Signaling Democratic Progress Through Electoral System Reform in Post-Communist States

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Signaling Democratic Progress Through Electoral System Reform in Post-Communist States[1]

Abstract

The international community invests heavily in democracy promotion, but these efforts sometimes embolden leaders not interested in true democratic reform. We develop and test a formal model explaining why this occurs in the context of electoral system reform --- one of the most important signals of democratic quality. Our formal model characterizes leaders as either truly reform minded or pseudo-reformers, those who increase electoral system proportionality in order to receive international community benefits while engaging in electoral fraud. We hypothesize that the international community will be more (less) likely to detect fraud when leaders decrease (increase) proportionality, regardless of whether there is evidence of numerical fraud. Using a mixed-methods approach with cross-national and case study data from post-Communist states, we find that the international community is generally less likely to detect fraud following an increase in proportionality and vice versa. We suggest that democracy promoters over-reward perceived democratic progress such that pseudo-reformers often benefit.

Keywords: proportionality, electoral fraud, electoral system reform, democracy promotion, post-Communist states
(9,997 words)

1. Introduction

Democratic governments and non-governmental organizations spend billions of dollars each year promoting democracy in developing nations. Despite the time, energy, and money that the international community pours into democracy promotion, these efforts have produced mixed results (e.g., Goldsmith, 2008). Indeed, scholars have identified cases where democracy promotion results in unintended consequences that enable recipient country leaders to obtain benefits from the international community without making serious democratic progress (e.g., Asunka et al., 2019). How and why do these unintended consequences come about? We develop and test the predictions of a formal model that captures the conditions under which democracy promotion results in no true democratic progress.

While the international community invests in a wide range of democracy promotion strategies, elections are of particular interest (Carothers, 2009), as substantial democratization of the electoral process enables the development of strong opposition parties, helping to ensure long-term political change. We focus on reforms that change the proportionality of electoral systems. Such reforms are visible to members of the international community: changing electoral rules typically involves a constitutional amendment, legislative approval, or executive order. More importantly, proportionality reforms are common. Crisp and Cunha Silva (2020) show that between 1980 and 2018, Latin American countries reformed their electoral systems 44 times.

The international community has long backed reform efforts to increase electoral system proportionality and seemingly places weight on whether country leaders do so (e.g., Tomini, 2014). Leaders perceived as democratizing stand to gain from international organizations who

value democracy promotion. Even weak signs of democratic progress — like institutional rules changes — can generate increased international goodwill, favorable electoral observation reports, and foreign aid (Dimitrova and Pridham, 2004; von Soest, 2015). Perceived electoral progress may also help compensate for democratic backsliding in other areas, giving country leaders cover to engage in other activities that preserve their power.

Democracy promoters focus on increasing proportionality as a way to increase electoral competition and to reduce electoral fraud. As the United Nations directive on electoral system design and reform states, though electoral systems do not determine levels of democracy, increasing electoral system proportionality is a priority (UN, 2013). Increasing electoral system proportionality can embolden political opposition (e.g., Birch, 2005), just as decreasing proportionality can provide incentives for committing electoral fraud (e.g., Klein and Moraski, 2019). In these cases, the proportionality of the electoral system is thought to directly influence the nature of political competition.

We argue that pressures and incentives from the international community push some leaders to change electoral system proportionality in order to appear democratic while continuing to engage in electoral fraud. Previous work has shown that leaders strategically alter their electoral systems in response to internal pressures (e.g., Bielasiak and Hulsey, 2013). In the international context, a leader's choice to make an electoral system more proportional is a signal of election quality to the international community. Increased proportionality is thought to increase political competition and to reduce the potential for engaging in electoral fraud (Birch, 2007). The fact that many countries begin their transitions to democracy by adopting more proportional electoral rules means that

country leaders interested in continuing to commit electoral fraud may be able to adopt more proportional electoral rules hoping to be mistaken for a leader interested in democratic reforms. In this way, the international community's decision to declare elections fraudulent is influenced by changes in electoral system proportionality that the international community believes signal fraud levels.

We develop a formal model to describe the incentives country leaders have to change the proportionality of their electoral systems to curry favor with the international community. Our model involves two types of country leaders: true reformers, who change the proportionality of their electoral system to make democratic progress, and pseudo-reformers, who take steps toward electoral reform only to reap the benefits provided by the international community. While it is possible for the international community to set incentives such that only true reformers make their electoral systems more proportional, the model suggests that the most likely outcome is that the international community over-rewards increased electoral system proportionality, thereby incentivizing pseudo-reformers to make their electoral systems more proportional without actually reducing electoral fraud.

We test this argument in the post-Communist context, where electoral reform is especially prevalent. Our cross-national analysis shows that decreasing electoral system proportionality is associated with international organizations proclaiming that fraud has increased, but that increasing electoral system proportionality is not associated with decreased fraud proclamations. We then draw on evidence from Ukraine suggesting that changing electoral system proportionality does not change evidence of numerical fraud, but that increasing proportionality acts as a signal of

increased democratic quality that prompts international organizations to proclaim that fraud has been reduced. Similarly, decreasing proportionality signals decreased democratic quality and results in increased proclamations of fraud. Our paper is the first to model the ways in which country leaders and the international community use proportionality as a democratic signal and to empirically demonstrate the impact proportionality has on declarations of fraud. More broadly, we theorize about how unexpected consequences of democracy promotion occur, and we suggest that the international community reduce the value it places on democracy promotion in order to reduce the desire for country leaders to take advantage of international benefits without making any democratic progress.

2. Signaling Democratic Progress

We develop a formal model that uses electoral system proportionality as a signal to the international community (IC) about the country leader's status as a true or pseudo-reformer. This relationship is complex; formal models allow us to precisely identify key choices that country leaders and the IC make that influence the final outcome. Our model describes the conditions under which changes to electoral system proportionality are a reliable signal about the democratic intentions of the country leader and provides policy recommendations to the IC about how to best calibrate their response when they observe changes in proportionality. Our model is designed to be generally applicable to many forms of developing democracies, though we focus on testing the empirical implications of our argument in post-Communist countries.

The model has two actors: a country leader and the international community. For the purposes of the model, we follow Grimm (2019) and treat the country leader and the international community

as unitary actors in a dynamic relationship with one another.[2] This is plausible because electoral reforms require the support of the incumbent government in order to be enacted. Further, while intra-country dynamics are important, they are far from uniform across countries; the simplicity of our model focuses on the interaction between the incumbent government and the international community. The international community acts through supra-national organizations, particularly the European Union (EU), the World Bank, and the Organization for Security and Cooperation in Europe (OSCE); the actions modeled here are decisions from these organizations as a result of their voting and policy-making procedures.

