim = InitNoDemCopy, flow: DemocraciesSim = − dt * ReversalFromDemRateCopy − dt * ExitDemCopy + dt * EntryDemCopy + dt * TransToDemRateSim. For complete equation of model, see Appendix 3.

Figure 10. Actual Transitions to Democracy Rates, Simulated Transitions due to Soft Power of Democracy, Communication Rates, and Transition Fractions
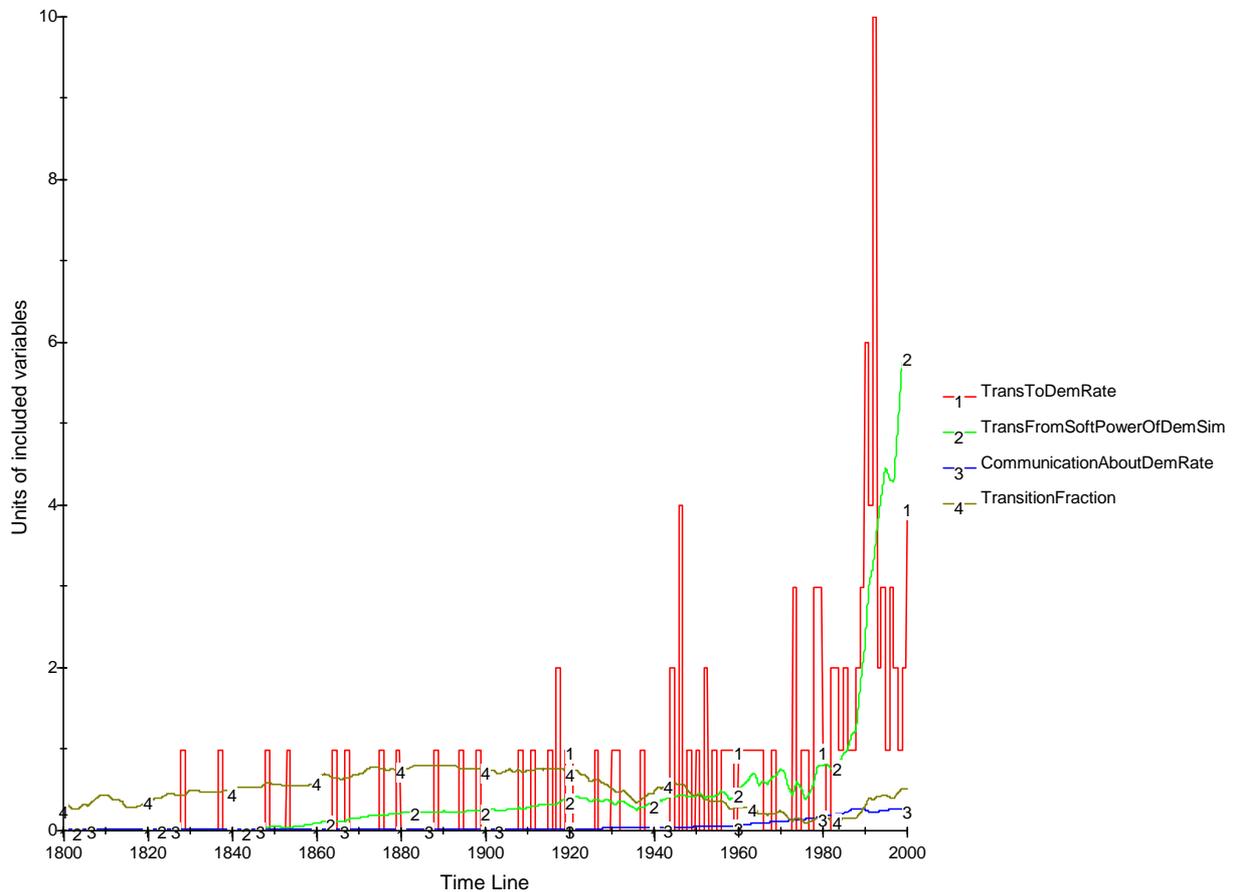
Source: Polity IVd and Polity IV data, Databanks International. Banks Cross-National Time-Series Data Archive. Per Capita values of radios and television sets are yearly means of national means in non-democracies as defined by Polity IV data set. (See definitions in Figure 1 and Table 1, and list of countries in Appendix 1.)

