Why Waves? Global Patterns of Democratization, 1820–2008 *

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Summary

Using a more refined measure of democracy and of political system change we find substantial support for Samuel Huntington's (1991) thesis of democratic waves. Democratic transitions do tend to cluster. After demonstrating that political transitions follow a global wave pattern, we explain why they occur in waves. Reformulating and expanding Huntington's thesis, we hypothesize that a combination of the 'stickiness' of certain institutional configurations, the influence of neighboring countries, and shocks to the interstate system such as the world wars are the main explanation of waves, in combination with the slow but certain impact of economic development. Using multinomial logit analyses of political transitions, we find considerable support for these hypotheses.

12,150 words, excluding Tables 2, A-1, and A-2.

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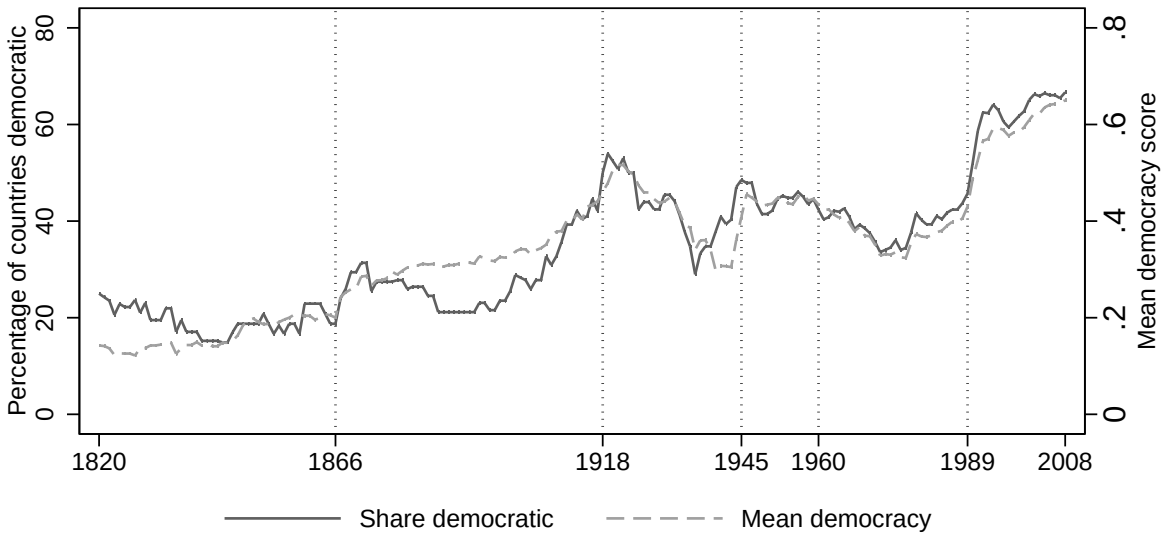
1 Introduction

Democratic transitions tend to occur together in space and time. Witness the recent demise of Zine El Abidine Ben Ali, Hosni Mubarak, and Muammar al-Gaddafi, and the subsequent intense pressure on other authoritarian leaders in the Middle East/North Africa region. Samuel Huntington, observing many years earlier similar clustering of events, described the pattern of global democratization as a series of three waves and reverse waves. Huntington (1991, 15) defined a wave of democratization as:

> a group of transitions from nondemocratic to democratic regimes that occur within a specified period of time and that significantly outnumber transitions in the opposite direction during that period of time. A wave also usually involves liberalization or partial democratization in political systems that do not become fully democratic.

Huntington's analysis of waves of democratization was based on measuring the proportion of democratic regimes over time, as represented in the solid line in Figure 1. The first wave of democratization started in the early 19th century and persisted until the 1920s, after which many democracies reverted back to autocracy (i.e., the first reverse wave). With the end of World War Two came a second wave of democratization. This wave was relatively brief, with a large proportion of countries succumbing to autocracy in the 1950s and thereby composing the second reverse wave of democratization. In the mid-1970s the third wave of democratization began, continuing in force through the 1990s and 2000s with the end of the Cold War.

Figure 1: The evolving democraticness of the world, 1820–2008



Democratic share: Countries are defined as democratic if they score 0.6 or higher at the SIP democracy index (Gates et al., 2006). Mean democracy: Global mean for the SIP index.

Although the notion of waves is widely accepted, their existence is contested by scholars such as Przeworski et al. (2000) and Doorenspleet (2000*b*). In Section 2, we review the debate on the existence of waves and present data to support Huntington in that a wave structure indeed exists. But why do democratic waves occur? Huntington (1991, 31–34) identifies four classes of explanations for waves of democratization.

Perhaps the most obvious source of clustered changes is covered by Huntington's 'parallel development' explanation (p. 32) – clustered changes in factors that 'cause' democracy, such as socio-economic development. Internal factors, however, rarely change sufficiently rapidly to give rise to waves. Another class of explanations are referred to as 'snowballing' (Huntington, 1991, 33). Democratization in a country often spills over into neighboring countries, as domestic oppositions gain confidence or obtain resources to put effective pressure on their own elites, and experience from transitions in the neighborhood lead political actors to revise their calculations concerning which institutions best serve their interests. The powerful effects of changes in the neighborhood has been demonstrated in work such as O'Loughlin et al. (1998), Wejnert (2005), Gleditsch and Ward (2006) and Simmons, Dobbin and Garrett (2008). Relatedly, 'prevailing nostrum' explanations feature the more faddish aspects of political reform, whereby political actors tend to agree that certain institutional reforms are 'the solution' even when facing widely differing immediate pressures to reform. 'Single causes' such as the end of the Cold War constitute Huntington's final class of explanations.

Below, we review these arguments and the evidence for them in more detail. We operationalize aspects of 'parallel development' and 'snowballing' in detail and assess their explanatory powers. We expand Huntington's account by linking these mechanisms to a notion of 'institutional equilibrium', and show that this link gives a considerably better understanding of democratic waves. Huntington builds his argument on a dichotomous conception of democracy, and his account of what stabilizes democracy only accounts for non-institutional factors such as the size of the middle class or influence by other powers (as do Przeworski et al., 2000). Studies following Gurr (1974), however, indicate that gradual democratizations also introduce institutional tensions that add to the propensity for wave-like behavior. In addition, the 'stickiness' of self-reinforcing institutional configurations is a source of wave behavior not covered by Huntington.

Finally, we expand considerably on the external factors that Huntington (1991, 31–32) mentions under the 'single-cause' heading. These might be swift changes in global norms toward democracy or a change in the attitudes or global influence of a superpower. The article looks into how large interstate wars, global shifts in alliance structures, and the creation of new states have contributed to the three waves of democratization over the last 200 years.

2 Are there democratic waves?

Despite widespread acceptance of the wave analogy,[1] several authors have questioned Huntington's conclusion that there have been three waves of democratization. The first body of critiques is conceptual, focusing on the definition of democracy employed by Huntington. The second is empirical, focusing on Huntington's measure of the incidence of transitions to democracy in terms of the percentage of states globally. We address these two criticisms by showing how previous analyses (by both Huntington and his critics) are methodologically problematic, and by demonstrating that distinct waves of democratization are evident across a variety of empirical assessments of democratic transitions. Indeed, we conclude that there is strong evidence supporting the notion of democratic waves.

2.1 Definition of democracy

The first criticism of Huntington (1991) regards his definition of democracy. Huntington's definition is derived from Dahl (1971)'s classic definition of democracy, which focused on the concepts of contestation and participation. Huntington's coding of democracy is based on the level or extent of open, free and fair elections; limitations on political power; institutionalization and stability; and electoral competition and widespread voting participation (Huntington, 1991, 7–13). Moreover, regarding 'the issue of whether to treat democracy and nondemocracy as a dichotomous or continuous variable,' Huntington (1991, 11) employs a dichotomous classification.

Doorenspleet (2000*b*, 384–406) criticizes Huntington's operationalization of democracy. She argues that Huntington fails to incorporate a dimension of inclusiveness in his measure, and proposes a remedy partially based on participation figures. Her 'minimal democracy' measure, is dichotomous and based on the concepts of participation and competition. In order to qualify for the democracy label, a country must grant participatory rights to at least 80% of the total population and meet a series of institutional criteria related to political competition. This measure is stricter than Huntington's original measure, and its use results in fewer countries being coded as democracy in the early periods.

Przeworski et al. (2000, 36–50) also employ a dichotomous definition of democracy based on whether or not the executive and members of the legislature obtained office via at least semi-competitive multi-party elections.[2] This definition is less strict than that used by Huntington, so Przeworski et al. code more countries as democratic than does Huntington. By the same token, the bar for *maintaining* democratic status is much lower according to the Przeworski et al. definition than to Huntington's. Consequently, Przeworski et al.

[1] See for example Jaggers and Gurr (1995) and Diamond (2001).

[2] A caveat to the Przeworski et al. (2000, 29) definition is that a country can satisfy the conditions of at least semicompetitive multi-party elections and still not be coded as democratic if there has been no alternation in power during the period analyzed. For a critique of this questionable coding rule see Gleditsch (2002*a*).

are less likely to code a country as switching from democracy to autocracy. It is possible that the different conclusions these three studies reach regarding waves is due to the different definitions employed.

2.2 Empirical issues

Both Doorenspleet (2000*b*) and Przeworski et al. (2000, 36–50) argue against the notion of waves. Both criticize Huntington for classifying waves using a measure based on the percentage of states that were democratic over time. The problem with this measure is that the number of states in the global system increased dramatically during Huntington's analysis period. Przeworski et al. find that transitions between democracies and autocracies in the 1950–1990 period occur mostly in Latin America, and that the rest of the world was relatively stable during this period. Focusing on transitions rather than fractions of democracies, the authors find no clear wave structure. They conclude that transitions occurred both to and from democracies between 1950 and 1990, with a monotonic increase in favor of democracies during the period.

Doorenspleet argues along the lines of Przeworski et al. (2000) and focuses on transitions in order to remedy the effect of the different number of observations over time. Weighting transitions by the size of the international system, she finds three periods of growth, but no reverse trends. She concludes that further research 'should be careful in comparing and explaining different waves of democratization. ... [F]uture studies in which reverse waves are compared will be useless, because there are no reverse waves' (Doorenspleet, 2000*b*, 400).

In sum, the case made by Doorenspleet and Przeworski et al. is that there are no waves, only Huntington's misconception of democracy and problems with his methodology. Nonetheless, both Doorenspleet and Przeworski et al. base their analysis on dichotomous definitions of democracy that are simply too blunt to be able to adequately assess transitions from one type of regime to another, and hence to be of much use for understanding the refined concept of democratic and autocratic transitions.

2.3 Waves assessed in small steps

Binary distinctions between democracy and non-democracy are sensitive to where one makes the cut. This is particularly problematic when evaluating regime transitions. With a dichotomous measure of democracy, only one kind of political transition can be evaluated – the shift from non-democracy to democracy or vice-versa. A continuous index of democracy is better suited, since all types of political transitions can be evaluated and the magnitude of a transition can be assessed. Such a methodology allows us to better understand the nature of political transitions and how they relate to the patterns of global democratization.

The SIP index (Gates et al., 2006) condenses a three-dimensional conceptualization of democracy to one

dimension.[3] The SIP is the average of the three (normalized) components of the three-dimensional indicator. The entire scale of the index ranges from 0 (a perfect autocracy) to 1 (a perfect democracy). The dotted line in Figure 1 shows the average SIP index in the system for the 1810–2008 period.

In one dimension, three possible transitions are possible: A transition toward democracy, a transition toward autocracy, or no change.[4] We model changes as small as 0.03 on our unit-scale democracy index; a change of 0.03 is small, but not inconsequential.[5] For example, we record a transition towards democracy in Rwanda in 1994. Following the genocide and subsequent rebel military victory, Polity records a slight increase in 'executive constraints', from 1 to 2. The other dimensions remain at their most autocratic level. The size of this change in our SIP index is 0.056. The 'Rose Revolution' of Georgia in 2003 resulted in a net democratic transition, but not all dimensions improved. The outgoing regime headed by Eduard Shevardnadze had a low value on the executive recruitment scale, but a fairly high value on the participation scale, as no party held a legislative majority. The incoming regime was coded as more democratic on the recruitment scale, but both presidential and legislative elections were totally dominated by Saakashvili and his National Movement – Democrats. These elections were therefore coded as less competitive than their precursors, and thereby reducing the net change significantly. In the end, the increase on our SIP index was 0.045.

What might seem like minute changes in the SIP index, then, do indeed correspond to real changes in the political realities. The cut-off point of 0.03 is as such arbitrary, but we find no examples of nonsensical transitions produced by this low threshold in our dataset. We show below that such small changes sum up to a pattern very close to Huntington's waves, and that our statistical results are robust to changing this definition.