2.1 Stages

In stage 1, Nature assigns a leader to be either a "true reformer," T, or a "pseudo-reformer," P, with prior beliefs $T = \alpha$ and $P = 1 - \alpha$, for $\alpha \in [0,1]$. This distinction captures differing motivations for changing electoral system proportionality. While type T leaders engage in electoral system reform out of an intrinsic desire to reduce electoral fraud and to improve the quality of their country's democracy, type P leaders wish only to appear like true reformers to gain IC benefits. The leader knows her type, but the IC does not. The IC can learn information about the leader's type by observing the proportionality of the electoral system that the leader chooses.

In stage 2, the leader selects more proportional (MP) electoral rules, less proportional (LP) electoral rules, or no electoral rules changes for a given election. Note here that our theory is not limited to electoral system reform (i.e., proportional, majoritarian, or mixed systems); there are many electoral rule changes that influence electoral system proportionality, such as thresholds and

magnitude. After selecting a level of proportionality, the choice is revealed to the IC. If the leader

selects no electoral rules changes, the game ends and neither the leader nor the IC receive payoffs.

In stage 3, the IC, knowing the leader's proportionality choice, decides whether to monitor M the

election or not U. Here we assume that the IC has been invited to monitor the election by the leader

since Hyde's (2011) model shows that inviting election monitors is an almost universally accepted

pooling equilibrium. The IC monitors many elections, so we can also think of this choice as

whether to monitor an election with high or low intensity, where high intensity monitoring is

clearly more costly for the IC. Only high intensity monitoring is precise enough for the IC to

develop conclusions regarding the quality of elections.

In stage 4, the leader observes the selected level of IC monitoring (which is announced ahead of

time, see Asunka et al., 2019) and decides whether to engage in electoral fraud or not.[3] To simplify

the model, we assume that type T leaders never engage in electoral fraud and type P leaders always

engage in fraud. The IC catches fraud C with some probability $\varepsilon \in [0, 1]$ and fails to catch fraud

N with probability $1 - \varepsilon$. Fraud is only punished if it is caught.

Based on the IC's knowledge of the proportionality of the electoral system chosen and its

perceptions about whether fraud occurred, the IC updates its beliefs about the leader's type using

Bayes' Rule.

2.2 Payoffs

The payoff structure takes into account dynamics at play in electoral competition in developing democracies. Depending on their level of proportionality, electoral systems generate different incentives to commit fraud. We follow Birch (2007) in arguing that it is more efficient to commit electoral fraud in less proportional systems because candidates need to modify fewer votes to win an election in a less proportional system compared to a more proportional system. Votes are also more geographically concentrated in LP systems, which helps candidates win by relying on local patronage networks (Collins, 2006). Additionally, LP systems have higher stakes because a defeat in a LP system usually results in no representation, whereas a defeat in a MP system can still result in winning some seats (Lehoucq, 2003). These higher stakes mean that incumbents competing under LP rules are especially willing to rely on electoral fraud when facing strong competition (Ruiz-Rufino, 2018). Taken together, it is both easier and more effective for candidates to commit fraud in LP electoral systems compared to MP systems. This is not to say that LP systems have no within-country costs. For example, parties in single-member-district systems have to organize a larger number of small campaigns compared to parties in closed list proportional representation systems. We claim that LP elections have inherent within-country electoral benefits for leaders, $B > 0$, that outweigh these costs.

The leader receives a bonus from the IC when elections are monitored and no fraud is revealed. At the same time, we argue that electoral system proportionality functions as a heuristic to inform the IC about the probability that electoral fraud has occurred. The IC knows that it is easier for country leaders to commit electoral fraud in less proportional electoral systems. This means that the IC is more suspicious that fraud occurs in less proportional electoral systems and is more willing to declare an election clean in more proportional electoral systems (e.g, Blais, Dobrzynska, and

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Indridason, 2005; Nikolenyi, 2011). As such, the IC is more likely to deliver a bonus, $A > 0$, for running a clean election when the country leader chooses a more proportional electoral system because fraud is rarer in more proportional electoral systems.

Type P leaders receive a cheating bonus of $G > 0$ because they engage in fraud. However, if monitoring occurs and reveals the fraud, the leader is punished $D > 0$. Punishment comes in the form of admonishment from the international community and decreased willingness to provide benefits to the country and the country leader (e.g., Roussias and Ruiz-Rufino, 2018). Detecting fraud also makes it more difficult for leaders to engage in the same kind of fraud in the future, meaning that leaders need to resort to more complicated and costly methods of committing fraud (Simpser and Donno, 2012). Type T leaders never receive the fraud bonus or are penalized for engaging in fraud. Undergoing any form of monitoring costs all leaders $Y > 0$ because leaders must accommodate the needs of the election monitors (Carothers, 1997).

Democracy promotion is an international norm, meaning that IC members implicitly operate to promote democracy (McFaul, 2004). Other countries benefit when democracy increases, if not only because they believe that democratic neighbors are more peaceful (Goldsmith, 2008) or because democracy is a global public good (Burnell, 2008). We argue that the international community associates clean elections with increased democratization and uses electoral system proportionality as a signal about the likelihood that fraud occurs (Lehoucq and Kolev, 2015; Ruiz-Rufino, 2018). This means that members of the international community have incentives to push for increased electoral system proportionality as a way to reduce fraud (Bol, Pilet, and Riera, 2015).

Hence, the IC rewards itself when it encourages country leaders to adopt more proportional systems that result in clean elections. That is, the IC receives $v > 0$: 1. when the leader is T, MP is chosen, monitoring occurs, and fraud is not caught and 2. when the leader is P, LP is chosen, monitoring occurs, and fraud is caught. Without monitoring, the IC does not have enough information to update its beliefs about the leader, so it receives zero. This payoff structure is based on the legitimacy of the IC's promotion of MP systems. The argument around MP systems is predicated on the assumption that such systems reduce electoral fraud, so the IC is only successful at regulating electoral fraud when it both promotes MP systems and only finds fraud in LP systems. If LP systems lack fraud, then the IC argument promoting MP as a fraud reduction technique falls apart. The IC loses $f > 0$ for monitoring an election, which accounts for the cost of sending election monitors.

2.3 Equilibria

We focus on three equilibria: a pooling equilibrium where both leader types choose MP and the IC monitors without detecting fraud, a pooling equilibrium where both leader types choose LP and the IC monitors and detects fraud, and a separating equilibrium where T leaders choose MP and P leaders choose LP and the IC monitors and detects fraud in LP elections.[4] We assume that the IC reward for accurately identifying the leader's type is large. This is the case that most mimics reality in the international system since the IC wants to preserve some way to reward true reformers and to identify and punish pseudo-reformers.