Note: Units as in equations in Figure 6 and Appendix 3.

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Figure 11. Bass Diffusion Model with Discards
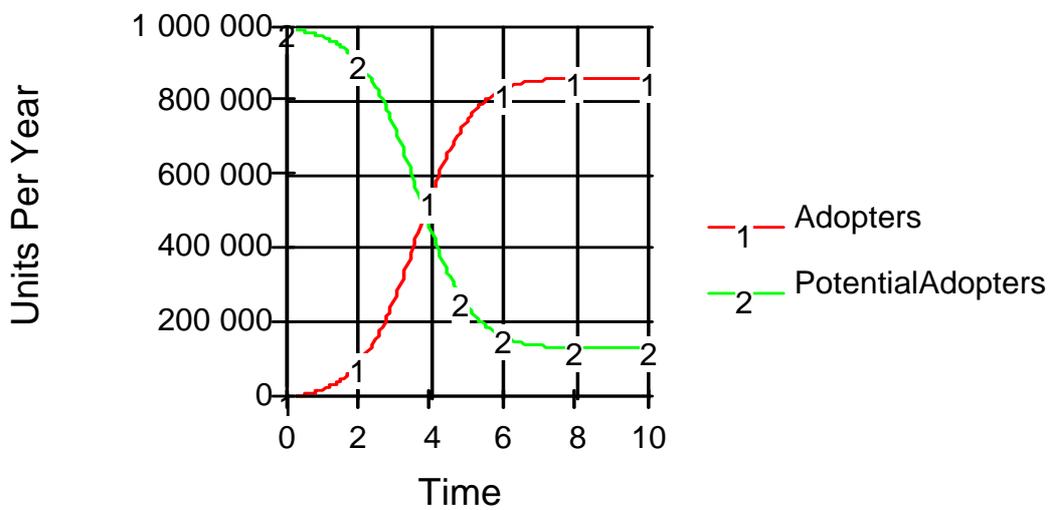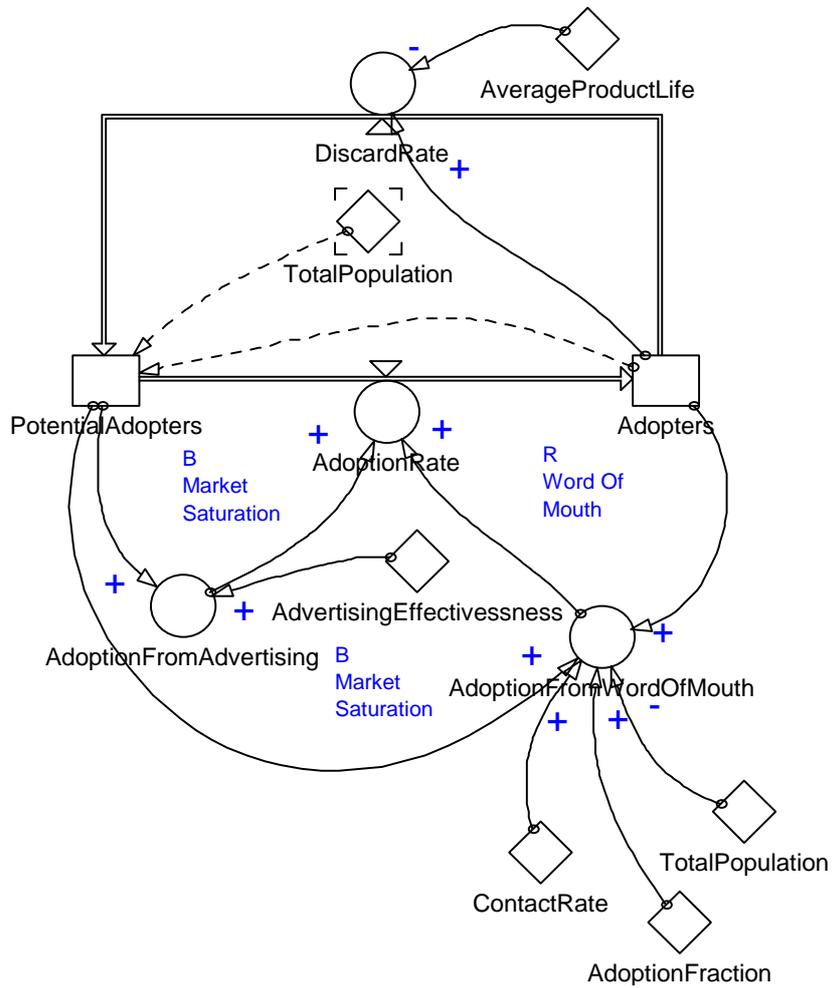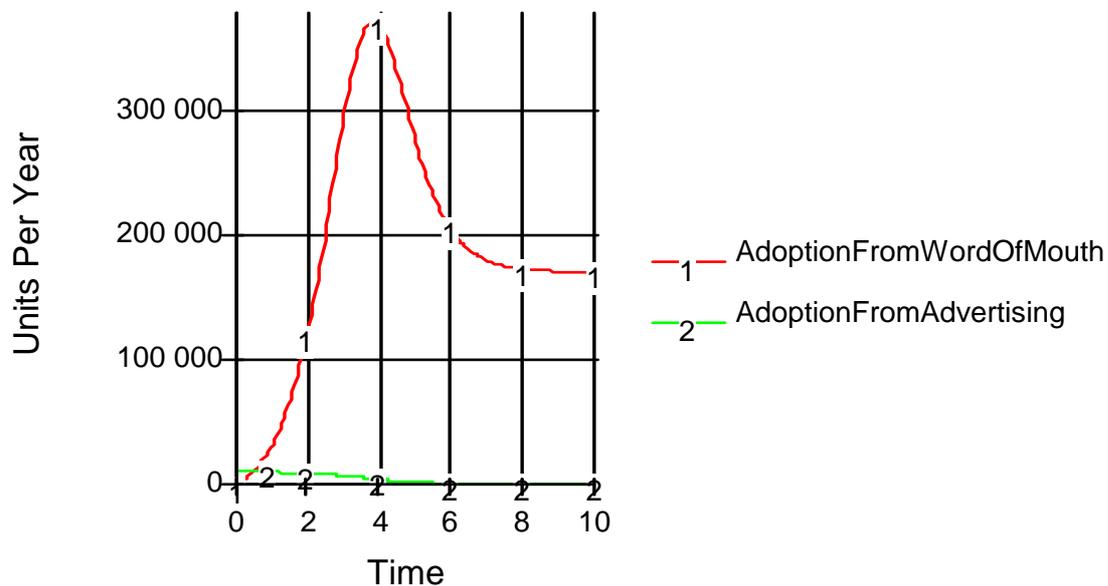
Note: Double arrows denote flows from and to stocks of adopters and potential adopters of product A. Boxes indicate stocks (volumes of adopters or potential adopters), while single arrows indicate influence exerted by variables (circles) and constants (angled squares) on other variables. As seen in attached diagrams, levels and variables can both be dynamically described. R indicates (1) reinforcing loops (the more adoption of A, the more adoption from word-of-mouth, the higher the adoption rate, the more adoption of A, etc.), and B (2) balancing loops (the more adoption from advertising, the higher the adoption rate, the fewer potential adopters, the lower adoption from advertising, the lower the adoption rate, etc.). Notice in the lower diagram the minor contribution of adoption from advertising in relation to adoption from word-of-mouth.