Modeling the entire transition matrix between the 33 intervals formed by subdividing the index into similar-size segments would be infeasible. Nor is it necessary. Our interest lies mainly in whether there was democratization, autocratization, or no change. We model this as two types of transitions: we code an observation as a democratization if the SIP score at time t is at least 0.03 higher than the SIP score at $t-1$. Likewise, we code an autocratization if the score is at least 0.03 lower than the year before. In any other case, we code the observation as no change. In supplementary analyses, we look at changes of at least 0.10 and 0.20 along the SIP scale.[6]

Table 1 summarizes the number of transitions given the three change thresholds we use – 0.03, 0.10, and

[3]The index combines aspects of the Polity (Jaggers and Gurr, 1995) and Polyarchy (Vanhanen, 2000) by integrating a weighted measurement of political participation from Polyarchy with the Polity measures of executive constraints and executive recruitment.

[4]Modeling the 27 possible transitions in three dimensions would be interesting, but hard to interpret and would run into problems with sparse data.

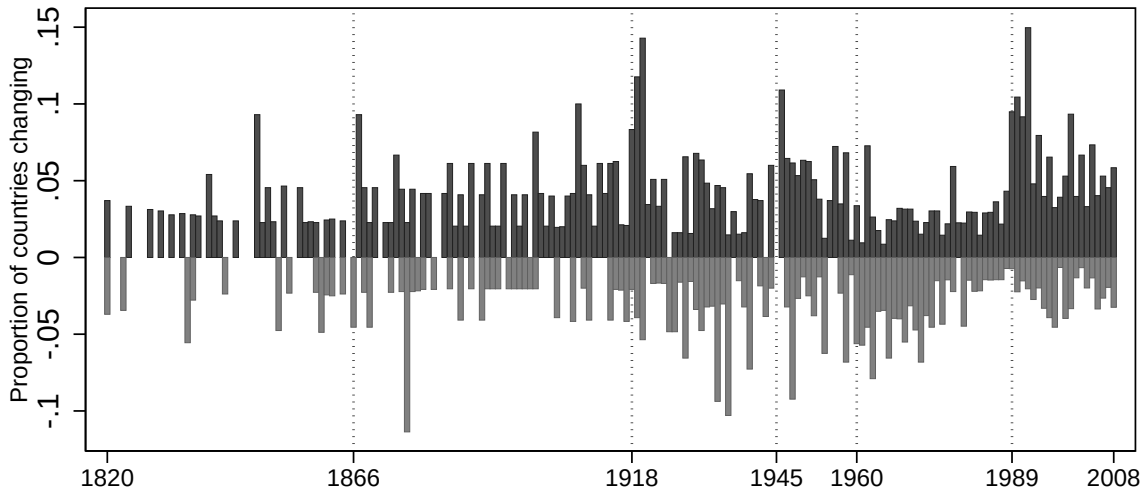
[5]The change corresponds roughly to a one-unit change in Polity's democracy index, or to a 3% increase in the proportion of a country's population entitled to vote.

[6]These are reported in the Appendix.

Table 1: Democratization vs. Autocratization, 1820-2008

Definition	0.03		0.10		0.20	
Polity Change	frequency	percent	frequency	percent	frequency	percent
Autocratization	254	2.52	207	2.05	127	1.26
No change	9430	93.58	9574	95.01	9796	97.21
Democratization	393	3.90	296	2.94	154	1.53
Total	10077	100.00	10077	100.00	10077	100.00

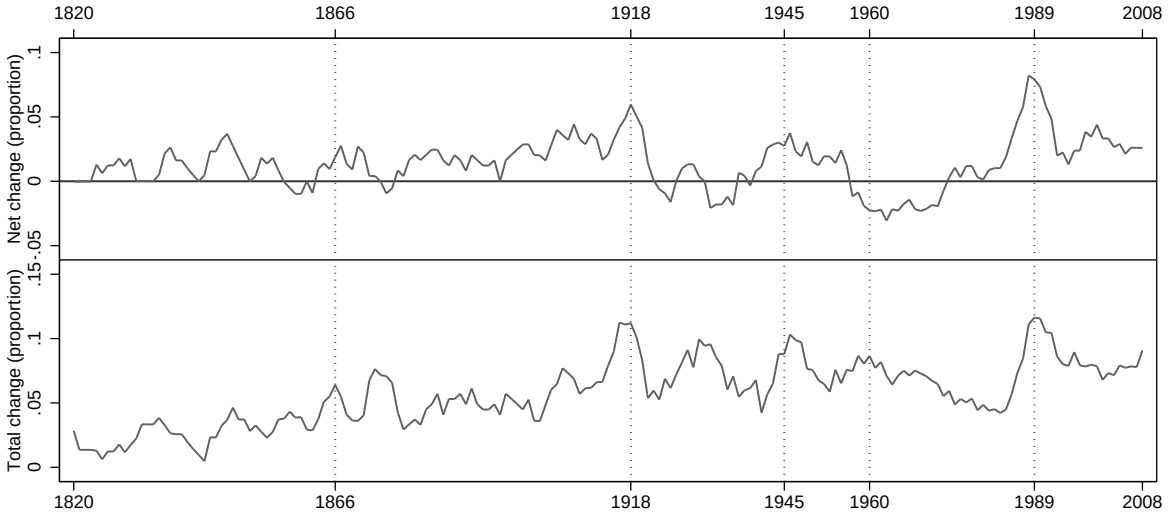
Figure 2: Proportion of countries with change toward democracy (positive; ΔD) or toward autocracy (negative; ΔA), by year, 1820–2008



0.20. Using the most inclusive definition, there were between 1820 and 2008 393 incidents of democratization for which we have data for all explanatory variables. This constitutes about 4% of all country years in the system. Fewer cases of autocratization occurred, 254 all in all. 93.6% of the country years involve no political transition. In total we have data for 10,077 country years in the international system over these two centuries.

With our more finely-tuned measure and the extended period of analysis, we can trace the changes that escaped the detection of Doorenspleet and Przeworski et al. Figure 2 portrays all political changes along our SIP scale. We count the number of political transitions toward democracy and the number of changes toward autocracy for each year. We then divide the two counts by the number of countries in the world. The proportion of the countries in the world with changes toward democracy are shown above the 0 line at the y axis. Those toward autocracy are shown below 0. This figure shows how the number of transitions in both directions follows a pattern of parallel waves. The first wave grew gradually in size during the 1800s, reaching a peak following the end of World War One. With the initiation of the Great Depression in 1929, and the rise of Fascism and Communism in Europe, a reverse wave began that would only retreat with the end of World War Two. The second wave of democratization starting in 1936 was relatively brief, and by the late 1950s a

Figure 3: Upper panel: Net proportion of countries with change toward democracy or autocracy ($\Delta D - \Delta A$). Lower panel: Proportion of countries with change in either direction ($\Delta D + \Delta A$). Five-year moving averages, by year, 1820–2008



second reverse wave began. The third wave of democracy began in the late 1970s and experienced a sharp rise with the end of the Cold War. In the years immediately after 1918, 1945, and 1989 (all marked with vertical lines in the figure), a large number of countries changed toward democracy. Reverse waves occured before 1939, in the 1960s, and in the 1990s.

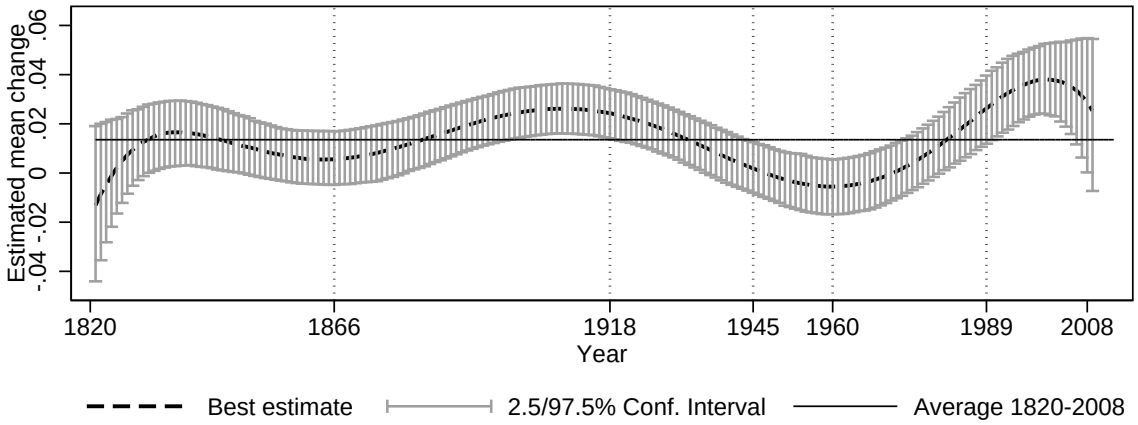
The wave pattern is even clearer in Figure 3. In the upper panel, we subtract the number of transitions toward autocracy from the number of transitions toward democracy to obtain a measure of net change.[7] Democratic waves are seen in periods where the average net change is larger than zero, and reverse waves in periods where the average net change is negative. Just as argued by Huntington (1991), the 19th century was a long democratic wave with net change toward democracy, ending about 1920. The 1940–1955 period as well as the post-1975 period were also democratic waves. The third wave is still going strong in 2008.

The reverse waves are as evident as the democratic ones. The 1920s and 1930s show a large number of autocratic transitions. While a number of democratic transitions occur throughout the 1955–1975 period (see Figure 2), they are outweighed by the number of autocratic transitions in this period. The figure also indicates two shorter reverse waves around 1860 and 1880.

The lower panel shows the proportion of countries with change in either direction. A striking trend is the steady increase in the annual proportion of countries with changes. The peaks of the democratic

[7] We have calculated the five-year moving average of the net change series to maximize readability.

Figure 4: Predicted net global political change, 1820–2008



waves happened in conjunction with periods of great volatility associated with the great wars (the German unification wars, the World Wars, and the end of the Cold War). The reverse wave in the 1930s was also a period with a large amount of changes. The last decade in our dataset has also seen a large relative number of changes. Although the third wave currently is weaker than during the years following the fall of the Soviet Union, Figure 3 shows that it remains stronger than in the 1975–1986 period.

Could these patterns occur by change? We test for this using a OLS model where the unit of observation is the year; the dependent variable is the net democratic change as in Figure 3 (top), and the explanatory variable is the number of years since 1810, raised to the power of 1, 2, 3, 4, 5, and 6. The regression coefficients are impossible to interpret by themselves, due to the massive collinearity inherently present. We use Clarify (Tomz et al. 2001) to predict the number of changes, and the 95% confidence interval surrounding this figure. We then compare this to the gross average for the whole period.

Figure 4 shows that the end of the first wave, the second reverse wave, and the third wave are clearly distinct from random fluctuations. The gross average is below the confidence interval of the two waves and above the confidence interval for the counter-wave. Net democratic change during the first reverse wave and the second wave may not be different from the gross average, statistically speaking. However, this may be because they are too brief to be captured by means of this test.

3 Why waves? An equilibrium model of institutional stability

There clearly are waves of democratization, but how can this be explained? We group our explanation into four general patterns. We review these in the following sections and list a set of implications for when and where changes toward democracy or autocracy should occur. These implications are formulated in terms of the probabilities that a country will experience an institutional change toward autocracy or democracy in a

given year. In the empirical analysis below, we test whether these implications hold. We then proceed to analyzing how the implications are likely to create wave patterns globally.

The first pattern is due to the implications of economic factors internal to countries. The second is democratic diffusion, where the neighborhood of a country exerts a forcefull pull on the setup of its political system, resulting in a clustering of changes in similar directions (section 3.2). The third pattern strongly contributing to the formation of waves is the 'stickiness' of consistent institutions 3.3. In contrast to the first two factors, this has largely been ignored. In our empirical analysis, we show that institutional consistency is very important for explaining waves. The fourth set of explanations also tend to be neglected – the systemic shocks to the global system created by world wars, global reorientations of alliances, and the waves of newly independent states.

3.1 Internal non-institutional factors: the 'economic' model

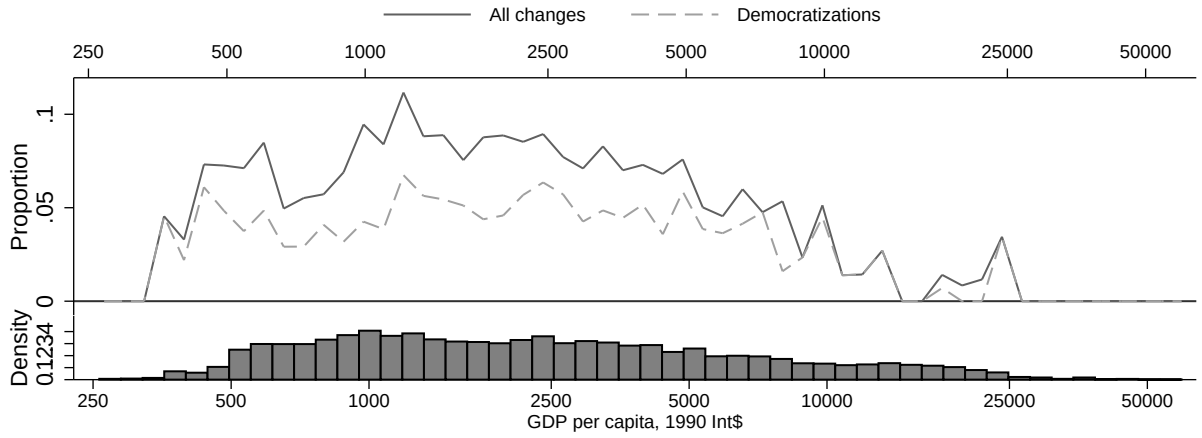
An explanation of waves and reverse waves is incomplete without a model of how democratization and autocratization occurs. First, we discuss two non-institutional factors that are prominent in the literature, related to Huntington's 'parallell development' explanations.