The important parameter that determines whether a pooling or separating equilibrium occurs is B. Recall that B is the country-level benefit from having an LP system. There are three different equilibrium types along this interval. Figure 1 shows the range of B with the intervals for specific equilibria in labeled in braces.

Figure 1: Equilibria when IC Always Monitors
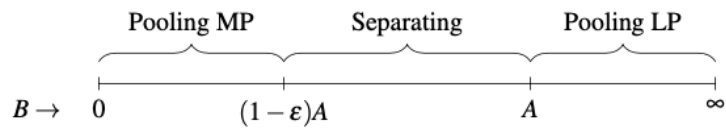
Note: Labeled braces identify the type of equilibrium in specified intervals of B given that IC the always monitors.

From $B = 0$ to $B = (1 - \varepsilon)A$, both leader types choose MP systems. LP systems do not provide enough benefit, or B, to make it worth retaining these systems. True reformer country leaders switch to more proportional systems because their absolute level of B is low, while pseudo-reformers switch to more proportional systems because their level of B is typically low enough that the incentives provided by the international community compensate for the lost benefits of retaining a less proportional system. To the international community, both of these motivations look the same because they both result in leaders choosing more proportional systems.

However, were the incentive that the international community provides to country leaders switching to more proportional systems relatively low, a separating equilibrium would be possible. When B is between $(1 - \varepsilon)A$ and A, T leaders choose MP while P leaders choose LP. Thus, the IC can perfectly distinguish leaders based on their decision to change the proportionality of their electoral system.

The separating equilibrium falls apart when $B > A$ and both types of leader pool on LP systems. In this case, the benefit of retaining a less proportional system exceeds the international community bonus for switching to a more proportional system. True reformers are likely to choose this option when they feel that their electoral system is democratic and other reforms make more sense, despite the potential international community bonus from increasing electoral system proportionality. Pseudo-reformers choose this option when doing so is the only way for them to ensure re-election or when the international community's incentive to switch to a more proportional system is low. When both true and pseudo-reformers choose less proportional systems, the international

community can only distinguish the two leader types based on their ability to detect fraud, not based on electoral system proportionality.

2.4 Empirical Implications

We assess the empirical implications of our model by examining the relationship between leader electoral system choice, reported fraud, and evidence of numerical fraud. These variables are key for determining how the international community interacts with the country leader.

Our model argues that leaders make individual-level utility calculations about the expected gains and losses from changing the proportionality of their electoral systems. The factors contributing to electoral system choice — perceived benefit from retaining a less proportional electoral system, expected amount of international community reward for choosing a more proportional electoral system, and the penalty for engaging in fraud and getting caught — are all important and are considered further in SI A. Our main focus is on the leader's ultimate electoral system choice and how the IC reacts. We believe that this interaction is the key insight of our model: the relationship between leaders and the IC when it comes to electoral system proportionality as an indicator of the probability of electoral fraud occurring has not previously been considered.

Electoral reforms are observable, and studying electoral reforms reveals benefits of retaining a less proportional system or switching to a more proportional system. Our theory predicts that there will be systematic differences in how the IC reports fraud as electoral system proportionality changes. Among our two pooling and one separating equilibria, we argue that the incentives of pseudo-

reformers in post-Communist countries are such that pooling equilibria are likely. That is, the benefits of retaining a less proportional system are rarely between $(1 - \varepsilon)A$ and A.

Though the IC wants to set-up the incentives for leaders to differentiate themselves into true and pseudo-reformers based on the proportionality of the electoral system they choose (the separating equilibrium), the IC is also worried about democratic backsliding. In other words, the IC has competing interests when thinking about declaring an election fraudulent. The purpose of declaring an election fraudulent is to try to push leaders to engage in future electoral reforms. As such, the IC takes the balance of information — changes to electoral system proportionality and on-the-ground election monitoring reports — and makes a judgement call about whether it is worth declaring elections fraudulent. The IC may be reluctant to declare elections fraudulent because recent work suggests that election monitoring could result in democratic backsliding by focusing attention only on electoral integrity while ignoring democratic declines in other areas (Gromping, 2020; Meyerrose, 2020). The pooling equilibrium suggests that, on balance, the IC hesitates to declare elections fraudulent and tends toward praise for perceived democratic progress.

Leaders in MP systems are still able to commit electoral fraud, even if it requires more effort and the results are less certain than in LP systems. Thus, it is possible that the negative impact to leaders from switching to an MP system is relatively small compared to the benefit that leaders expect to get from the international community for making this switch. As long as leaders can ensure their own re-election, pseudo-reformers have incentives to switch to an MP system in order to enjoy IC praise while still retaining power, even if committing fraud is more difficult or less effective in MP systems compared to LP systems.

Our theory predicts that the IC will declare fewer elections fraudulent in more proportional systems. This could be because all country leaders choosing more proportional electoral systems are true reformers and do not engage in fraud or because pseudo-reformers successfully convince the international community that they are true reformers by switching to a more proportional system. Based on the incentive structure outlined above, pseudo-reformers will be able to successfully increase the proportionality of their electoral system and to commit fraud without the IC declaring their elections fraudulent.

Hypothesis 1: An increase in electoral system proportionality makes the international community less likely to declare an election fraudulent.

What happens when leaders make the decision to decrease electoral system proportionality? In our pooling equilibrium, we expect that such decisions are universally condemned by the international community and that the IC is more likely to declare an election fraudulent. Pseudo-reformers who give up the prospect of receiving international community benefits from switching to a more proportional system do so because the benefits from a less proportional system are too large to be offset. These cases occur when leaders are fighting for their own survival: reduced proportionality may result in some opportunity costs, but also ensure that the leader can stay in power and reduce the influence of opposition parties and leaders. Some well-meaning true reformers may get caught up in the negative stigma associated with decreasing proportionality.

Hypothesis 2: A decrease in electoral system proportionality makes the international community more likely to declare an election fraudulent.

3. Study 1: Cross-National Analysis

We test these hypotheses in two ways: conducting a cross-national analysis in post-Communist countries followed by a case study of Ukraine. We begin our analysis using cross-national data for post-Communist countries between 1990 and 2015, covering 21 countries and 127 elections. Here, we are able to evaluate whether the IC's assessment about electoral integrity changes after modifications to proportionality.