Source: Sterman 2000.

Table 1. Polity IV Variables and Weights in Coding of Institutionalized Democracy

Authority Coding   *Scale Weight*

Competitiveness of Executive Recruitment:

(3) Election   +2

(2) Transitional   +1

Openness of Executive Recruitment:

(3) Dual/election   +1

(4) Election   +1

Constraints on Chief Executive:

(7) Executive parity or subordination: +4

(6) Intermediate category   +3

(5) Substantial limitations   +2

(4) Intermediate category   +1

Competitiveness of Political Participation:

(5) Competitive   +3

(4) Transitional   +2

(3) Factional   +1

Source: Marshall and Jaggers, 2002, p. 14.

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DATA SETS

Polity IV and Polity IVd

Databanks International. Banks Cross-National Time-Series Data Archive. Available from

Trinity College Web site: http://library.trincoll.edu/timeseries/index.cfm (accessed March 27,

2008).

ENDNOTES

[1] Particularly after Elster's *Explaining Technical Change* (1983) and *Making Sense of Marx* (1985), in which the author elaborates on why "functionalism" should be considered illegitimate in the social sciences, but not in biology. For a critique of Elster, see Stinchcombe (1985).

[2] There are several types of simulation techniques used in social science, and different rationales for using them. For a general overview, see Gilbert and Troitzsch (2005). Also Cole et al. (1975) give valuable historical and comparative insights into global simulation modeling.

Karl Deutsch et al. (1977) presents a variety of world modeling studies produced by the Committee on Quantitative and Mathematical Approaches to Politics within the International Political Science Association (IPSA). Bremer, a contributor to Deutsch et al., also published a book on *Simulated Worlds* (1977) that is a model for national decision making in response to the international environment and national goals. Bremer also edited the reports from the GLOBUS project, a major attempt to simulate political and economic developments worldwide (Bremer ed. 1987). Among other contributions to the field of social science simulations we find Cusack (1987) and Smith (1987) on international political processes. Deutsch expresses great optimism in his foreword, announcing the project as "GLOBUS—The rise of a new field of political science". But after these grand efforts, world modeling has failed to attain the prominent position in political science Deutsch had hoped for (Deutsch 1990).

Nowadays, agent-based and game theory simulations are perhaps the best known examples of simulations in political and social science (see Axelrod 1984, Cederman 1977, 2003, Cioffi-Revilla 2002). In the present study, however, the system dynamics simulation technique is used for the analysis of flows derived from empirical time series data. Both system dynamics and

other simulation techniques continue to be employed for other purposes. Among them is the logical-systemic analysis of conceptual constructs, as in Cusack and Stoll's *Exploring Realpolitik* (1990), in which the assumptions and propositions of the realist tradition are probed by means of computer simulation.

[3] Mathematically, the stocks are integrals of the flows, and the derivatives of the stocks are the flows.

[4] The question Modelski & Perry address in their valuable study (2002) is whether the growth in the number of democracies in the world system follows a regular pattern; and, more specifically, whether that pattern is in accord with the Fischer-Pry substitution model of technological change. Modelski & Perry define democracy as a "fundamental social innovation, a new form of social organization, indeed a superior technology of cooperation in large-scale societies" (2002: 360). They argue that democracy evolves both by mechanisms of experimentation and through internal learning, and their investigation focuses on the quantitative diffusion of democratic communities in the world. They ask whether this diffusion describes a pattern of regularity in accordance with the Fischer-Pry equation, thus conforming to one of the models of innovation-diffusion. They answer in the affirmative. They go on to assume that the process of democratization in the world system proceeds as the diffusion of an innovation or a cluster of innovations. The same authors then ask whether democratization, i.e., the diffusion of democratic innovations, is in fact also a learning process. If so, they argue, it should be characterized by logistics (a curve representing a function involving an exponential, but also a limitation factor, shaped like the letter S). This is common to the diffusion of innovation in general, as described, for example, by Rogers (1995), and applied in the present article as well.

Modelski and Perry continue to ask whether one specific model of diffusion and technological substitution, the Fischer-Pry model, is useful for understanding the shape of the curve of horizontal democratization on a world scale. The Fischer-Pry model is expressed as follows (see Modelski & Perry 2002):

$$F / (1-F) = \exp[2\alpha (t-t_0)]$$

where *F* represents the fraction of substitution (in this case the 'fraction democratic' or the percentage of world *population* [my emphasis] living in democracies), and 1 stands for the size of the 'market', i.e., the world population. The slope of the curve is 2α, with t standing for time, and t_0 for the midpoint of the process, that is, when half of the world's population lives under democracy. A plot on the semi log (ln) scale of $F / (1-F)$ as a function of time then allows for a linear regression. Modelski & Perry's results indicate that a 10% saturation of democracy in the world was reached in 1885; that the midpoint (or 50% flex point) occurred in 1999; and that 90% saturation will be achieved around the year 2113. The share of explained variance in ln $F / (1-F)$, namely R^2, is then as high as .95 in their analysis (2002).