A vast literature demonstrates the strong relationship between socio-economic development and democratization (e.g. Lipset, 1959, Vanhanen, 1997, Przeworski et al., 2000). The relationship may be explained by mulitple mechanisms. Lipset (1959) argued that higher income and better education for 'the lower strata' would lead to more compromise-oriented view of politics, and to greater surpluses to distribute. Lipset (1959) and Dahl (1971) focus on the importance of a diversified economy with ample economic opportunities without direct access to political office. Boix (2003) and Acemoglu and Robinson (2000) highlight how economic development increases the relative share of assets that are difficult to appropriate by means of force, making it less costly for elites to allow for redistribution. Autocratic institutions are thus sustainable in low-income, natural resource dependent, illiterate societies; whereas democracy thrives in high-income countries dependent on skilled labor and financial capital.

Countries tend to transition from non-democracy to democracy as they transition from poor societies based on agriculture and natural resource extraction, to rich economies based on manufacturing and services. Figure 5 shows that countries with income levels between 1,000 and 5,000 dollars (levels typical for non-oil producing Middle-Eastern countries) are most likely to see changes to their political systems. Countries with incomes between 5,000 and 10,000 dollars are less likely to change, and most changes are in the direction of democratization. These regularities of change affect the wave pattern of global democratization.

These socio-economic factors have changed immensely in most parts of the world over the two centuries

Figure 5: Proportion of countries with change in either direction ($\Delta D + \Delta A$), by income level, 1816–2008



studied here. They all change gradually, however. Although development certainly is a major explanation of the long-term increase in democracy seen in Figure 1, it cannot in itself easily explain the tendency for democratization to cluster, except in the unlikely case that several countries simultaneously reaches a 'development threshold' over which democracy is sustainable.

Another regularity, however, points to how development can lead to wave patterns. All regimes, autocratic, democratic, and inconsistent ones, are considerably more stable when countries have solid economic growth (Gasiorowski, 1995, Przeworski et al., 2000, Gates et al., 2006). Global recessions may lead to clusters of regime changes in either direction. Sustained economic growth, on the other hand, simultaneously supports non-democratic and inconsistent regimes in the short run while steadily undermining the conditions that sustain non-democratic regimes in the long run.[8] This adds a new aspect to our model of stable constellations of institutions. Economic diversification increases the amount of non-institutional sources of political leverage for the opposition. Strikes and demonstrations are easier to organize and more costly in economies dependent on manufacturing or tourism than in those mainly based on agriculture or oil extraction.

Economic development, then, can gradually render non-democratic countries more and more 'ripe for revolution'. Democratic institutions tend to be unsustainable in low-income countries (Przeworski et al., 2000), and, to some degree, non-democratic institutions in high-income countries. Since economic development and economic crises often happens in parallel in neighboring countries, it is likely that regions become institutionally volatile in concert. The Middle East (at least the non-oil producing states) has reached such a state. Small sparks, then, have a potential to set a fire.

[8] Olson (1993) points to related mechanisms with similar long-term consequences.

At the country-year level of analysis, the pattern has the following implications:

Model 1 *Economic model*

1.1 *The probabilities of transitions toward democracy and of reversals toward autocracy are highest at middle levels of income*

1.2 *Economic growth decreases the probability of transitions*

Since economic development and growth are strongly clustered geographically and temporally, we expect these implications also to give rise to clusters of regime changes.

3.2 Democratic diffusion

Another of Huntington's explanations is 'snowballing' – non-democratic regimes in middle-income countries with a high underlying probability of democratization are sensitive to what happens in the immediate neighborhood as well as globally. Several studies find ample evidence for the importance of the political neighborhood (Gleditsch and Ward, 2000, Gleditsch, 2002*a*, Gleditsch and Ward, 2006). Kuran's (1989) argument also provides a partial explanation for snowballing – the ability to organize and to overcome collective action problems in Tunisia observed at the end of 2010 provided information on preferences also to the potential opposition in Egypt and Libya. Changes to political systems, then, depend on the situation and events in other countries, in particular in the immediate neighborhood. Assuming that autocratic elites in neighboring countries have joint interests in preserving the status quo, they are also likely to assist each other, just as a strong opposition movement may strengthen that of a neighboring country. In cases where the power balance between the incumbent and the opposition is already precarious, the shift in power due to changes in foreign support may be sufficient to tip the balance. Given this, autocratic systems should be more stable in autocratic neighborhoods, and vice versa.

Likewise, democracies (especially new democracies) are most likely to collapse when surrounded by autocracies. The biggest problem is that such autocracies may serve as a security threat. If a country is located in a region of warfare or a security threat, democratic institutions are compromised (Gates, Knutsen and Moses, 1996, Thompson, 1996). Examples of restricted freedom during wartime, e.g. martial law, demonstrate how democratization can be hindered by a security threat.

The expectation, then, is that political systems are less stable when surrounded by regimes different from themselves, and tend to change in the direction of the prevailing regime type in the neighborhood:

Model 2 *Diffusion model*

2.1 *The more a country differs from its political neighborhood, the more likely it is to experience a political transition.*

2.2 *States are more likely to have polity changes towards the average democracy value (SIP value) in its neighborhood.*

2.3 *Polity changes are likely to cascade: a regime change in one country is likely to be followed by a regime change in the same direction in a neighboring country.*

3.3 Internal institutional factors

Economic development and 'snowballing' are important sources of wave behavior. These sources, however, are reinforced by considerable variation in the 'stickiness' of different institutional combinations. Sticky institutional constellations tend to delay change in countries that otherwise have a high propensity to change.

Social, economic, and political institutions, especially those that have developed indigenously, will exhibit a fair degree of stickiness. Over time such institutions will develop self-enforcing mechanisms and serve vested interests. Landlords, priests, and chiefs have a stake in preserving the status quo and will tend to resist change. Evaluating and measuring all aspects of institutional stickiness is beyond the scope of this article, given our focus on patterns of political transition, we focus on political institutional stickiness.

There are at least three sources of stickiness in political institutions. The first relates to the inherent stability of certain constellations. Gurr (1974), Eckstein (1969; 1973), and Gates et al. (2006) demonstrate that 'consistent' political institutions – institutions that are either autocratic or democratic in all their constituent components – are much more stable than inconsistent institutions.[9] Autocracies and democracies exhibit consistent patterns of authority, where authority is concentrated in autocracies and dispersed in democracies. Polities with aspects of both concentrated and dispersed authority patterns provide institutional opportunities for political entrepreneurs to attempt to further concentrate or distribute power. In the language of evolutionary game theory, autocracy and democracy are institutions that reflect evolutionary stable strategies (ESS), while institutionally inconsistent polities are not. If the opposition attempts to change one single

[9]See Eckstein (1969; 1973). We focus on three authority dimensions, executive recruitment, executive constraints, and participation. Consistent democracies exhibit completely open executive recruitment patterns (associated with open free elections), constrained executives, and high levels of political participation. Consistent autocracies exhibit closed and limited (yet institutionalized) executive recruitment, no constraints on executive power, and no public political participation. Institutionally inconsistent regimes exhibit a mix of these authority patterns.

aspect of an autocratic political system in a democratic direction, the elites controlling the other components will have strong incentives and ample opportunities to prevent the reform. If a partial reform succeeds, they are in a strong position to reverse the reform after some time. To be reasonably certain to succeed in democratizing a consistently autocratic regime, the opposition must replace the incumbent with one elected in open, fair, and regulated elections as well as establishing effective systems of checks and balances to constrain the newly elected leader. In such situations, the external impetus for change must be exceedingly strong to produce a lasting effect.[10]

Another source of stickiness is the consolidation of institutions that develop over time – as incumbent elites and the opposition within a political system adapt to existing institutions, bolstering their power and acknowledge situations of stalemate, the constellation of components becomes more stable. Indeed, an inconsistent constellation of institutions that has remained unchanged over 20 years is more likely to be stable than one that was established the year before.

These expectations are summarized as follows:

Model 3 *Internal model*

3.1 *Inconsistent regimes are more likely to experience political transition*

3.2 *Inconsistent regimes are more likely to change toward the most proximate consistent regime type*

3.3 *A constellation of institutions becomes less likely to change the longer it exists*

3.4 Systemic shocks

The final group of explanations offered by Huntington (1991, 31–32) are grouped under the heading of 'single causes' – changes at the systemic level that suddenly change the balance of power between incumbent elites and opposition groups in a large number of countries simultaneously. The pattern of spikes observable during the 20th Century in Figure 2 indicates the big role played by international shocks. A spike of democratization occurs in the aftermath of World War One. Other spikes occur after World War Two and the end of the Cold War. The reverse waves peaked in the 1930s and the 1960s. It is clear from Figure 2 that changes toward democracy and autocracy, respectively, were more frequent in these years.

[10] A third source of stickiness elaborated by Kuran (1989) is due to a combination of collective action and coordination problems and incentives for preference falsification among the supporters of the opposition. Since the autocratic regime routinely punishes individuals issuing public statements of support for the opposition, individuals will refrain from revealing their preferences. Even in cases where a sufficient proportion of the population privately supports a revolution to make it feasible, it will not occur because they are not aware of how large this support is. In such a situation, the regime is very unstable without anybody knowing it. It will only take a spark such as the self-immolation of Mohammed Bouazizi in Tunisia to ignite the 'prairie fire' of revolution. Situations of extensive preference falsification, however, is by definition impossible to measure, and will not be considered here.

Wejnert (2005) model a similar set of 'historical events' as temporal dummy variables. To better understand waves of democratization, however, we need to operationalize variables that more accurately reflect the mechanisms behind these systemic shocks. Below, we relate them to three different, but related shock transmitters. The first is the impact of losses in war. The second is large systemic shifts in countries' alliance structures. The third is the simultaneous creation of a large number of new states. New states tend to be born as fledgling democracies but are liable to subsequent reversals.

3.4.1 Systemic war

War and system shock are important external factors for explaining why waves crest when they do. The top panel of Figure 6 shows the number of states that lost an interstate war, and are based on COW's Interstate War Dataset. The dataset encompasses wars that take place between or among states. Wars must involve sustained combat and cause a minimum of 1,000 battle-related fatalities within a twelve-month period (Sarkees and Wayman, 2010, 75). The 'war losses' graph in Figure 6 shows for each year the annual number of states losing a conflict divided on the number of states in the system.

As demonstrated by the analysis of the international system 1816–1992 in Mitchell, Gates and Hegre (1999), the dominant systemic effect of war is to increase democratization. They conclude that 'an increase in the proportion of nations fighting war in the international system will increase the proportion of democracies due in large part to the finding that non-democracies are more likely to experience regime change than democracies as a result of war' (789).[11]

Kadera, Crescenzi and Shannon (2003) further link the relationship between war and democracy. Their article concludes that the survival of democracies depends on the capabilities of the democratic group relative to other political systems in the international community. Bueno de Mesquita, Siverson and Woller (1992) show that regime changes occur almost twice as often during and immediately after wars than in peacetime and most of these regime changes affect autocracies. Given democracies' greater propensity to win wars and autocracies' greater propensity to expire in defeat, war is associated with greater democratization (Lake, 1992, Stam, 1996, Reiter and Stam III, 1998).[12]

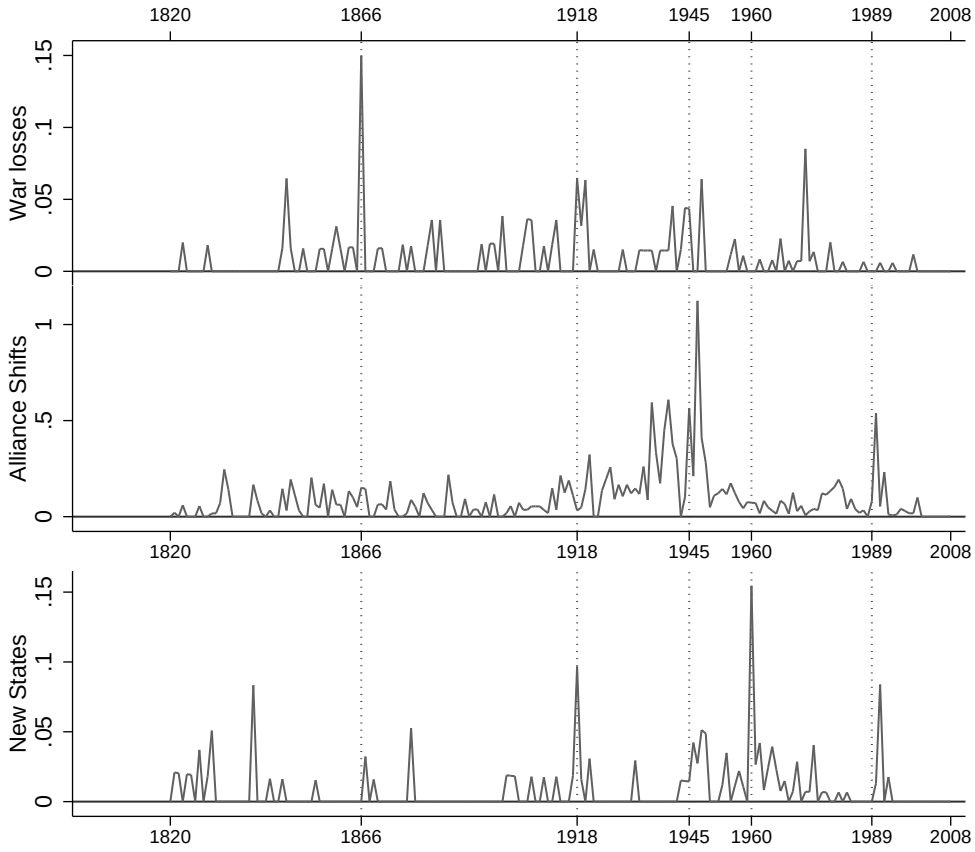
As was evident after both World Wars, democracies promoted and even imposed their form of government on the vanquished in the war's aftermath.[13] In this way, systemic shocks result in the creation of a number

[11] Mitchell, Gates and Hegre (1999) find that the dynamic whereby non-democratic regimes tend not to survive wars does not hold with lower-level military conflict (e.g., MIDs). Non-democracies tend to persist despite losing such conflicts.