While electoral proportionality reforms occur worldwide, we choose to focus on post-Communist countries because they have experienced many electoral reforms in a short period of time, and they share geographic and cultural similarities. Though some of these countries held elections during the Communist era, these were essentially single party elections. In these elections, countries used some variation of single-member-district systems --- simple majority or two-round (Nohlen and Stöver, 2010). After the fall of Communism, as we detail below, most post-Communist countries reformed their electoral system at least once. Some countries, such as Kyrgyzstan and Ukraine, went back and forth between more proportional and less proportional systems (see Table C8, SI C for the list of reforms)**.** Hence, the frequency and diversity of electoral system reforms make post-Communist countries an ideal case to test our hypotheses. Additionally, the EU and the OSCE --- two of the most important democracy promoters --- are interested in democracy promotion in post-Communist countries because of their geographic proximity, with the OSCE particularly focused on electoral system reform (Dimitrova and Pridham, 2004).

Our dependent variable is from the National Elections across Democracy and Autocracy (NELDA) (Hyde and Marinov, 2012). Specifically, we use the question "Were there allegations by Western monitors of significant vote-fraud?" to create *Vote Fraud*. We coded our dependent variable as "1" when Western monitors reported a significant level of vote fraud in the given election and "0" when monitors either did not report fraud or could not report with certainty the occurrence of fraud. This variable considers a wide-range of fraudulent indicators that may have occurred both before and after voting. That is, elections where monitors allege instances of vote buying and manipulation are coded as fraudulent elections.

To code our main explanatory variable, *Electoral Reform*, we collected information on the electoral system used in the elections for which we have data for both the dependent variable and the control variables.[5] We gathered data on the electoral system type (e.g., list proportional representation, first-past-the-post, et. cetera), electoral system formula for the first and second tiers (e.g., plurality, absolute majority, Hare, et. cetera), average district magnitude, and electoral threshold. We define an instance of electoral reform if at least one of these components changed between elections. In total, we detected 43 instances of reform in 18 different countries and 84 elections with no electoral reform.[6] Of the 43 reforms, we coded 30 as reforms that increased proportionality and 13 as reforms that decreased proportionality.[7] We use instances of no electoral reform as our reference category in the model.

We classified each reform according to its expected effect on proportionality. In instances where the electoral system type changed, we coded the direction of the reform using this information. To

create a rank for the electoral systems' types based on expected proportionality, we use data from

Michael Gallagher on disproportionality in elections between 1945 and 2019.[8] Then, we computed

the average index of disproportionality for each type of electoral system (Gallagher, 1991). This

index varies from 0 to 100, where 0 means a system where votes are perfectly translated into seats

(perfectly proportionality) and 100 means a completely disproportional system. Our calculations

revealed List PR as the most proportional electoral system type, whereas Two-Round is the most

disproportional system among the electoral systems used in post-Communist countries (see

complete ranking in Table C.7, SI C). Of 45 electoral system changes, 22 were coded based on

electoral system type alone.

Based on previous research that shows that, on average, small parties benefit when district

magnitude is large (Shugart and Taagepera, 1989), reforms that modified the average district

magnitude were coded based on the direction of the change. That is, a decrease (an increase) in

magnitude was coded as a reform that decreased (increased) proportionality. Similarly, because

thresholds are designed to avoid the entry of small parties into the political system (Gallagher,

2008), we consider the creation of an electoral threshold as a decrease in proportionality. Finally,

to define whether a reform in the electoral formula led to an increase or decrease in proportionality,

we relied on Benoit's (2000) simulation study of electoral formulas.[9] Of the 21 reforms not coded

based on electoral system type, 13 were coded based on average district magnitude, three on

electoral formula, three on formula and district magnitude, one on magnitude and threshold, and

one on threshold, electoral formula, and district magnitude.[10]

To evaluate whether electoral reform is associated with reports of *Vote Fraud*, we use a logistic regression model with random effects by country. Our model includes a series of covariates that are likely related to the ability to commit and to detect fraud and factors that previous studies have identified as predictors of fraud (Lehoucq, 2003). In terms of the former, we account for the election management body (EMB) capacity and autonomy (Coppedge et al., 2020). Given that leaders who want to commit fraud will likely decrease the capacity and autonomy of EMB, we believe that these variables will be negatively correlated with *Vote Fraud*. Second, we include Polity 2 (Marshall and Gurr, 2020) and government censorship effort (Coppedge et al., 2020) to control for the fact that vote fraud is likely more common in less democratic and free countries. We also control for GDP per capita (Bolt et al., 2018), ethnic fractionalization (Drazanova, 2019), whether the country is or has been accepted to be a member of European Union,[11] Oil Rents (% of GDP) (WDI, 2020), and urbanization (WDI, 2020).[12]

3.1 Results

Figure 2 presents our findings. Table C.1 in SI C has the complete results. The figure shows the difference in predicted probability for reporting *Vote Fraud* when we hold all covariates at their means and vary the value assumed by *Electoral Reform*.

Figure 2: Change in Predicted Probability of Reporting Vote Fraud
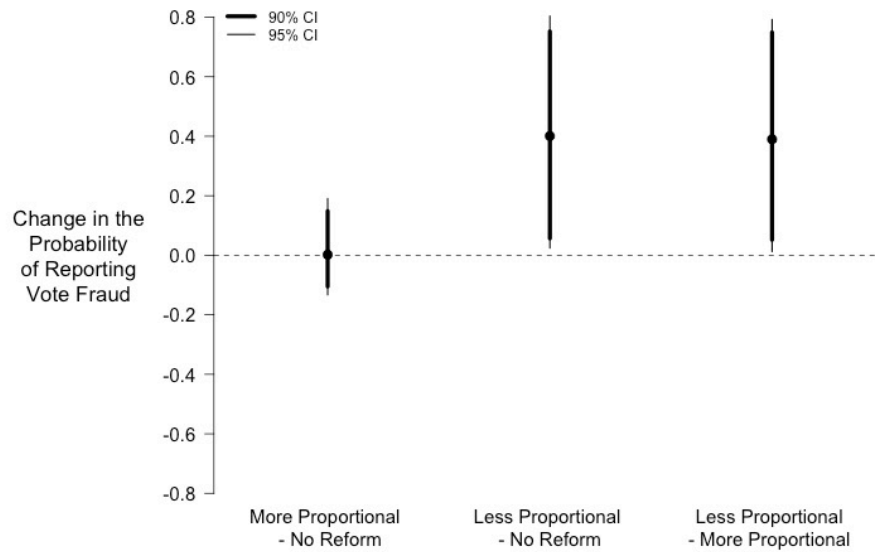
Note: Change in probabilities calculated using the estimates from the model in Table C.1 in SI C. 90% and 95% Credible intervals. All covariates are held at their means.