Modelski & Perry then argue that, since the cumulative world population living in democratic communities can be described in terms of such a logistic S-shaped distribution (which, in a semi-logarithmic scale, would appear as a straight line,) then the democratization of states in the world system can, in fact, be argued to be a social learning process that is identical to a process of democratic innovation and diffusion. Therefore, such social learning and diffusion models generally also produce the same type of distribution. However, looking at their data, the patterns of diffusion of democracy among fractions of *populations* in their analysis (and among

democratic *regimes* in the present analysis) are very similar. The regression line produced by using frequencies of democratic regimes, rather than the fraction democratic of world populations, has an even better fit (an $R^2 = 0.93$ rather than 'only' 0.91). Polities seem to follow a log-linear pattern somewhat closer to the learning assumption than does the fraction democratic of populations, even though the difference is miniscule. We may conclude that democratization may best be studied at the polity, rather than the population, level. As mentioned above this line based on the fraction democratic of the world's population has a fit reaching $R^2 = .91$. Modelski & Perry state that the value of $R^2 = .952$, but this is actually the R value itself, giving us 'only' $R^2 = .9077$ (i.e., .91). All other factors and equations are correct in their presentation. The comparison between population and polity level regression leads to the conclusion that diffusion of democracy on an aggregate international level is easier to predict than learning or diffusion of democracy at the national (as opposed to the population) level. It can also be argued that learning equals diffusion of knowledge—in this case, ways to institutionalize democracy.

[5] Diamond supports this analysis in an insightful study (2003).

[6] This appears in Nye's classic work (2003) as follows:

A country may achieve its preferred outcomes in world politics because other countries want to emulate it or have agreed to a system that produces such effects. In this sense, it is just as important to set the agenda and structure situations in world politics, as it is to get others to change in particular situations. This aspect of power—that is, getting others to want what you want—might be called attractive, or *soft power* behavior.

One may say that while hard power may lead the horse to water, soft power makes the horse drink. In *Soft Power* (2004: 7), Nye argues that this power, or the "ability to shape what others

want", can rest on the attractiveness of one's culture and values or the ability to manipulate the agenda of political choices in a manner that makes others fail to express certain preferences because they seem too unrealistic.

Power—hard or soft—is notoriously difficult to measure and analyze in quantitative terms (Dahl 1957, Bachrach & Baratz 1962, 1963, Lukes 1974, Nye 2003, 2004). In the present study, however, the problem of power (soft power in particular) is addressed through a system dynamics model of diffusion of innovation created by Bass (1969).

It should be emphasized that world system approaches to democracy diffusion are not inimical to national level comparative studies. Just as epidemiology does not contradict immunology, global diffusion studies do not contradict comparative political studies. The former focuses on why an epidemic is successful, while the question for the later is what factors make a country particularly susceptible to the epidemic. In this sense, world systems analyses, including those of Wallerstein (2004) and others such as Chase Dunn & Hall (1997) and Turchin (2003) detect different phenomena at different levels of analysis, just as this study is focused on aggregate or world systemic behavior.

[7] For a discussion of democracy theories and measurement, see Åberg & Sandberg (2003).

[8] The present homepage of the Polity Project is:

http://www.systemicpeace.org/polity/polity4.htm

[9] The institutionalized democracy indicator concludes that in 1800 there was one institutionalized democracy in the world system of polities, the USA, with the score of 7. The next institutionalized democracy to appear is Peru in 1828, with a score of 6 (reflecting the liberal constitution adopted in that year). The third institutionalized democracy using this indicator is the