[12] See Gleditsch and Hegre (1997), Crescenzi and Enterline (1999), and Cederman (2001), for studies of the systemic links between democracy and war. See Stam (1996), Reiter and Stam III (1998), and Bueno de Mesquita et al. (2003) for explanations as to why democracies are more likely to win wars than non-democracies (Gibler and Sarkees, 2004, Gibler, 2009) This pattern is evident in the three systemic shocks associated with the genesis of new states. World War One was clearly won by the democratic alliance. World War Two was a shared victory by the Western democracies and the Communist states.

[13] However, the analysis in Werner (1996) of foreign imposed regime changes suggests that there is little empirical support that fighting against a democratic opponent in war increases the chances for an imposed regime change.

Figure 6: Proportion of countries losing wars (top panel), number of alliance changes (middle panel), number of new countries (bottom panel), divided by number of countries in the interstate system, by year, 1820–2008



of new democracies, which in turn account for the crests of the waves characterizing the pattern of global democratization.

3.4.2 Global alliance shifts

A second aspect of systemic shocks is massive shifts in global alliance networks. Military alliances tend to link states with similar regime types with each other (Gibler and Sarkees, 2004). In many cases, alliances provide governments with international support for domestic institutions (Gibler, 2009).

The middle panel in Figure 6 shows the annual number of alliance shifts, weighted by the number of states in the international system. The numbers are based on COW's alliance data (Gibler and Sarkees, 2004). Both entering and leaving an alliance is coded as an alliance shift. A state can therefore be involved in several alliance shifts during one year. The world wars were accompanied by substantial shifts in the global alliance patterns, as was the end of the Cold war. In all these three cases, most changes involved countries leaving a largely non-democratic alliance to a democratic one.

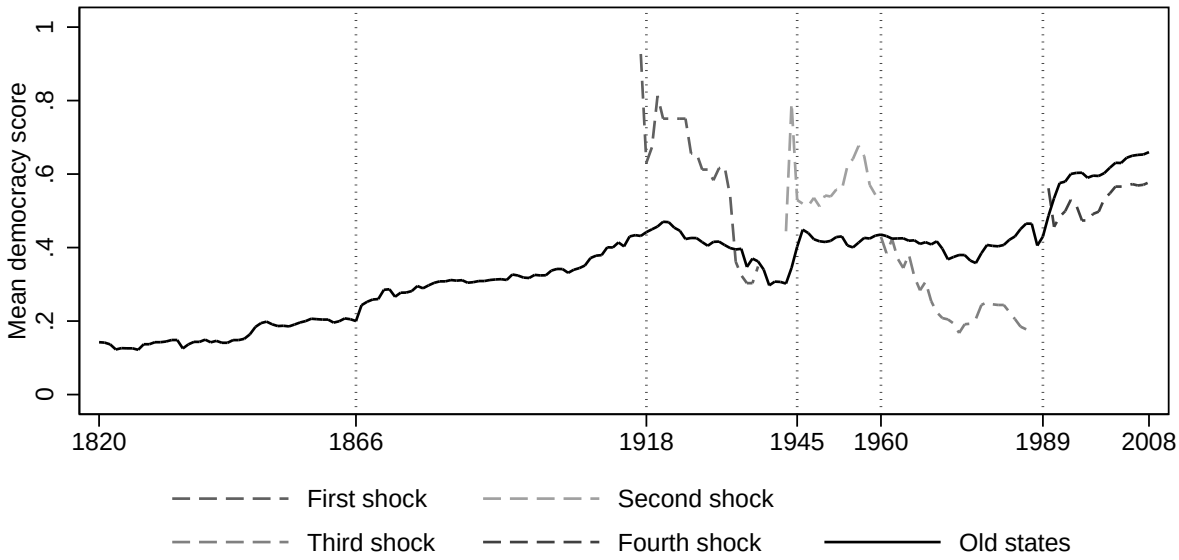
3.4.3 New states

In the aftermath of systemic shocks, a number of new states have emerged. The bottom panel in Figure 6 shows the number of new states in the international system, divided on the number of already existing states. These data are based on Gleditsch and Ward's state system membership data. The first political systems in these states, we hypothesize, were relatively democratic. If so, the emergence of new states give rise to democratic waves if independence is clustered in time. Reverse waves, however, are also linked to these new states. In particular, reverse waves are caused by the fragile nature of the political institutions created in the wake of international systemic shocks. New states eventually encounter economic or security problems and backslide towards autocracy, or elites with considerable *de facto* power find ways to overturn the unconsolidated institutions. Indeed the pattern amongst newly independent states is one of instability. Given the dispersal of power inherent in democracies, consolidation of democratic institutions is critical to their survival. This is not to say that unconsolidated democracies cannot survive, but that unconsolidated regimes are more vulnerable than consolidated regimes.

Figure 7 parallels Figure 1, but in addition to the average level of democracy for all countries (black solid line) it shows, as grey lines, the average level of democracy among countries that originated immediately after four global 'shocks': (1) World War One and the breakup of the Austro-Hungarian and Ottoman Empires (1914–1923); (2) World War Two and the decolonization of Asia (1939–48); (3) the decolonization of Africa (1960–65); and (4) the end of the Cold War (1988–1995).

The first 'after-shock' wave (1917–) shows a remarkable trend. The average democracy value among

Figure 7: Four waves of new countries and their average democracy scores



the new states is initially very high, but it subsequently falls, reaching a trough with the start of World War Two. These new countries alone play a significant role in defining the wave and subsequent backsliding during this period. The third 'shock' after 1960 display a similar pattern. The initial democracy levels were considerably lower, however, reflecting that most new states in the 1960s were very poor countries in Africa South of Sahara.

The second shock, the one following World War Two, is somewhat different since the tendency for new states to backslide is weaker. But the new states were clearly more democratic than the global average, explaining a considerable part of Huntington's second wave.

The fourth shock, the end of the Cold War and the disintegration of the Soviet Union, produced an effect similar to that seen following the end of both World War One and World War Two also gave birth to fledgling democracies. The decline immediately after independence was of shorter duration less marked than for the other shocks, however, and the new states proceeded to take part in the global trend of democratization. What is remarkable about the years immediately following the end of the Cold War is the huge leap in democracy levels among all the states that existed before 1989. Democratization in Eastern Europe did not lead to the same reversals as the other shocks, possibly because they occurred in well-established countries.

Figure 7 provides support for Propositions 4.6 and 4.5. Systemic shocks are associated with global bursts of political transformation. Democratizing spikes are associated with all four clusters of state creation. By singling out the states created in conjunction with these shocks, we see one reason why democratic waves crest. This disaggregation also allows us to track the reverse waves, which tend to be disproportionately

associated with the backsliding of these newly created states.

3.4.4 Implications of the system-shock variables

This argument gives rise to the following propositions:

Model 4 *System-shock model*

4.1 *Shocks to the international system (systemic wars) will result in significant increases in the likelihood of democratization.*

4.2 *States are more likely to democratize immediately after major losses in war*

4.3 *Large changes in countries' alliance portfolios are associated with a higher risk of transition*

4.4 *New states are more likely it is to experience political changes in either direction*

4.5 *New states are more likely it is to experience political changes towards autocracy*

4.6 *New states tend to be more democratic than old states with similar characteristics*

4 An empirical model of political transitions

The figures presented so far in this paper provide visual evidence to support our proposition that there are waves of democratization and that these waves are caused by international shocks and the creation of newly independent states. We now turn to a multivariate statistical analysis of political instability to rigorously test these propositions, controlling for other variables as well.

4.1 Testing strategy

To test these propositions, we need an empirical model that satisfies the following criteria: It relates the probabilities of change toward democracy, change toward autocracy, and no change to each other, specifies these probabilities as functions of the explanatory variables of interest, captures sufficiently fine-grained changes to the SIP index, and allows the transition probabilities to be dependent on the initial type of institution. To compensate for the lack of flexibility in this model relative to the full Markov Chain model, we code a set of covariates modeling the status at $t-1$ that reflects our a priori knowledge about these transitions. All this can be facilitated with the multinomial logistic regression model specified below. We estimate models on 80% of the countries for which we have data, and estimate models for all three change thresholds discussed above (see Table 1).

We make use of four different metrics to compare the explanatory power of the four models relative to each other and to a 'baseline model' with only constant terms.

First, we compare the log likelihood of the models, all of which are are estimated using identical data sets.

Next, we compare the models' fit to the data using *separation plots* (Greenhill, Ward and Sacks, 2011). Each vertical line in a separation plot represents an observed positive outcome, and non-lines negative outcomes. The x-axis in the plot reflects the ranking of all the country years in terms of predicted probability of the outcome – low predicted values to the left, and high predictions to the right. Good models have high predicted probability for most observed positive outcomes. Separation plots, then, have most vertical lines to the right of the figure. We construct separate separation plots for democratization and autocratization outcomes.

Third, we compare the predicted outcomes (democratization or autocratization) with observed outcomes for the 20% of the countries we left out of the estimation, and calculate the AUC score as an indicator of predictive ability. AUC is short for 'Area Under Curve', or more precisely the area under the Receiver Operator Curve.[14] The AUC is equal to the probability that the simulation predicts a randomly chosen positive observed instance as more probable than a randomly chosen negative one. A random-guess simulation, then, would have an AUC of 0.5. Models that predict better have higher values, and perfect predictions yield an AUC of 1.0.

Finally, we calculate the average of the predicted probability of change in either direction for each year. We then calculate the difference between the two annual probabilities as a measure of 'net predicted change'. If our model is well suited to predict waves and reverse waves, the annual net predicted change should fluctuate along the same pattern as shown in Figure 3.

4.2 Dependent variable

Institutional change: Whether the present value of the SIP index has changed by a value of more than 0.03 from the previous year, either upwards (democratization) or downwards (autocratization).

4.3 Independent variables in our four models

We will specify five different models to organize the testing of our propositions. The baseline model only includes constants and the upper and lower end terms. The first proper model includes internal economic factors only, the second includes neighborhood factors, the third indicators of internal institutional 'stickiness', and the final the impact of system-wide shocks and the creation of new states.

[14] See Hosmer and Lemeshow (2000, p. 156–164) for an introduction to Receiver Operator Curves, AUC, and the related concepts of sensitivity (or True Positive Rate) and specificity (1 – False Positive Rate) in the context of logistic regression. Also see Ward, Greenhill and Bakke (2010).

The democracy index has a theoretical range from 0 to 1. Further democratization is impossible when the country has reached the upper end of the scale and autocratization is impossible at the lower end. We model this by coding indicator variables for whether $SIP_{t-1} < 0.06$ (lower end) and $SIP_{t-1} > 0.91$ (upper end).[15]

Upper end: A dummy variable that denotes whether the SIP index last year was higher than .91.

Lower end: A dummy variable that denotes whether the SIP index last year was lower than .06.

4.3.1 The economic model

In this model, we test propositions 1.1 and 1.2. It includes two variables:

GDP per capita: The natural logarithm of constant-dollar GDP per capita. The variable is lagged by one year. We also include the square of log GDP per capita to be able to model the non-linear relationship apparent in Figure 5. We use the GDP data of Maddison (2007), which are measured in 1990 International Geary-Khamis dollars – referred to as 'Int$' (Maddison, 2010). To reduce missingness we have interpolated data, as well as supplemented with GDP data from World Bank (2011) and Gleditsch (2002*b*). In order to obtain comparability between the three latter sources and Maddison we have used their common observations to 'translate' their values to Maddison values. The exact conversion procedure is documented in an online Appendix.