The estimates in Figure 2 indicate that there is no statistically significant difference in the probability that the IC will declare an election fraudulent after a reform that increased proportionality compared to when the country did not reform its electoral rules. However, the IC is significantly more likely to declare an election fraudulent when leaders decrease the system's proportionality. The probability of reporting fraud is 40% and 38% larger after a reform that decreased proportionality compared to instances of no reform or a reform that increased proportionality, respectively. Though this analysis does not offer support to H1, the findings in this study show that the IC is more likely to punish leaders who reform their country's electoral system to decrease proportionality (H2).

4. Study 2: Ukrainian Electoral Reforms and Fraud

We conduct a case study in Ukraine to supplement the results from our cross-national analysis and to more precisely test the empirical implications of our model. Ukraine is an ideal case study because it has undergone frequent, highly visible electoral reforms, both increasing and decreasing proportionality (Casier, 2011). Ukraine has also been broadly studied by scholars interested in election integrity and administration (Herron, 2015) and has reported precinct-level results since the 2002 elections. Since 1991, Ukraine has altered its electoral system frequently, moving from a Two-Round system (TR) to a Mixed Member Independent (Parallel) system (MMI), a fully PR system, and back to a MMI system. Full details on the motivations behind Ukrainian electoral reforms are in SI E.

Following our model, we expect declarations of fraudulent elections by international monitors — i.e., the international community — to become less (more) likely after a modification to the

electoral system that increases (decreases) its proportionality, even if evidence of numerical fraud does not change. Our analysis uses forensic methods to evaluate vote tallies. We recognize that the international community may also be concerned with types of fraud, however, fair vote counting is an essential component of an election. Evidence of fraud in the vote counting stage of an election considered as fair by the IC indicates that pseudo-reformers are able to get away with conducting fraud without the IC declaring the election fraudulent.

4.1 Data and Methods

Precinct level electoral data in Ukraine are available for elections since 2002.[13] Our data cover six elections and two of the three large electoral reforms. Using these data, we conduct a series of forensic tests to determine if there is evidence of numerical fraud and compare these results to election monitoring reports.[14]

Two factors are key in digit-tests for fraud detection. First, humans are biased when creating numbers, meaning that they are unable to produce truly random numbers. For example, when creating numbers, individuals favor those that contain pairs of adjacent numbers and avoid pairs of distant numerals (Beber and Scacco, 2012). Second, digit-tests exploit the fact that the distribution of digits is not random. Some numerals have a higher probability of occurring at a given digit of a number than others (Benford, 1938). As an example, the digit "1" is 30% more likely to be the first digit of a number than the digit "2."

Although studies in the area of electoral forensics show that the distribution of first digits in vote counts does not follow Benford's Law (Pericchi and Torres, 2011), scholars utilize this same logic to evaluate the distribution of the second-digit (2bl) of electoral returns and turnout. In a fraudulent

election, the distribution of 2bl should deviate from the one proposed by Benford's Law (Mebane Jr., 2008; Pericchi and Torres, 2011). Using the expected distribution in Table B.1 (SI B), we conduct a chi-squared test comparing our observed distribution of digits to the expected distribution. Additionally, we run a t-test of means in which we compare the estimated mean in our distribution to the expected value of the theoretical distribution (4.187).

Because techniques based on the Benford's Law sometimes produce unreliable results (Deckert, Myagkov, and Ordeshook, 2011), we also utilize two additional digit-based tests. Specifically, we evaluate deviations in the distribution and the average value of the last digit. In the absence of fraud, the distribution of the last digit in electoral returns of a given party should follow a uniform distribution (Beber and Scacco, 2012). Numbers from 0 to 9 should appear as the last digit with the same probability ($Pr = 0.1$); a statistically significant deviation from this pattern can be considered evidence of fraud. Similar to our analysis for the 2bl, we perform two tests. First, we use a chi-squared test to check if the distribution of last digits diverges from the expected distribution. Then, we run a t-test to verify if the average observed value for the last digit is different from the expected value (4.5).

We also examine the vote share distribution to determine whether it deviates from theoretical expectations. Our first test is based on the observation that the vote share distribution in a clean election is single-peaked (Myagkov, Ordeshook, and Shakin, 2009), whereas the distribution in fraudulent elections is multimodal. To evaluate whether the distribution is unimodal, we use the Dip Test of unimodality (Hartigan and Hartigan, 1985). Second, we analyze whether the vote share distribution is similar to the normal distribution. Klimek et al. (2012) show that the vote share

distribution in fraudulent elections has skewness and kurtosis different from the normal distribution. Consequently, in clean elections, the distribution should have kurtosis and skewness equal to 3 and 0, respectively.

Even though our use of multiple forensic tests is in line with the best practices (Hicken and Mebane Jr, 2017), the previous techniques rely on statistical hypothesis tests that are sensitive to sample size and false-positive results (Medzihorsky, 2015; Venice Commission, 2018). We utilize Bonferroni (1936) corrected p-values to account for the fact we are conducting multiple statistical tests using the same sample. We also employ Medzihorsky's (2015) method of latent-class digit analysis which is not based on statistical tests and is not affected by sample size. The method measures "how much fraud there was" (Medzihorsky, 2015, 511) by decomposing the distribution of last digit numerals into "no fraud" and "fraud" classes. The "fraud" category is captured by two fit statistics π^* and Δ, which represent the percentage "of the inspected digits that cannot be described as free of fraud" and "of digits that would need to be changed to their presumed original values in order to observe the distribution thought to characterize the absence of fraud" (Medzihorsky, 2015, 509-510). As a result, low values in these statistics signal low evidence of numerical fraud in a given election.[15]

4.2 Results

Table 1 synthesizes the results from our forensic analysis for the electoral returns of the presidential party or the party that was in the presidency when the reform was approved.[16] We examine the winner and runner-up parties' electoral gains and turnout in SI B finding consistent results.