United Kingdom in 1837, with a score of 6 (probably in consequence of the transformation of the sovereign to a ceremonial role when Victoria ascended the throne). From 1847 to 1854, Liberia, France, Switzerland, and Belgium reach 6 or more on the institutionalized democracy scale. In Liberia's case, this reflects the adoption of a constitution emulating that of the United States by the oldest independent state in Africa. For France, male suffrage and political reform were the result of the uprising of 1848. The same year marks the inception of political stability in Switzerland, and by 1853 the Belgian regime is considered to be institutionally democratized. In 1854, under the so-called Bloemfontein Convention, local Boer settlers formed the independent Orange Free State. The political structure of this new state combined traditional Boer institutions with Dutch and American constitutional theory. After becoming a self-governed crown colony in 1857, New Zealand was considered an institutionalized democracy. In 1864, the liberal Venizélos in Greece, after a landslide victory in the elections, instituted a wide-ranging program of constitutional reform for political modernization. At a conference in Quebec, Canada, in 1864, an agreement was reached on a general federal union. This marks the inaugural year of democracy in Canada. In the same year, Mosquera, who had once ruled Columbia as a dictator, received another two-year term as president under that country's new liberal constitution. Other examples might be cited. These countries are the early pioneers of institutionalized democracy, as defined in Table 1 and listed in Appendix 1.

[10] This is certainly so if collinear variables are involved. Let us say that the number of democracies in the world were included in a vector autoregression analysis, together with explanatory factors like the number of non-democracies, the number of newly-emerging democracies and non-democracies, as well as disappearing democracies and non-democracies, and the total number of states in the world. In that case the multicolliary would be 1. This would

be the same as explaining the individuals in a community on the basis of numbers of births, deaths, emigrants, and immigrants. Mathematically, fully-determined stock and flow systems cannot be analysed using statistical techniques because full determination leaves no room for probabilities. Thus, the present article is a test of the scientific validity of constructing such a deterministic model—a simplified, artificial system.

[11] Vensim and I-think are two other system dynamics simulation tools, the latter designed for Mac.

[12] *The Analogy with the Bass Model with Discards:*

One of the techniques that can help political scientists use systems analyses is the system dynamics approach. In its thinking and in the application of simulation tools from this perspective, innovation diffusion has been modeled in a variety of ways—perhaps most notably as 'Bass models' with their variations. The inventor of these models, Frank Bass, a marketing professor at the University of Texas at Dallas, originally published his model in *Management Science* in 1969. Some of the largest U.S. corporations have used the Bass model, and many business schools have applied it to diffusion studies of technical and social innovations, such as the diffusion of educational ideas, VCRs, color TV, PCs, answering machines, overhead projectors, and similar items (Rogers 1995 and the Frank M. Bass homepage). Extensions of the model have also been made into studies of successive generation technologies (Norton & Bass 1987). However, there is no indication that the diffusion of the Bass model (2004) has reached the realm of democratization analysis until now.

What is, then, the Bass model in its system dynamics form (Sterman 2000)? It assumes that two fundamental forces or communication channels (marketing on the one hand and interpersonal word-of-mouth on the other) influence potential adopters of an innovation (see

figure below). Individual adoption of new products as a result of marketing or advertising occurs continually throughout the diffusion process, but is concentrated in the relatively early stages of diffusion. Individuals adopting innovations as a result of interpersonal messages about the product (i.e., as an effect of its 'soft power') expand in number during the first half of the diffusion process and decline thereafter creating the typical logistic, S-shaped diffusion curve. One unique contribution of the Bass model is that it is predictive, providing a formula for estimating the rate of adoption in advance (Rogers 1995).

In our analysis we use Sterman's Bass model with discards (2000), since it provides an analogy with democracy as innovation (as we will see in detail below), and includes discards as an analogy with reversals into non-democratic institutions, thus providing for potential adoptions of new versions of democracy.

In system dynamics simulations, change is analyzed in terms of (a) flows between states or conditions, and (b) factors affecting those flows, whether they are variables or constants. In diagrams of models and their behavior, flows are depicted as pipes, and states and conditions as boxes. Flows are affected or regulated by means of 'valves' that are dynamically or statically determined by variables (circles) or constants (diamonds). The system dynamics models are totally determined mathematically and yield dynamics in numbers of units in a specific state at a given point in time. The model itself, however, remains unchanged during the simulation, in contrast to evolutionary and agent-based simulation models (see Gilbert & Troitzsch 1999).