GDP growth: Growth in constant-dollar GDP per capita. The variable is measured as the difference in log GDP per capita between year $t-1$ and t, and is lagged by one year. Sources are the same as for GDP per capita.

4.3.2 The diffusion model

In this model, we add another three variables that facilitate testing of propositions 2.1, 2.2, and 2.3, regarding diffusion effects.

Global SIP pull: The difference between average democracy in the world and the democracy level of the country under observation. Democracy is measured by means of the 'Scalar Index of Polities' (SIP; Gates et al., 2006). The SIP index is constructed as the mean of the three dimensions of the MIRPS model,[16]

[15] These values were chosen to ensure that there was a small but non-zero number of changes in either direction beyond these limits.

[16] MIRPS is an aggregation of Polity (Jaggers and Gurr, 1995) and Vanhanen (2000) data.

which are decision constraints on the executive, regulation of executive recruitment, and participation in competitive elections (cf. Gates et al., 2006; Appendix I). The global SIP pull variable is lagged by one year, and is used as an indicator of the pull effect of the global level of democratization – if the country is less democratic than the global average, the 'pull' variable is positive. If it is more democratic, the pull is negative.

Neighborhood SIP pull: The difference between the country's SIP value and the average SIP in the country's immediate neighborhood. We define the neighborhood of country A as the countries that are directly contiguous to A as coded by Stinnett et al. (2002). The variable is lagged by one year. It accounts for the pull from one's contiguous neighbors, in the same way as for the Global SIP pull variable.

Change in neighborhood: Change in neighbors' weighted average SIP score from year_{t-2} to year_{t-1}. The average is weighted by the population size of the neighbors, defined above. For countries that have missing SIP score for year_{t-2}, but not for year_{t-1} and year_{t-3}, year_{t-2} has been replaced by year_{t-3}.

4.3.3 The internal model

In the 'internal' model, we add three variables to the 'economic' model that allow us to test Propositions 3.1, 3.2, and 3.3. We enter the SIP value at $t-1$ and its square term to model that polity changes are far more common in inconsistent polities; the mid-range of the SIP index.

SIP: The SIP index of democracy, lagged to model the relationship between the level of democracy and the probability of democratizations or autocratizations.

SIP squared: The variable is squared to model the higher instability of regimes in the intermediate range of the democracy index (cf. Gates et al., 2006).

Brevity of polity: The probability of a regime change is likely to be dependent on whether there has recently been a change in the country. We include two terms to capture this. Both variables are decay functions $y = 2^{-t/\alpha}$ of the time t since the last change in either direction (defined as for our dependent variable). One of them is constructed with a half-life of $\alpha = 16$ years, the other with a half-life of $\alpha = 4$ years. For countries that existed in 1816, we set time since regime change as equal to time since independence (see below).

4.3.4 The system-shock model

The final model adds six variables that allow testing of propositions 4.1–4.5. The three first variables are systemic – they vary only by year, not by country. The other three variables vary by year and by country. Sources for war variables are Sarkees and Wayman (2010), for alliance variables Gibler and Sarkees (2004), and for independence an updated version of Gleditsch and Ward (1999). We recode independence dates for all countries that were independent in 1816.[17]

The operationalizations used in the statisitical analysis differ somewhat from those used in Figure 6.

Systemic war: The variable is based on the annual count of states that lost an interstate war, divided by the number of countries in the system that year (see Figure 6). We use the square root of this value, and calculate the average of the values for the two preceding years ($t-1$ and $t-2$).

Systemic alliance shift: The variable is based on the annual count of states entering or leaving an alliance, divided by the number of countries in the system that year (see Figure 6). We use the square root of this value, and calculate the average of the values for the two preceding years ($t-1$ and $t-2$).

Systemic state creation: The variable is based on the annual count of states that became independent, divided by the number of countries in the system that year (see Figure 6). We use the square root of this value, and calculate the average of the values for the two preceding years ($t-1$ and $t-2$).

Proximity of war loss: The variable is a decay function of the time since the country last lost in an interstate war, with a half-life of one year. This and the next 'proximity of' variable have the value 1 just after a war loss (when the loss is proximate in time), and decays to 0 after many years.

Proximity of alliance change: The variable is a decay function of the time since the country last entered or left an alliance, with a half-life of one year.

Proximity of independence: The variable is a decay function of the time since the country gained independence, with a half-life of 4 years.

[17] The most recent version of the Gleditsch & Ward list is found at `http://privatewww.essex.ac.uk/~ksg/statelist.html`. For practical purposes we left-censor all independence dates to 1 January 1700. The list of countries independent in 1700 was: the United Kingdom; the Netherlands; France; Switzerland; Spain; Portugal; Austria (Holy Roman Empire); Russia; Sweden; Denmark; Morocco; Algeria; Oman; Persia; Ottoman Empire; Burma; Thailand; and China. Another set of countries became independent between 1700 and 1816: United States of America, 1781; Haiti, 1804; Paraguay, 1811; Preussen, 1701; Sardinia, 1720; Norway, 1814; Tunisia, 1705; Libya, 1711; Afghanistan, 1747; Nepal, 1768. These dates, their rationale and the coding criteria are outlined in an online appendix, available on `http://to.be.announced`.

5 Results and discussion

Our empirical analysis proceeds in several steps. First, we estimate a baseline multinomial logit model without any covariates. We then add the independent variables associated with the economic model in a second logit model. The multinomial logit models are estimated on a random sample of 80% of the country years in the 1816–2008 period. In addition to interpreting the coefficents from this model, we explore how well it predicts out-of-sample changes toward democracy and toward autocracy at the country-year level. We also show how well the predictions aggregated over all countries for every year match the observed wave pattern shown in Figures 2 and 3. We then add the explanatory variables for the diffusion model and for the two other models, and repeat the analysis.

The results from the multinomial logit model estimation for the 0.03 change threshold are presented in Table 2. The table has one column for each of our five models. In Appendix A-1 and A-2 we show corresponding results for the two other change thresholds.

5.1 The baseline model

The left-most column shows the results from estimating a model with only constant terms and our upper-end and lower-end variables. This model has no intrinsic value but serves as a baseline against which we can compare the explanatory power of our models.

To facilitate comparison of the explanatory power of our four models, the AUCs for the five models are shown in Table 3. Two sets of AUC values are reported for each model along with their estimated 95% confidence intervals. In the upper half of the table, the predicted probability of autocratization is compared with observed instances of change toward democracy according to our definition. In the lower half, the predicted probability of democratization is compared to instances of change toward autocracy. We report AUCs for all three change thresholds to demonstrate that our conclusions are robust to the choice of threshold for the dependent variable. For threshold 0.03, the AUCs for the baseline model are 0.621 for autocratization and 0.504 for democratization.[18] We will mainly report the AUCs for the 0.03 threshold in what follows.

5.2 The economic model

The second column presents the results from the 'economic' model. Our propositions 1.1 and 1.2 receive considerable support in this model. In line with the results in Lipset (1959), Przeworski et al. (2000), and other studies, per-capita income is negatively correlated with the risk of autocratization and, up to a point,

[18] AUC scores are comparable across models, but not across dependent variables. AUC scores are somewhat higher for the more restrictive thresholds. Since changes become more rare with larger thresholds, a larger proportion of predictions are true negatives. Since true negatives are of less interest than true positives, the AUCs across dependent variables are not comparable. Also note that the confidence intervals are wider for the more restrictive change thresholds.

Table 2: Multinomial logit model results, four equilibrium models, 1816–2008

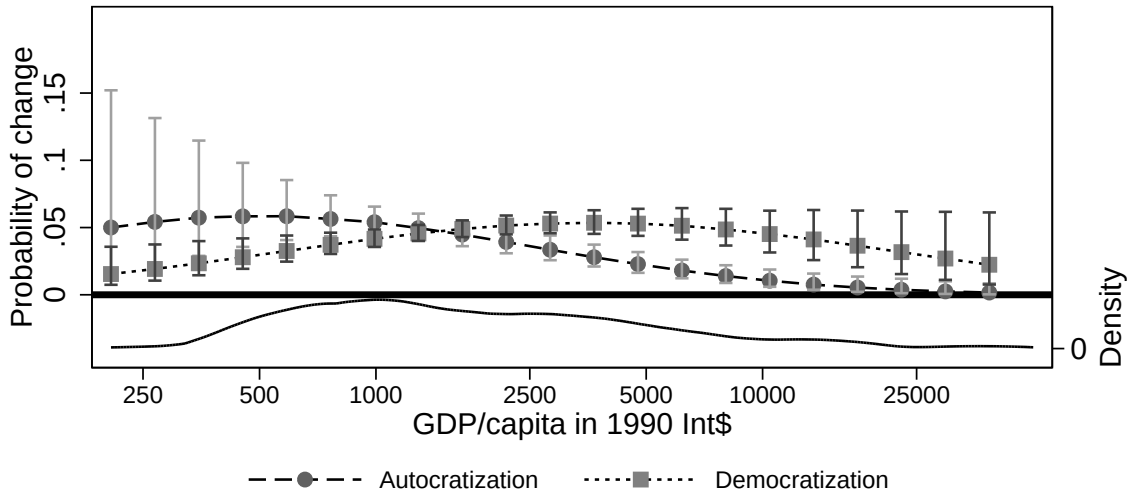
	Baseline	Economic	Diffusion	Internal	System shock
Autocratization					
Log, centered GDP per capita, t–1		-0.693***	-0.548***	-0.396***	-0.406***
		(-5.05)	(-3.97)	(-3.36)	(-3.52)
Log GDP per capita squared		-0.197	-0.208	-0.102	-0.0910
		(-1.85)	(-1.94)	(-1.03)	(-0.98)
Economic growth, t–1		-2.554	-2.660	-2.543*	-1.878
		(-1.77)	(-1.84)	(-1.97)	(-1.55)
Global SIP pull			1.392***	1.778*	2.252**
			(3.36)	(2.33)	(2.78)
Neighborhood SIP pull			-1.894***	-1.640***	-1.586***
			(-4.45)	(-4.00)	(-3.93)
Change in neighborhood			1.068	0.647	0.601
			(1.20)	(0.76)	(0.77)
SIP score, t–1				2.278**	3.064***
				(2.87)	(3.61)
SIP score squared, t–1				-6.595***	-7.660***
				(-4.89)	(-5.75)
Brevity of polity, $\alpha = 16$				1.257	1.065
				(1.58)	(1.37)
Brevity of polity, $\alpha = 4$				0.125	0.0691
				(0.24)	(0.13)
Systemic war					0.337*
					(2.35)
Systemic alliance shift					0.281
					(0.56)
Systemic state creation					0.0989*
					(2.54)
Proximity of war loss					0.586
					(0.74)
Proximity of alliance change					0.293
					(1.14)
Proximity of independence					0.823
					(1.93)
Lower end	-3.129***	-3.490***	-3.369***	-1.944**	-1.848**
	(-5.37)	(-5.89)	(-5.72)	(-2.96)	(-2.84)
Constant	-3.312***	-3.295***	-3.385***	-3.913***	-4.160***
	(-28.60)	(-23.12)	(-23.84)	(-9.10)	(-9.54)
Democratization					
Log, centered GDP per capita, t–1		0.0424	0.105	0.0620	0.0649
		(0.47)	(1.11)	(0.73)	(0.78)
Log GDP per capita squared		-0.157*	-0.168*	-0.109	-0.0961
		(-2.40)	(-2.34)	(-1.77)	(-1.53)
Economic growth, t–1		-2.980***	-2.976***	-3.000***	-2.961***
		(-3.56)	(-3.55)	(-4.20)	(-4.11)
Global SIP pull			0.412	2.409***	2.563***
			(1.30)	(5.04)	(5.02)
Neighborhood SIP pull			0.933**	1.210***	1.231***
			(2.84)	(3.96)	(4.09)
Change in neighborhood			0.428	0.0290	-0.0320
			(0.44)	(0.03)	(-0.03)
SIP score, t–1				2.481***	2.681***
				(4.95)	(4.88)
SIP score squared, t–1				-5.709***	-5.806***
				(-6.04)	(-6.05)
Brevity of polity, $\alpha = 16$				0.243	0.228
				(0.47)	(0.44)
Brevity of polity, $\alpha = 4$				0.221	0.239
				(0.53)	(0.57)
Systemic war					0.0398
					(0.31)
Systemic alliance shift					0.628
					(1.64)
Systemic state creation					0.00656
					(0.24)
Proximity of war loss					0.195
					(0.29)
Proximity of alliance change					-0.322
					(-1.10)
Proximity of independence					-0.429
					(-0.81)
Upper end	-3.087***	-3.047***	-2.628***	-1.636**	-1.668**
	(-5.96)	(-5.76)	(-4.82)	(-2.75)	(-2.82)
Constant	-2.980***	-2.788***	-2.863***	-2.686***	-2.817***
	(-42.46)	(-31.41)	(-29.80)	(-10.53)	(-9.99)
N	7826	7826	7826	7826	7826
log likelihood	-2133.9	-2089.7	-2056.0	-1982.3	-1968.2