Table 1: Forensic Analysis for the Electoral Returns of the Presidential Party's or Party that Initiated the Reform— Ukrainian Legislative Elections, 2002-19

	For United Ukraine* (CLPR Tier, 2002)	Party of Regions* (List PR, 2006)	Our Ukraine* (List PR, 2007)	Party of Regions (FPTP Tier, 2012)	Party of Regions (CLPR Tier, 2012)
t-test (Last Digit)	0.000	0.000	0.000	0.000	0.000
t-test (2bl)	0.000	0.020	0.000	0.084	0.155
Chi-square (Last Digit)	0.000	0.000	0.000	0.000	0.000
Chi-square (2bl)	0.000	0.039	0.001	0.383	0.440
Dip Test	0.992	0.000	0.000	0.000	0.550
Skewness	0.000	0.000	0.000	0.000	0.000
Kurtosis	0.000	0.000	0.000	0.000	0.000
N of Positive Tests	6	5	7	5	4
π^*	10.00	6.78	6.76	7.47	6.29
Δ	2.19	1.67	1.70	1.53	1.35
N	28,025	28,569	30,578	24,437	32,526
NELDA	Systematic Fraud	No Systematic Fraud	No Systematic Fraud	Systematic Fraud	

	Petro Poroshenko Bloc (FPTP Tier, 2014)	Petro Poroshenko Bloc (CLPR Tier, 2014	Servant of the People (FPTP Tier, 2019)	Servant of the People (CLPR Tier, 2019)
t-test (Last Digit)	0.000	0.002	0.000	0.433
t-test (2bl)	0.180	0.454	0.482	0.001
Chi-square (Last Digit)	0.006	0.054	0.000	0.537
Chi-square (2bl)	0.368	0.128	0.293	0.022
Dip Test	0.991	0.887	0.164	0.597
Skewness	0.000	0.000	0.000	0.000
Kurtosis	0.000	0.000	0.000	0.000
N of Positive Tests	4	3	4	3
π^*	5.58	4.27	5.01	3.10
Δ	1.40	0.98	1.68	0.66
N	19,351	28,374	27,720	29,113
NELDA	No Systematic Fraud		---	

Notes: Bonferroni corrected p-values. *Largest parties in presidential coalition.

Each cell in the first seven rows of Table 1 contains the *p-value* for our seven tests. The eighth row indicates the total number of tests in which we detected evidence of vote fraud ($p < 0.05/7$, Bonferroni corrected *p-value*). Note that the number of statistically significant tests does not indicate the magnitude of fraud. The number of positive tests, however, informs about the possibility of fraud. As pointed out by Hicken and Mebane Jr. (2017, 7), "patterns in data that typically result from such [numerical] manipulation […] are more likely to represent evidence of fraud, if found consistently across multiple statistical techniques."[17] The next two rows contain the residual classes π^* and Δ. As mentioned previously, these statistics capture the share of numerals that would need to be removed and changed, respectively, to find an accurate distribution. Next, we report the number of precincts in the sample. The last row shows the international community's assessment of the election — whether the election was declared fraudulent or not — based on NELDA (Hyde and Marinov, 2012). We use NELDA because IC reports usually do not include an explicit assessment of the election. NELDA codes elections as fair if Western monitors did not report a significant amount of vote fraud. NELDA does not have data for the 2019 election, so we rely on IC reports for this election.

Although we do not have data for elections before 2002, it is worth mentioning NELDA and IC assessments of these elections in order to understand how election fraud reports have changed over time. NELDA considered the 1994 election to be unfair. According to Birch (1998), this election was an extension of the unfair practices used during Soviet rule. Though the OSCE did not issue an election report for 1994, the IRI (1994, 4) found that the elections were a "missed opportunity to advance significantly the institutions and practices indicative of a democracy." It is noteworthy

that the IRI's report emphasized the electoral law, especially the lack of proportional representation, as the origin of the issues in the election (IRI, 1994, 4).

Even after the change to the MMI system --- increasing proportionality, NELDA categorized the 1998 elections as unfair. The OSCE (1998) reported that 58% of its monitors observed open voting. Moreover, unauthorized persons, such as police and local officials, were seen in 14% of the monitored polling stations (OSCE, 1998). Similarly, scholars concluded that despite the change to MMI system no significant progress was made (Wilson and Birch, 1999).

NELDA's assessment of the 2002 elections, the first ones for which we have data, were still negative. The OSCE (2002)'s report for this election described instances in which vote secrecy was likely violated. Specifically, the OSCE mentioned that authorities pressured public employees to vote for specific candidates (OSCE, 2002, 2). Though we do not have data for elections before 2002, Table 1 shows that two subsequent elections were not very different from the 2002 elections in terms of the likelihood of fraud. Six of our tests were statistically significant for the 2002 elections and 2007 elections and five were significant for the 2006 elections. Moreover, we observe the largest value for π^* and Δ in the 2002 elections, 10% and 2.19%, indicating evidence of numerical fraud in the electoral returns for For United Ukraine in the CLPR tier. Our results are unsurprising given President Kuchma's ability to retain the MMI system. President Kuchma vetoed two reforms that would have increased the proportionality of the system (Birch, 2003). Parties believed that this obstruction was motivated by the fact that electoral manipulation would be easier in an MMI system than in a pure PR system (Birch, 2003, 525).

NELDA considered the 2006 elections to be free of systematic fraud, following the adoption of CLPR. The IC's assessment after the 2006 elections was that they were largely in line with international standards, with the IRI stating that "dramatic improvement" occurred (IRI, 2006, 3). Likewise, the OSCE concluded that "progress in the electoral process […] was further consolidated" (OSCE, 2006, 1).[18] Nevertheless, five of our tests indicate numerical fraud in the electoral returns of Party of Regions, the largest party in the former president Kuchma's coalition. Both the IC's assessment and our fraud detection tests for the 2007 elections are similar to those for 2006. Despite the fact that all seven tests indicate numerical fraud in the 2007 elections, NELDA considered this election to be free of systematic fraud, and the OSCE report states that "the elections were conducted mostly in line with…international standards for democratic elections" (OSCE, 2007, 1). Although we observe smaller values for π^* and Δ in the 2006 and 2007 elections when compared to the 2002 elections, these values are similar to those observed in the 2012 elections when the IC reported systematic fraud. As an example of the impact of the disconnect between numerical fraud and the IC's assessment of fraud, both the US and the EU increased foreign aid allocations in this period specifically because they determined that democratic reforms were taking place (Shapovalova, 2010).

International praise came to an end in the 2012 election with the return of the MMI system and a decrease in proportionality. NELDA considered this election to be unfair. The OSCE (2012) found that elections were conducted in a less fair manner than before and that the new electoral system was not implemented as written (BBC, 2012). Similarly, the Electoral Integrity Project rated these elections as having "very low integrity" (Norris, Frank, and Martinez i Coma, 2014). The change from CLPR to MMI helped the ruling party engage in election malpractice by enabling competition

suppression (over-crowding the elections with clone candidates and proxy parties), manipulation of the electoral commission, and delays in publishing the results (Kovalov, 2014). Using the data for the FPTP tier, we find that 5 of our tests are statistically significant, whereas we detect numerical fraud in 4 of our tests for the CLPR tier. The estimated shares of numerals needed to be changed or removed to make the distribution accurate are similar to those estimated for the two previous elections that were considered free of systematic fraud by the IC.