[Figure 11 about here]

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The Bass model with discards (or 'BassDisc' model) in the figure above displays the analogy between diffusion of innovations and diffusion of democracy. In this model, there is a flow from potential adopters to actual adopters of an innovation (in our case, the regime innovation 'democracy' among potential adopter nations). This flow is driven both by advertising (democratic propaganda) and word-of-mouth (communicated experiences of democracy). The BassDisc model has a reversal discard rate that, in this analogy, indicates the reversal of democracy among states back into non-democracy. Each of the flows and their determinants require detailed scrutiny as valid parts of an analogy with democracy diffusion in the world. However, this first model lacks the in- and out-flows of potential adopters (non-democracies) and actual adopters (democracies) and is simplified on the assumption of a constant number of actors in the system.

Therefore, defined in the form of an equation, the adoption (of democracy) rate could simply be expressed as:

AdoptionRate = AdoptionFromAdvertising + AdoptionFromWord-of-Mouth

The analogy: Each year, the number of polities reaching a value of at least 6 on the 'institutionalized democracy' variable in the Polity IV data set equals the number reaching this value as an effect of 'marketing' or 'advertising' of democratic ideas in non-democracies (such as by parties and politicians from both non-democracies and democracies), plus the number reaching this value as an effect of transition resulting from word-of-mouth reports about democracies, i.e., positive communicated experiences or 'the soft power' of democracy. The equation for the later analogical democracy diffusion model is:

TransitionToDemocracySim = TransitionFromDemocraticIdeas +

TransitionFromSoftPowerOfDemocracy

In this first equation, the sum of transitions to democracy as a rate of polities transformed per time unit equals the sum of transitions resulting from propaganda disseminated by political actors in non-democracies and democracies, plus those transitions resulting from the soft power of democracy.

In the first place, there might appear to be fundamental differences between the BassDisc model and a democracy diffusion model: 'advertising' of a product for sale in a market is not a concept normally used in the analysis of the spread of democracy. However, looking closer at the mechanism from the perspective of the proposed analogy, it seems apparent that spokespersons of democratic parties 'advertise' democracy (or a particular type of democracy) in books, articles, speeches, party propaganda, statements, policies, and diplomacy. In recent decades, as mass media has become increasingly globalized, the ability of democratic governments to effectively pursue their policies is intrinsically linked to their ability to get across their message in mass media, notably TV channels such as CNN. The impact of this type of political campaigning may differ. Thus, in analogy with the BassDisc model:

*AdoptionFromAdvertising = PotentialAdopters * AdvertisingEffectivessness*

The analogy: The yearly number of non-democracies adopting democracy attributable to the political 'advertising' of democratic ideas in non-democracies equals the product of the

number of non-democracies and the effectiveness with which positive messages are communicated. The analogous equation may be formulated as:

*TransFromDemIdeas = NondemocraciesSim * CommunicationEffectivessness*

Thus, the rate of adoption of democracy as projected by this model is the result of political 'advertising' of democratic ideas and ideals by democracies themselves. This political 'advertising' in the global marketplace of democracies may be more or less effective, and in the BassDisc model above, the effectiveness is assumed to be constant (although this, too, can be modified in a democratization model). In the lower diagram of the figure above, one can see that adoption from advertising is important in the initial diffusion phase, while adoption from word-of-mouth subsequently grows very rapidly until the system's carrying capacity of potential adopters is reached.

The adoption rate, on the other hand, is determined analytically by the sum of two other functions: the loops of 'word-of-mouth' and market saturation. In the market-driven Bass model, the adoption from word-of-mouth is the most important in the long run (see the figure's lower diagram, curve 1). At first, adoptions from word-of-mouth (due to the attractiveness or soft power of the innovation) are zero and thus lower than adoption from advertising. However, as the number of adopters grows, the adoption from word-of-mouth accelerates. The reason for this may be seen in the following equation:

*AdoptionFromWord-of-Mouth = Adopters * PotentialAdopters * ContactRate **
AdoptionFraction / TotalPopulation

The Analogy: The number of adoptions of democracy each year among states in the world system equals the number of democracies times the number of non-democracies times the rate by which contacts are made between non-democracies and democracies (communicating positive experiences of democracy) and the fraction of those states that become democracies as a result of that contact, divided by the number of states in the world system that year. The equation becomes:

TransFromSoftPowerOfDem = DemocraciesSim * NondemocraciesSim * CommunicationRate * TransitionFraction / TotalNoOfStatesSim

Though this is not a definition of soft power, it is an equation that defines the factors that produce transitions to democracy from soft power. Soft power is driven by (a) the communication rate (communications per unit of time) between potential adopters and actual adopters, and (b) the fraction of times (percentages of the contacts) such interactions result in adoption per population unit. In the first model, these two factors are defined as constants; however, they will play important roles in the further elaboration of the model.