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: AUCs for the five models; Out-of-sample evaluation (20%)

		Model				
Outcome	Threshold	Constants only	Economic	Diffusion	Internal	System shock
Autocratization	0.03	0.621	0.793	0.712	0.807	0.812
		(0.607,0.636)	(0.750, 0.836)	(0.659, 0.766)	(0.763, 0.850)	(0.768, 0.855)
	0.10	0.625	0.801	0.695	0.796	0.809
		(0.608,0.643)	(0.747, 0.854)	(0.633, 0.756)	(0.740, 0.852)	(0.752, 0.865)
	0.20	0.628	0.778	0.736	0.847	0.874
		(0.603,0.653)	(0.704, 0.853)	(0.650, 0.823)	(0.792, 0.902)	(0.826, 0.923)
Democratization	0.03	0.504	0.686	0.692	0.735	0.745
		(0.475,0.533)	(0.672, 0.729)	(0.639, 0.744)	(0.688, 0.782)	(0.699, 0.792)
	0.10	0.525	0.685	0.712	0.744	0.757
		(0.490,0.561)	(0.635, 0.736)	(0.652, 0.773)	(0.691, 0.796)	(0.705, 0.809)
	0.20	0.569	0.669	0.795	0.814	0.841
		(0.514,0.624)	(0.599, 0.740)	(0.725, 0.865)	(0.750, 0.879)	(0.788, 0.894)

Figure 8: Probability of change, economic model: toward democracy (dashed line), toward autocracy (solid line)



positively correlated with democratization. Figure 8 shows how the estimated log odds of change in this model vary by income level. As expected from Figure 5, the relationship between GDP per capita and the likelihood of change in either direction is non-monotonic. We estimate that changes toward autocracy are most likely at about Int$ 500 (the level of China in 1950 or Niger in 2000), and democratizations most likely at about Int$ 4,000 (Finland in 1950 or Guatemala in 2000). At income levels under about Int$ 2,000 (Portugal 1950 or India 2000), changes toward autocracy are more likely than changes toward democracy, and vice versa over Int$ 2,000.

The estimated relationship is quite strong – the odds of change toward autocracy for a poor country like Niger is about 6 times higher than that of a rich country like South Korea.[19] Correspondingly, the odds of change toward democracy are 40% higher in South Korea than in Niger. Economic growth reduces the odds

[19]GDP per capita for Niger in 2008 is Int$ 485. That of South Korea is Int$ 19,200. The difference in log GDP per capita is 3.68.

of change in either direction – a one-percent increase in annual growth reduces odds of autocratization by about 2.4% and that of democratization by about 3%.[20]

How well does the model fit the data? Adding the six terms to the model improves log likelihood by 44,2 – a very sizeable increase. The out-of-sample prediction evaluation in Figure 3 confirms this impression. The AUC for the autocratization outcome has increased from 0.621 in the baseline model to 0.793, and from 0.504 to 0.686 for democratization. This is also seen in the 'separation plots' for this model shown at the bottom of Figure 9. We display one separation plot for democratization (top), and one for autocratization (bottom). A larger fraction of the observed outcomes lie to the right in the rightmost plot, reflecting that the model has better predictive power for autocratizations.

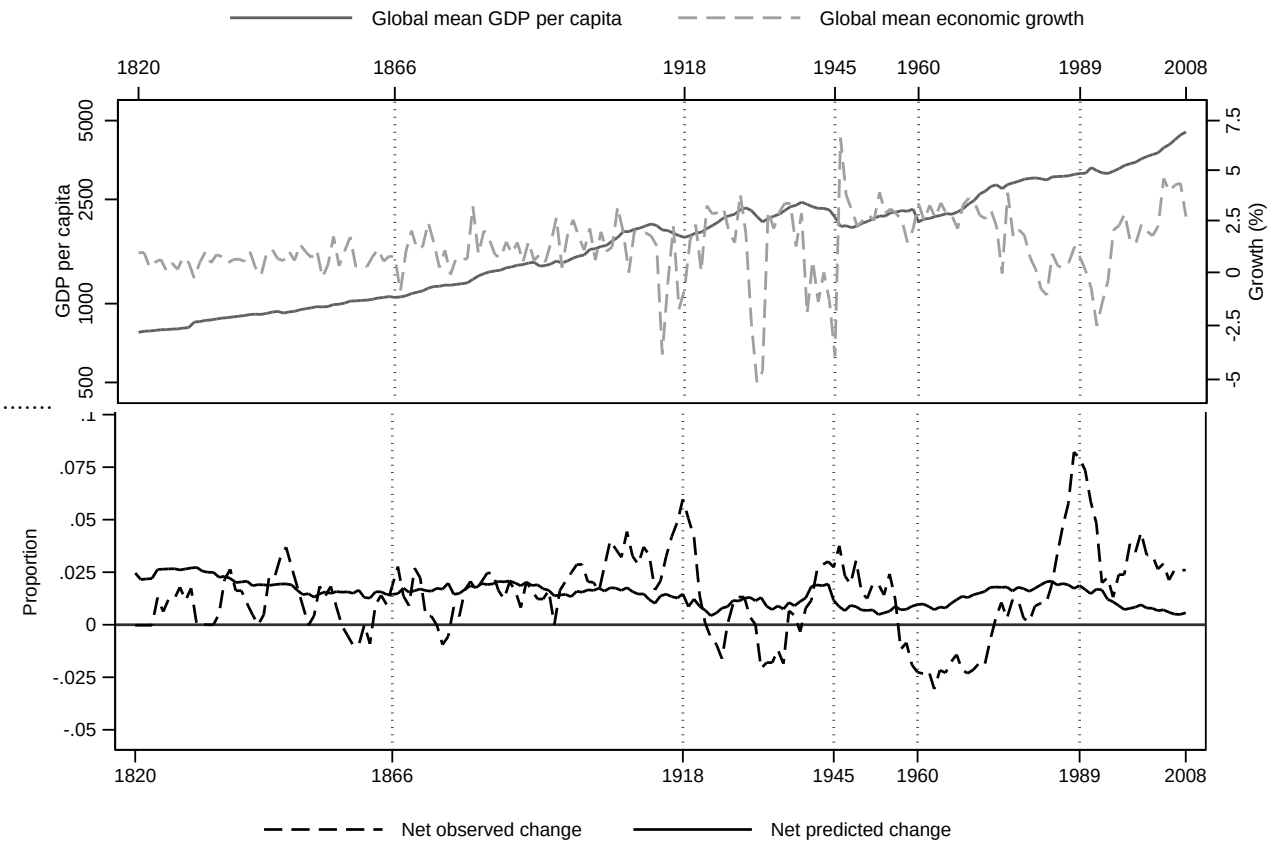
The upper part of Figure 9 shows the global (non-weighted) averages for the income and growth variables. Global income has been increasing steadily since the 1820s, although the average has dropped a few times when many new, poor countries entered the system and during global economic crises. The steady increase in average income explains that a majority of regime changes are in the direction of democracy, but this change alone is too slow to help predicting clustered changes. It took South Korea, one of the most rapidly growing economies of the 20th century, more than 70 years to grow from being as poor as Niger to its level today. The recession in the 1930s is clearly associated with a reverse wave. A few other periods of negative growth also coincide with reverse waves. These, however, are also associated with world wars and the generation of new states.

The middle panel in Figure 9 gives another portrait of the explanatory power of the economic model.The dotted line repeats the top panel of Figure 3, showing the net proportion of changes toward democracy as a moving average. It also shows, as a solid line, the net predicted change or the difference between the predicted probabilities of democratization and autocratization. If the model is a good model of democratic waves, the predicted changes should follow a pattern that resembles the observed patterns. More precisely, the predicted probabilities of changes toward democracy should be high during the democratic wave periods identified in Section 2 (1816–1920, 1940–1955, 1975–), and low during the reverse waves (1921–1939, 1956–1974). The converse should hold for the predicted probabilities of autocratization.

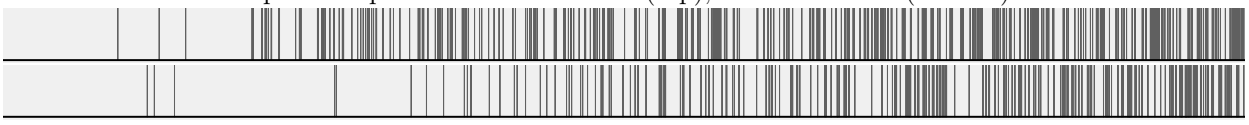
The aggregated predictions from the economic model do vary over time, with a higher net probability of democratization in the 1980s than in the 1950s, for instance. But the predictions from the economic model do not reflect the observed waves very well. For the most part, the predicted lines are mostly flat. The predicted net democratization is somewhat lower in the two reverse wave periods, but the differences over time are very slight. The first part of the third wave is visible in the predictions, but the economic-model

[20]The growth variable is measured as difference in log GDP per capita, so that a change of 0.01 roughly corresponds to 1 percent growth.

Figure 9: Top panel: GDP per capita and growth, global means. Middle panel: Observed change and predicted probability of change, toward democracy or autocracy, predictions based on the economic model. Bottom: Separation plots.



Separation plots: Democratization (top), autocratization (bottom)



predictions imply that the post-cold war period should have seen a democratic reversal.

The correlation between predicted and observed net change toward democracy is 0.097 for this model. This correlation will serve as a baseline against which we will compare the next models.

5.3 The diffusion model

In column 3 in Table 2, we added the terms belonging to the diffusion model. Most of our estimates are in line with our expectations: In the democratization equation, the estimates for 'Global SIP pull' and 'Neighborhood SIP pull' are positive and statistically significant (Proposition 2.1 and 2.2). If these two variables have positive values, i.e. if the world or the neighborhood is more democratic than the country in question, the probability of change toward democracy increases. In the equation for autocratization, the estimate for neighborhood pull is negative as expected: If the neighborhood is more democratic than the country, the risk of change toward autocracy decreases. The estimate for 'Global SIP pull' in the autocratization equation has the opposite sign of what we expected.[21] The estimates for the 'Change in neighborhood' variable are positive but not statistically significant, weakly in line with Proposition 2.3.

Our measures of model fit do indicate that the diffusion variables improve our model of institutional change. The log likelihood increase by another 33.7 points, and the separation plots a the bottom of Figure 10 demonstrate a slightly better ability to distinguish change cases from non-change cases. The out-of-sample AUC in Table 3, however, indicate that the external influence variables only marginally improve the model's ability to predict democratization, and even impairs considerably its ability to predict autocratization. If we restrict the dependent variable to larger changes, the diffusion model improves considerably the ability to predict democratization relative to the economic model.

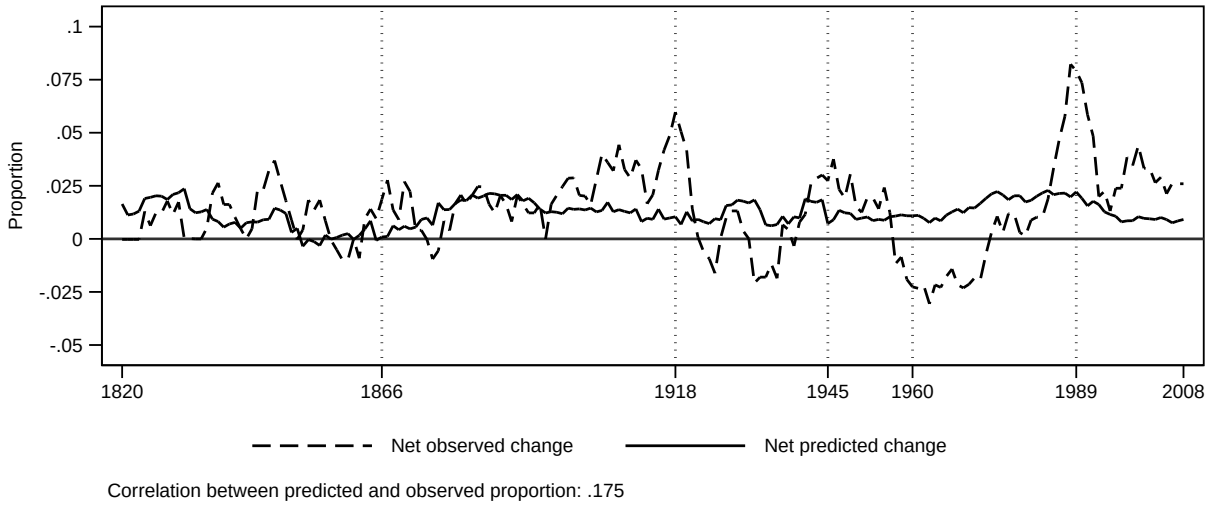
The main plot in Figure 10 also suggests that the diffusion model improves somewhat the prediction of wave behavior in aggregate. The correlation between net observed and predicted change has increased to 0.175. The model captures to some extent the minor reverse wave in the 1860s and the second half of the first reverse wave (in the 1930s), but does not add anything to explaining the positive waves.