By 2014, observer reports praised some improvements when compared to the 2012 election. The Electoral Integrity Project, for example, changed its grade for Ukraine from "very low integrity" to "moderate integrity." Similarly, observers from the IRI congratulated the country for an "election that met international standards," saying that the election was a sharp contrast from the previous contest (Interfax-Ukraine, 2014).[19] This praise is reflected in NELDA's assessment, which considered this election free of systematic fraud. Our results in Table 1 indicate that four (in the FPTP tier) and three (in the CLPR tier) of the fraud detection tests were statistically significant. We also observe low values for π^* and Δ in this election. Nevertheless, both the statistical tests and the estimated numerical fraud are fairly similar to those in 2012. In line with our findings, Herron (2015) uses survey evidence to conclude that the performance of parties and candidates was better in precincts controlled by their allies. Consequently, although NELDA and the IC assessed this election to be fair, the evidence of fraud in this election is similar to previous elections that, according to these organizations, suffered systematic fraud.

Even though we do not have data from NELDA for the 2019 election, international organizations noted that, overall, the early parliamentary elections of 2019 followed international standards.

Nevertheless, numerous malpractices occurred, especially in the FPTP tier (OSCE, 2019, 30). Contrary to the OSCE evaluation, Table 1 shows that the number of positive tests in this election was exactly equal to those observed in the 2014 election. Our estimates for the magnitude of fraud indicate that numerical fraud was less systematic in the electoral returns for the presidential party in this election than in the other analyzed elections.

The findings match our theoretical expectations. Although the assessment of Ukrainian elections did not change after the adoption of MMI, both NELDA and the IC's assessments of Ukrainian elections improved after the change to CLPR that increased proportionality and worsened after a reform that decreased proportionality. NELDA and the IC praised the elections shortly after the adoption of CLPR in 2006 (replacing the MMI system), whereas they criticized the 2012 elections after the replacement of the CLPR system by the MMI. All of these changes occurred despite the fact that we consistently detect evidence of numerical fraud in electoral returns of the presidential party or party that initiated the reform.[20]

5. Discussion and Conclusion

Our results from both the cross-national and case study analysis suggest that the international community is more likely to declare an election fraudulent when country leaders decrease the proportionality of their electoral systems, regardless of whether there is evidence of numerical fraud. We find similar evidence in our case study for the impact of increasing proportionality on decreased fraud claims, though this finding deserves to be investigated further to determine whether rewarding increased proportionality operates differently outside of the Ukraine context.

Fraud declarations are important: if the international community declares an election to be free and fair, then the country leader can expect to receive substantial international community benefits. While foreign aid is partly determined by geopolitical factors, citizens from donor countries have strong preferences about foreign aid flows that influence actual aid allocation. Citizens tend to disapprove of foreign aid allocations to countries perceived as non-democratic (Doherty et al., 2020), specifically including countries who experience substantial electoral fraud (Heinrich and Kobayashi, 2020). Further, even absent citizen pressure, donor agencies are less likely to provide foreign aid to countries with high levels of electoral fraud (Swedlund, 2017). Thus, the willingness on the part of the international community to use electoral system reform as a heuristic for electoral fraud can have meaningful consequences on the degree to which pseudo-reformers' electoral fraud is caught and whether they are subsequently punished.

Our analysis is necessarily limited in that we focus on proportionality reforms in post-Communist countries as a case where democracy promoters encounter unintended consequences. Studying post-Communist contexts allows us to focus on a particularly salient set of cases with strong international democracy promoters, though it is impossible to fully isolate electoral proportionality reform as the one and only driver of international community praise. Yet, because electoral proportionality reforms are common in developing democracies across the world, we expect that the bottom-line result that the international community rewards country leaders who alter electoral proportionality, but make little democratic progress generalizes to other contexts. Future research may apply our theory to different regions to evaluate whether the degree of the proportionality of the reform affects how the IC assesses electoral integrity.

The broader implication of our analysis is that pseudo-democrats will exploit opportunities to gain international community benefits without making substantial democratic reforms. This finding is important because it suggests that the international community places too much emphasis on rewarding any form of perceived democratic progress without fully investigating to determine whether such efforts are sincere. On the other hand, the fact that democracy promotion has unintended consequences that we are able to explain here is not necessarily normatively bad. It may be worth it to the international community to push for and reward surface-level democracy reforms if they believe that said reforms will eventually aid democratic progress. Our study is not the first to identify the unexpected consequences of democracy promotion, but we model this process for the first time and show its existence in electoral system reform, one of the most consequential ways to further democratic development.

References

Asunka, Joseph, Sarah Brierley, Miriam Golden, Eric Kramon, and George Ofosu. 2019. "Electoral Fraud or Violence: The Effect of Observers on Party Manipulation Strategies." *British Journal of Political Science* 49(1): 129–151.

BBC. 2012. "Ukraine Election 'abuse' Deplored." http://www.bbc.com/news/world-europe-20120888.

Beber, Bernd, and Alexandra Scacco. 2012. "What the Numbers Say: A Digit-Based Test for Election Fraud." *Political Analysis* 20(2): 211–234.

Benford, Frank. 1938. "The Law of Anomalous Numbers." *Proceedings of the American Philosophical Society* 78(4): 551–572.

Benoit, Kenneth. 2000. "Which Electoral Formula Is the Most Proportional? A New Look with New Evidence." *Political Analysis* 8(4): 381–388.

Bielasiak, Jack, and John W. Hulsey. 2013. "Party System Determinants of Electoral Reform in Post-Communist States." *Communist and Post-Communist Studies* 46(March): 1–12.

Birch, Sarah. 1998. "Electoral Systems, Campaign Strategies, and Vote Choice in the Ukrainian Parliamentary and Presidential Elections of 1994." *Political Studies* 46(1): 96–114.

Birch, Sarah. 2005. "Single-Member District Electoral Systems and Democratic Transition." *Electoral Studies* 24(June): 281–301.

Birch, Sarah. 2007. "Electoral Systems and Electoral Misconduct." *Comparative Political Studies* 40(December): 1533–1556.

Blais, Andre, Agnieszka Dobrzynska, and Indridi H. Indridason. 2005. "To adopt or not to adopt proportional representation: The politics of institutional choice*." British Journal of Political Science* 35(1): 182—190.

Bol, Damien, Jean-Benoit Pilet, and Pedro Riera. 2015. "The International Diffusion of Electoral Systems: The Spread of Mechanisms Tempering Proportional Representation across Europe: The International Diffusion of Electoral Systems." *European Journal of Political Research* 54(May): 384–410.