The soft power or word-of-mouth effect is small if the number of democracies or non-democracies is small, but grows in importance as the number of adopters relative to the number of potential adopters is close, since the product of the two is largest when they are equal. When the number of potential and actual adopters are equal (i.e., when curves 1 and 2 cross each other in the upper diagram in the figure), the soft power or adoption from word-of-mouth is strong, as it is close to its peak. As soon as there are more adopters—thus less potential

adopters—the product of the two decreases. This is why the loop reinforces itself at first, but flattens out towards the end: the more adopters of democracy, the more additional adoptions, but decreasingly so when democracy approaches the carrying capacity of the world system of states. Therefore, as will be noticed in the analysis below, the soft power of democracy is extremely strong around the time the number of democracies is close to or equals the number of non-democracies (something that occurred in the year 1991, since in 1992 the number of democracies was 78, which is 11 more than the non-democracies).

Finally, the discard rate in the BassDisc model is determined by the average 'product lifetime', which in our case is the average lifetime of a type of democratic regime. It can be described as:

$$DiscardRate = Adopters / AverageProductLife$$

The analogy: The number of democracies abandoning democracy each year equals the number of democracies at the time divided by the average lifetime of democracies for that year. The equation would appear in analogy as:

$$ReversalsFromDemRates = DemocraciesSim / AverageDemLife$$

However, since the model is based on real data, the 'discard rate' would be here defined as the values of actual Polity IVd data on reversals from democracy to non-democracy each year (see Appendix 1 and 3).

The equation above can be understood as the reversal rate from democracy to non-democracy. In this case it is described mathematically, rather than analytically. The equation does not actually explain the discard rate; it defines it. The discard or reversal from democracy rate is simply determined mathematically by two factors, namely, how many adopters of democracy there are divided by the average product lifetime each year (in this case, the longevity of democracy). The more democracies there are and the shorter their life spans, the higher the discard (reversal) rate. This flow will not be simulated in the present article, since the actual data on reversals can be extracted from the Polity IVd data set (see Appendix 1 and how it is incorporated in the equations in Appendix 3). It may be noted that the average lifetime will probably not increase in the younger democracies, due to the fact that the first democratizers were those with the most favorable conditions for democracy at the time of its adoption, while later democratizers may often lack the solid preconditions the pioneers had.

It is also useful to note the analogy between the Bass model and the so-called SIR models in epidemiology. SIR is an acronym for Susceptible, Infected, and Recovered. 'Susceptible' signifies the potential adopters, 'infected' the adopters, and 'recovered' those who discard the innovation. We see that the global diffusion of democracy can be likened to a global 'epidemic' in which non-democracies are 'susceptible' to democracy, democracies are 'infected', and those countries that have abandoned democracy are 'recovered' (see Åberg & Sandberg 2003, chap. 1, on the theory of institutional evolution). The same mathematical calculations would apply. The reason epidemics and the diffusion of technological and social innovations exhibit similar patterns remains a challenge for the natural and social sciences to explain.

[13] The mathematical definition of the simulation of number of democracies is therefore (see Appendix 3):

init   Democracies = InitNoDem

flow   Democracies = + dt * EntryDem – dt * ExitDem – dt * ReveralslFromDemRate

                       + dt * TransToDemRate

The initial value (init) of the simulated number of democracies (DemocraciesSim) equals 1 (namely, the US), and the number equals the differential of births of democracies, minus the differential of deaths of democracies, minus the differential of reversals from democracies, plus the differential of transitions to democracies.

[14] Theoretically, this would mean that the experience of democracy is communicated to all non-democracies on an average of 1.5 times a year, but that in only 1.5% of those instances do non-democracies actually become democracies. Thus, the experience of success in one country may in very few cases trigger democratization in another.