5.4 The internal model

In column 4 in Table 2, we have added four terms that allow testing Propositions 3.1, 3.2, and 3.3. The estimates for the 'SIP score' and 'SIP score squared' terms support Proposition 3.1 – inconsistent regimes are more likely to experience political transitions than consistent ones. The estimated probabilities of the two

[21] These two estimates should be interpreted jointly. If a country is less democratic than the global average but close to its neighbors' levels (as is typical in Africa South of the Sahara, for instance), the net pull toward autocratization is positive. If a country is less democratic than the neighborhood mean, but close to the global average (as in Spain under Franco), the net pull toward autocratization is negative.

Figure 10: Top panel: Observed change and predicted probability of change, toward democracy or autocracy, predictions based on the diffusion model.

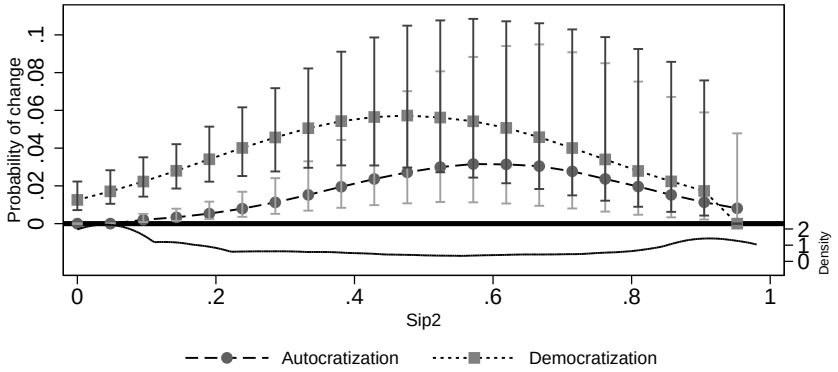


Separation plots: Democratization (top), autocratization (bottom)

types of change is plotted as a function of initial SIP in Figure 11. The figure was created using Clarify (King, Tomz and Wittenberg, 2000), and is estimated using independent variable values similar to those of Egypt, 2000. The probability of change is high at intermediate levels of the SIP index (although these estimates come with considerably uncertainty). For a country like Egypt, 2000, the estimated probability of change toward democracy has a maximum at about the 0.45 on the SIP index, whereas the probability of change toward autocracy peaks at 0.65. Proposition 3.2 is not clearly supported since our example country is more likely to change toward democracy than toward autocracy independent of its point of departure. As can be inferred from Figure 8, however, poorer countries are more likely to change toward autocracy when they are closer to the autocratic endpoint.

Proposition 3.3 implies that polities that have existed for a short period are more likely to change. The estimates in Table 2 indicate that such consolidation reduce the risk of autocratization, but does not affect the risk of democratization. The combined effect of the estimates for 'Brevity of polity, $\alpha = 16$' and 'Brevity of polity, $\alpha = 4$' in the democratization equation means that the risk of autocratization is initially high, is reduced to about half of this level after 21 years, and half of this again after 38 years. The estimates in the autocratization equation also imply that the probability of democratization is high in the first year after a change, but the effects are much smaller, vanishes more quickly, and are not statistically significant. Adding the terms for the internal model also strengthens the impact of the diffusion terms in the democratization

Figure 11: Probability of change, internal model: toward democracy (dotted line), toward autocracy (dashed line), and the distribution of country years over the SIP democracy index



equation. The estimate for 'global SIP pull' is much larger than in Column 3, and that for 'neighborhood SIP pull' slightly larger. Also note the changes in the estimates for the diffusion-model variables from the diffusion model to the internal model in Table 2. In the democratization equation, the diffusion variables now have a much stronger impact. When taking into account that some institutional constellations are more likely to democratize than others, we capture how changes outside a country may lead to democratization.

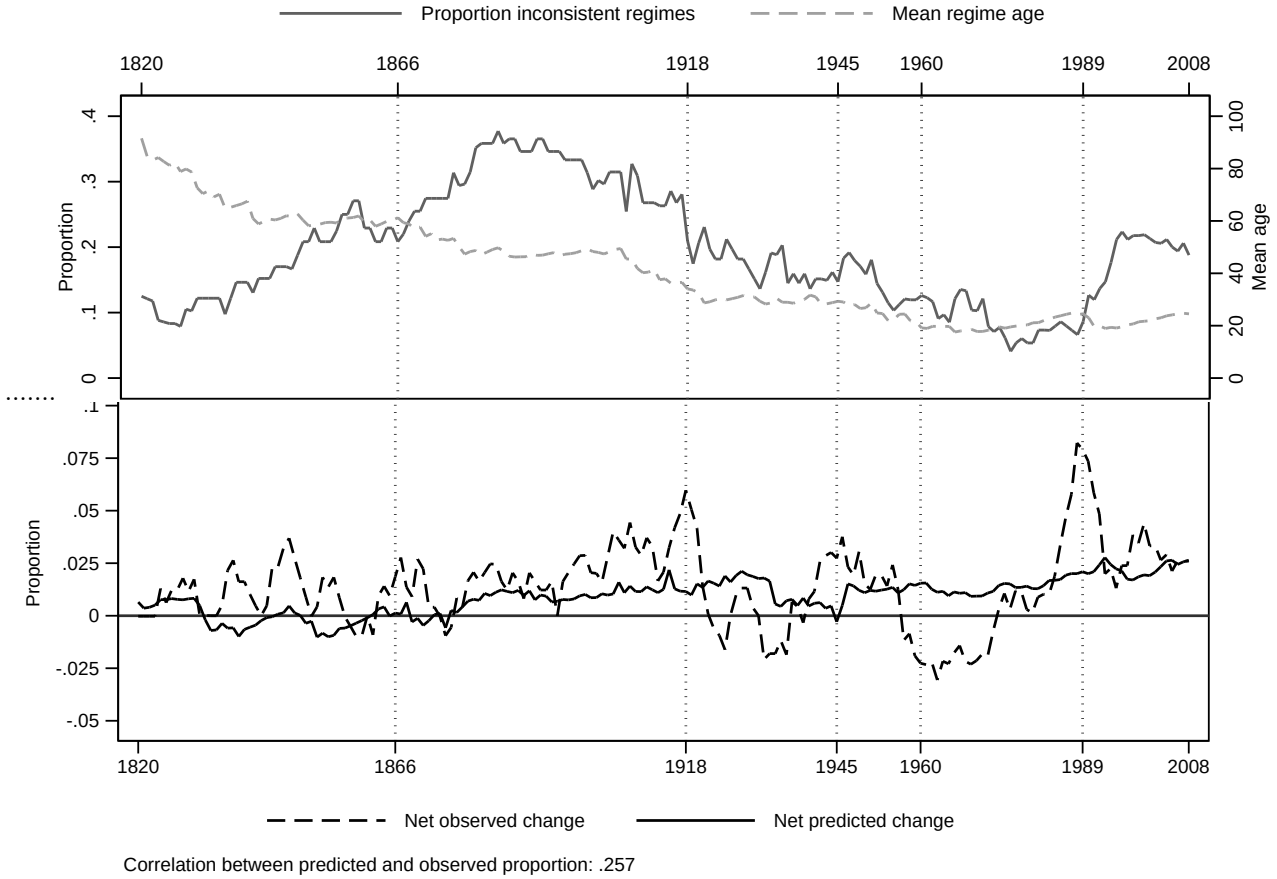
The improvement in log likelihood by adding these four variables is again very large; 73.7 points. The separation plots (bottom of Figure 12) show improved in-sample predictive ability. Table 3 shows that taking the internal consistency and consolidation of regimes into account considerably improves the out-of-sample predictive performance of the model – from 0.712 to 0.807 for autocratization, and from 0.692 to 0.735 for democratization.[22] The correlation between predicted and observed net change has further increased to 0.257.

The top panel of Figure 12 shows the proportion of the world's countries that are inconsistent and the mean age of regimes. To what extent do systemic changes in these variables help predicting the democratic waves? The most remarkable change is the build-up of inconsistent regimes from 1820 to the 1880s as autocratic regimes in Europe gave way to limited-suffrage democracies. As universal suffrage spread from about 1900 and new autocratic countries entered the system, the proportion of inconsistent regimes gradually decreased until 1989. Afterwards, partial democratization took place in a large number of autocracies. This pattern of gradual democratization contributes greatly to the last parts of the first and third waves. The predicted net democratization in the middle panel of Figure 10 shows that this model reflects the observed pattern in the 1890–1919 and 1989–2008 periods much better than the earlier models.

Global trends in consolidation also partly coincide with the wave patterns. The mean regime age (i.e., the global mean for all countries of time since last regime change according to our definitions) increased up

[22]The improvement for democratization is less when we restrict attention to changes larger than 0.20.

Figure 12: Top panel: Proportion inconsistent regimes and mean regime age in the world, 1820–2008. Middle panel: Observed change and predicted probability of change, toward democracy or autocracy, predictions based on the internal model. Bottom: Separation plots.



Separation plots: Democratization (top), autocratization (bottom)

to 1917, and then dropped considerably, paving the way for the first reverse wave. Similarly, mean regime age decreased from 1942 to 1965, allowing for the second reverse wave.

Still, the internal model poorly captures the drivers of the reverse waves between the World Wars and in the post-World War II period. We need to look into system-shock variables to understand why these occurred.

5.5 The system-shock model

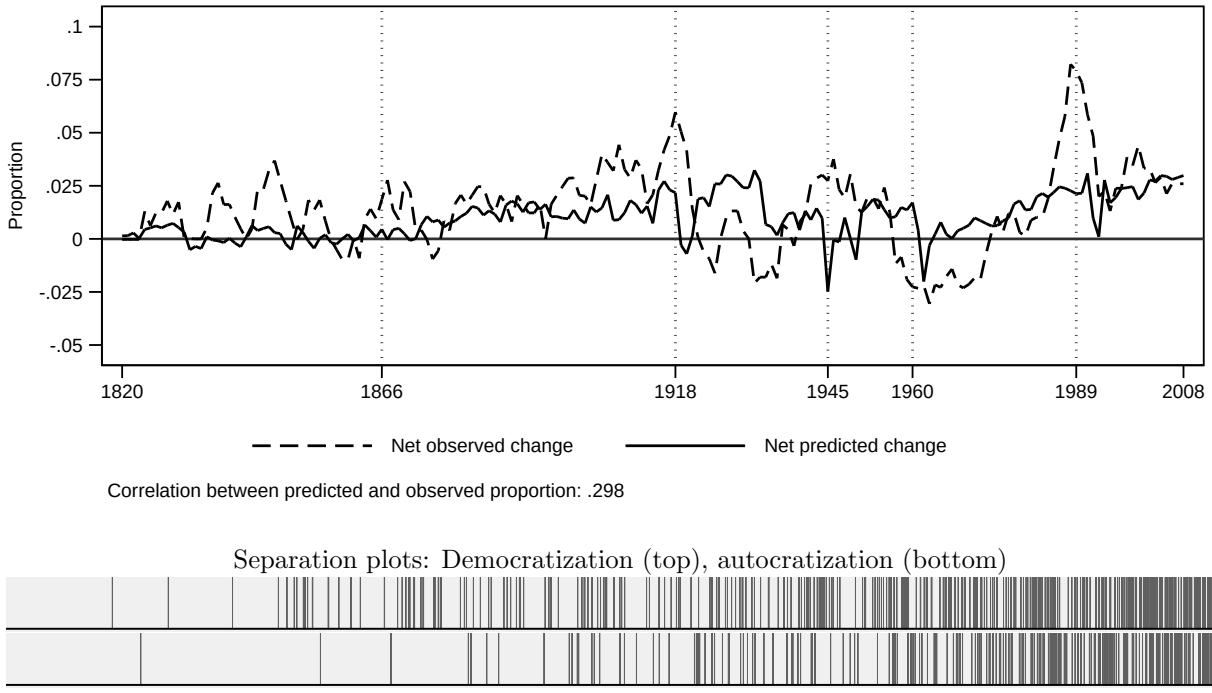
The fifth column in Table 2 presents results from a model where we add the system-shock variables: systemic war losses, alliance shifts, and state creation, and the country-level variables denoting time since these events. The estimates indicate that changes toward autocracy were particularly frequent in years of systemic war and of state creation, and tended to occur more frequently in the first years after independence. The estimates in the democratization equation are less significant, but vaguely imply that democratization was more frequent following systemic alliance shifts, but not necessarily in the countries that switch alliance partners.

The estimates do not clearly support our system shock propositions. Propositions 4.1 and 4.2 expect changes toward democracy to be more likely just after systemic wars and losses in war. There is little evidence to support this. In contrast, countries are more likely to change toward autocracy after such events. Proposition 4.3 also receives mixed support. Our systemic alliance shift variable has a positive estimate in the democratization equation, implying that large changes such as the end of the Cold War is followed by democratization. The estimate is not significant, however, and the estimate for 'Proximity of alliance change' that reflects how alliance changes affect the countries that change has the opposite sign. Proposition 4.4 is tested by means of the 'Systemic state creation' variable. This has a positive and significant estimate in the equation for autocratization – countries are more likely to change toward autocracy immediately after decolonization shocks. Likewise, Proposition 4.5 is supported by the positive and borderline significant estimate for the 'Proximity of independence' variable in the autocratization equation. Countries are more likely to change toward autocracy in the first years after independence, giving rise to the reverse waves discussed in conjunction with Figure 7.

The individual estimates give only mixed support for our set of system-shock propositions. This, however, may be partly due to considerable correlation between the shock variables, and between these variables and variables such as the 'Brevity of polity' variables. New states always have new political systems, and a portion of the state creation effect may be picked up by the very robust estimate for the 'Brevity of polity' variable.

To get a more complete picture of the importance of system shocks, we must look into the aggregate performance of the system-shock model. From such a perspective, new light is cast on the role of system

Figure 13: Observed change and predicted probability of change, toward democracy or autocracy, predictions based on the system-shock model.



shocks. First, the additional six variables do improve the fit of the model to the data. The log likelihood increases by another 14.1 points, which is a statistically significant increase. The out-of-sample evaluations in Table 3 show slight improvements for the 0.03 change threshold, and considerable improvements for the more restrictive regime change definitions. The improved ability of this model to explain democratic reversals is clearly seen in the net predictions in Figure 13. Indeed, several unlikely predictions have disappeared from the separation plot for the autocratization outcome. Moreover, the aggregate predictions now follow the observed pattern more closely, with discernible reverse waves after World War I, the latter half of the 1930s, after decolonialization in the 1960s, and after the fall of the Soviet Union in 1990. The model also predicts a reverse wave just after 1945, though, that deviates from the observed pattern. The correlation between observed and predicted net change has increased considerably relative to the internal model, from 0.257 to 0.298. In this respect, systemic shocks, while not strongly associated with democratization, do figure strongly in shaping the wave patterns that characterize political transitions.

There is one aspect of the wave behavior that cannot be evaluated on the basis of the analysis in Table 2 which only looks at *changes* to already existing political systems. To address this, Proposition 4.6 deals with new states only. New states by definition are excluded from the analysis in Table 2. In Table 4, we present the results from a model with the democracy *level* (SIP score) as the dependent variable. The analysis controls for the average SIP score globally and in the neighborhood, GDP per capita in the country, and

Table 4: Are newborn states more democratic? OLS regression of democracy *level* on standard predictors, new and old states, 1820–2008

	(1) sip2	
New country	0.0998***	(3.41)
Average SIP, globally	0.0856	(0.74)
Average SIP, neighborhood	0.477***	(7.63)
Log, centered GDP per capita, t	0.143***	(8.57)
Economic growth, t	0.00921	(0.11)
_cons	-0.903***	(-7.99)
N	11204	

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

GDP growth.[23] As expected, countries are more democratic the richer they are, and the more democratic are their neighborhoods.

Controlling for this, the analysis clearly supports Proposition 4.6: New countries (i.e., those in their first year after independence) are considerably more democratic than predicted from the other factors. The estimate is 0.098, which is approximately 10% of the range of the democracy index.

Much of the remaining wave behavior is due to the democraticness of new countries. As seen in the bottom panel in Figure 6, several new countries came into being in the 1840s, 1860s, around 1918, 1960, and 1989. These are the same years in which the change model fails to predict peaks in global democratization. When we consider the level and change models together, we have a quite complete picture of what determines the waves of democratization over the last two centuries.

6 Conclusion

While taking issue with the methodology employed by Samuel Huntington in his seminal work, *The Third Wave*, our analysis strongly supports his thesis of the existence of waves and counter-waves in democratization during the past two centuries. In providing this support for Huntington, we simultaneously raise some important reservations regarding both the methodology used and conclusions drawn by two of the most prominent critics of Huntington's wave thesis (Doorenspleet, 2000*a*, Przeworski et al., 2000).

We also provide a comprehensive, multi-faceted account of why waves occur. We identify four major sources of democratic waves, all of them partly fuelled by the gradual effect of continuous economic development over the last two centuries: First, a handful of economic crises such as the recession in the 1930s partly explain reverse waves. Second, as shown in Gleditsch and Ward (2006), the neighborhood of a country and the global context exerts a forcefull pull on the setup of its political system, resulting in a clustering of

[23]The square term for GDP per capita was not significant in this model.

changes in similar directions. The effect of such diffusion, however, is largely dependent on the 'stickiness' of institutional consistency. Institutions that are internally consistent (i.e., fully-fledged democracies or concentrated autocracies) initially prevents change, but opens up for a series of changes as soon as this consistency is broken. States with institutions that have already deviated somewhat from one of the consistent endpoints are much more susceptible to the neighborhood influences. In contrast, consistent regimes such as Israel or North Korea can maintain their institutions even when very different from their neighbors. Fourth, newly formed states tend to be more democratic than otherwise similar states. Systemic shocks such as the two World Wars, decolonialization in the 1960s, and the fall of the Soviet Union both opened up for change in existing countries and led to the emergence of new countries. Such clustered formation of states gives rise to clustered increases in global democracy. Finally, we also find that the institutional setups of new democracies tend to some extent to be non-sustainable. The global surges in democratization following systemic shocks, then, tend to be followed by subsequent reverse waves.

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APPENDIX

Table A-1: Multinomial logit model results, four equilibrium models, 1816–2008, change defined as at least 0.10 on the SIP scale

	Baseline	Economic	Diffusion	Internal	System shock
Autocratization					
Log, centered GDP per capita, t–1		-0.750***	-0.620***	-0.465***	-0.475***
		(-5.04)	(-4.04)	(-3.42)	(-3.56)
Log GDP per capita squared		-0.183	-0.190	-0.0931	-0.0825
		(-1.57)	(-1.63)	(-0.84)	(-0.78)
Economic growth, t–1		-3.121	-3.261	-3.097*	-2.322
		(-1.84)	(-1.89)	(-2.00)	(-1.58)
Global SIP pull			1.349**	1.712*	2.064*
			(2.88)	(2.07)	(2.34)
Neighborhood SIP pull			-2.211***	-1.971***	-1.921***
			(-4.78)	(-4.44)	(-4.42)
Change in neighborhood			1.589	1.113	1.089
			(1.62)	(1.17)	(1.28)
SIP score, t–1				2.274**	3.001***
				(2.70)	(3.31)
SIP score squared, t–1				-6.511***	-7.809***
				(-4.77)	(-5.81)
Brevity of polity, $\alpha = 16$				0.813	0.637
				(0.92)	(0.74)
Brevity of polity, $\alpha = 4$				0.536	0.455
				(0.89)	(0.75)
Systemic war					0.272
					(1.65)
Systemic alliance shift					-0.0134
					(-0.03)
Systemic state creation					0.131***
					(3.32)
Proximity of war loss					0.831
					(1.04)
Proximity of alliance change					0.536*
					(1.98)
Proximity of independence					0.859
					(1.87)
Lower end	-17.21***	-16.87***	-17.58***	-16.05***	-15.30***
	(-81.34)	(-79.16)	(-75.52)	(-45.53)	(-44.11)
Constant	-3.485***	-3.508***	-3.675***	-4.076***	-4.288***
	(-28.27)	(-22.18)	(-22.40)	(-8.75)	(-9.36)
Democratization					
Log, centered GDP per capita, t–1		0.0331	0.133	0.102	0.106
		(0.33)	(1.28)	(1.01)	(1.05)
Log GDP per capita squared		-0.127	-0.141	-0.0788	-0.0700
		(-1.71)	(-1.75)	(-1.06)	(-0.92)
Economic growth, t–1		-3.421***	-3.370***	-3.280***	-3.196***
		(-3.51)	(-3.41)	(-4.03)	(-3.93)
Global SIP pull			0.852*	2.640***	2.795***
			(2.28)	(4.61)	(4.37)
Neighborhood SIP pull			0.979**	1.250***	1.271***
			(2.67)	(3.76)	(3.92)
Change in neighborhood			0.515	0.195	0.134
			(0.45)	(0.15)	(0.10)
SIP score, t–1				2.083***	2.282***
				(3.73)	(3.64)
SIP score squared, t–1				-5.712***	-5.841***
				(-5.04)	(-5.09)
Brevity of polity, $\alpha = 16$				0.0213	-0.0133
				(0.04)	(-0.02)
Brevity of polity, $\alpha = 4$				0.739	0.749
				(1.51)	(1.53)
Systemic war					0.0399
					(0.25)
Systemic alliance shift					0.509
					(1.20)
Systemic state creation					0.0181
					(0.62)
Proximity of war loss					-0.0106
					(-0.01)
Proximity of alliance change					-0.231
					(-0.66)
Proximity of independence					-0.121
					(-0.21)
Upper end	-17.12***	-16.43***	-16.73***	-15.47***	-15.00***
	(-83.38)	(-63.19)	(-54.71)	(-42.19)	(-40.46)
Constant	-3.246***	-3.081***	-3.226***	-3.128***	-3.241***
	(-37.43)	(-26.68)	(-25.31)	(-10.52)	(-9.93)
N	7826	7826	7826	7826	7826
log likelihood	-1780.6	-1738.2	-1695.7	-1628.5	-1614.3

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A-2: Multinomial logit model results, four equilibrium models, 1816–2008, change defined as at least 0.20 on the SIP scale

	(1) Baseline	(2) Economic	(3) Diffusion	(4) Internal	(5) System shock
Autocratization					
Log, centered GDP per capita, t–1		-0.794***	-0.844***	-0.604**	-0.636**
		(-4.38)	(-4.00)	(-3.01)	(-3.15)
Log GDP per capita squared		-0.273*	-0.229	-0.110	-0.0731
		(-2.16)	(-1.78)	(-0.82)	(-0.58)
Economic growth, t–1		-2.473	-2.654	-2.508	-1.621
		(-1.24)	(-1.22)	(-1.35)	(-0.95)
Global SIP pull			-0.330	0.307	0.470
			(-0.52)	(0.29)	(0.44)
Neighborhood SIP pull			-1.807**	-1.461*	-1.372*
			(-2.86)	(-2.51)	(-2.39)
Change in neighborhood			0.629	-0.0514	-0.0631
			(0.90)	(-0.08)	(-0.09)
SIP score, t–1				4.722***	5.269***
				(4.07)	(4.37)
SIP score squared, t–1				-10.63***	-11.78***
				(-5.38)	(-5.91)
Brevity of polity, $\alpha = 16$				0.473	0.325
				(0.41)	(0.29)
Brevity of polity, $\alpha = 4$				1.061	0.978
				(1.37)	(1.25)
Systemic war					0.210
					(1.10)
Systemic alliance shift					0.410
					(0.70)
Systemic state creation					0.150**
					(2.88)
Proximity of war loss					1.503
					(1.74)
Proximity of alliance change					0.641
					(1.90)
Proximity of independence					0.420
					(0.75)
Lower end	-17.19***	-16.83***	-16.91***	-13.81***	-16.32***
	(-75.15)	(-73.44)	(-61.60)	(-21.70)	(-26.70)
Constant	-3.976***	-3.959***	-4.414***	-4.838***	-5.211***
	(-27.71)	(-20.41)	(-18.08)	(-7.66)	(-8.77)
Democratization					
Log, centered GDP per capita, t–1		0.0240	0.172	0.150	0.167
		(0.16)	(1.03)	(0.90)	(1.03)
Log GDP per capita squared		-0.129	-0.120	-0.0581	-0.0245
		(-1.21)	(-1.02)	(-0.52)	(-0.21)
Economic growth, t–1		-3.109*	-3.049*	-2.941**	-2.594*
		(-2.35)	(-2.47)	(-2.77)	(-2.30)
Global SIP pull			1.248**	2.735***	2.897***
			(2.58)	(3.37)	(3.55)
Neighborhood SIP pull			1.800***	2.017***	2.093***
			(3.79)	(4.47)	(4.70)
Change in neighborhood			1.229	1.195	1.051
			(1.02)	(0.93)	(0.81)
SIP score, t–1				1.349	1.617*
				(1.78)	(2.04)
SIP score squared, t–1				-6.517***	-6.917***
				(-4.10)	(-4.22)
Brevity of polity, $\alpha = 16$				-0.323	-0.314
				(-0.42)	(-0.39)
Brevity of polity, $\alpha = 4$				1.174*	1.195
				(1.96)	(1.95)
Systemic war					0.108
					(0.57)
Systemic alliance shift					0.541
					(0.96)
Systemic state creation					0.0963**
					(2.93)
Proximity of war loss					0.773
					(0.93)
Proximity of alliance change					-0.458
					(-1.26)
Proximity of independence					-1.368
					(-1.55)
Upper end	-17.10***	-16.38***	-16.15***	-14.33***	-17.07***
	(-79.67)	(-53.10)	(-39.93)	(-27.45)	(-31.90)
Constant	-3.908***	-3.750***	-4.140***	-3.988***	-4.215***
	(-36.48)	(-25.08)	(-22.47)	(-9.75)	(-9.49)
N	7826	7826	7826	7826	7826
log likelihood	-1149.8	-1124.4	-1069.6	-1012.9	-996.3

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$