Bolt, Jutta, Robert Inklaar, Herman de Jong, and Jan Luite van Zanden. 2018. Rebasing 'Maddison': New Income Comparisons and the Shape of Long-Run Economic Development. Technical Report 10.

Bonferroni, Carlo E. 1936. *Teoria statistica delle classi e calcolo delle probabilità.* R Istituto Superiore di Scienze Economiche e Commerciali di Firenze

Burnell, Peter. 2008. "International democracy promotion: a role for public goods theory?" *Contemporary Politics* 14(1): 37–52.

Carothers, Thomas. 1997. "The Rise of Election Monitoring: The Observers Observed." *Journal of Democracy* 8(3): 17—31.

Carothers, Thomas. 2009. "Democracy Assistance: Political Vs. Developmental?" *Journal of Democracy* 20(1): 5-19.

Casier, Tom. 2011. "The EU's Two-Track Approach to Democracy Promotion: The Case of Ukraine." *Democratization* 18(4): 956-977.

Chaisty, Paul and Svitlana Chernykh. 2017. "How do Minority Presidents Manage Multiparty Coalitions? Identifying and Analyzing the Payoffs to Coalition Parties in Presidential Systems." *Political Research Quarterly* 70(4):762-777.

Collins, Kathleen. 2006. *Clan Politics and Regime Transition in Central Asia*. New York: Cambridge University Press.

Coppedge, Michael, John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Svend-Erik Skaaning, Jan Teorell, David Altman, Michael Bernhard, M. Steven Fish, Agnes Cornell, Sirianne Dahlum, Haakon Gjerløw, Adam Glynn, Allen Hicken, Joshua Krusell, Anna Lührmann, Kyle L. Marquardt, Kelly McMann, Valeriya Mechkova, Juraj Medzihorsky, Moa Olin, Pamela Paxton, Daniel Pemstein, Josefine Pernes, Johannes Von Römer, Brigitte Seim, Rachel Sigman, Jeffrey Staton, Natalia Stepanova, Aksel Sundström, Eitan Tzelgov, Yi-Ting Wang, Tore Wig, Steven Wilson, and Daniel Ziblatt. 2020. "V-Dem Country-Year Dataset 2020."

Crisp, Brian F., Patrick Cunha Silva. 2020. "Electoral Systems and System Reforms in Latin America." *Oxford Research Encyclopedia of Politics.*

Deckert, Joseph, Mikhail Myagkov, and Peter C. Ordeshook. 2011. "Benford's Law and the Detection of Election Fraud." *Political Analysis* 19(3): 245–268.

Dimitrova, Antoaneta, and Geoffrey Pridham. 2004. "International Actors and Democracy Promotion in Central and Eastern Europe: The Integration Model and Its Limits." *Democratization* 11(December): 91–112.

Doherty, David, Amanda Clare Bryan, Dina Hanania, and Matthew Pajor. 2020. "The Public's Foreign Aid Priorities: Evidence from a Conjoint Experiment." *American Politics Research* 48(September): 635–648.

Drazanova, Lenka. 2019. "Historical Index of Ethnic Fractionalization Dataset (HIEF)."

EAEO. 2012. "Ukraine's Parliamentary Elections Broadly in Line with Democratic Standards, According to International Observers." http://www.prnewswire.co.uk/news-releases/ukrainesparliamentary-elections-broadly-in-line-with-democratic-standards-according-to-internationalobservers-176235571.html.

Gallagher, Michael. 1991. "Proportionality, Disproportionality and Electoral Systems." *Electoral Studies* 10(March): 33–51.

Gallagher, Michael, ed. 2008. *The Politics of Electoral Systems*. 1st ed. New York: Oxford University Press.

Goldsmith, Arthur A. 2008. "Making the world safe for partial democracy? Questioning the premises of democracy promotion." *International Security* 33(2): 120–147.

Grimm, Sonja. 2019. "Democracy Promotion in EU Enlargement Negotiations: More Interaction, Less Hierarchy." *Democratization* 26(5): 851-868.

Gromping, Max. 2020. "Agents of Resistance and Revival? Local Election Monitors and Democratic Fortunes in Asia." *Democratization* Online First.

Hartigan, J. A., and P. M. Hartigan. 1985. "The Dip Test of Unimodality." *The Annals of Statistics* 13(March): 70–84.

Heinrich, Tobias, and Yoshiharu Kobayashi. 2020. "How Do People Evaluate Foreign Aid To 'Nasty' Regimes?" *British Journal of Political Science* 50(January): 103–127.

Herron, Erik S. 2015. "Election Integrity in Ukraine: A Comparative Perspective." *Comparative Politics Newsletter* 25(2): 29-32.

Hicken, Allen, and Walter R. Mebane Jr. 2017. A Guide to Election Forensics. USAID.

Hyde, Susan D. 2011. *The Pseudo-Democrat's Dilemma: Why Election Observation Became an International Norm*. Ithaca, New York: Cornell University Press.

Hyde, Susan D., and Nikolay Marinov. 2012. "Which Elections Can Be Lost?" *Political Analysis* 20(2): 191–210.

Interfax-Ukraine. 2014. "International Republican Institute Congratulates Ukraine on Elections That Meet International Standards." *Interfax-Ukraine*.

IRI. 1994. Ukraine Election Observation Report.

IRI. 2006. Ukraine Parliamentary and Local Elections: Election Observation Mission Final Report.

Jacobs, Kristof, and Monique Leyenaar. 2011. "A Conceptual Framework for Major, Minor, and Technical Electoral Reform." *West European Politics* 34(May): 495–513.

Kaminski, Marek M. 2002. "Do Parties Benefit from Electoral Manipulation? Electoral Laws and Heresthetics in Poland, 1989-93." *Journal of Theoretical Politics* 14(3): 325–358.

Klein, Aidan, and Bryon Moraski. 2019. "Incentive to Deliver: Authoritarian Rule, Proportional Representation, and Support for Russia's Ruling Party." *Journal of Elections, Public Opinion and Parties* Online First.

Klimek, Peter, Yuri Yegorov, Rudolf Hanel, and Stefan Thurner. 2012. "Statistical Detection of Systematic Election Irregularities." *PNAS* 109(October): 16469–16473.

Kovalov, Maksym. 2014. "Electoral Manipulations and Fraud in Parliamentary Elections: The Case of Ukraine." *East European Politics and Societies* 28(4):781-807.

Lehoucq, Fabrice. 2003. "Electoral Fraud: Causes, Types, and Consequences." *Annual Review of Political Science* 6(1): 233–256.

Lehoucq, Fabrice, and Kiril Kolev. 2015. "Varying the Un-Variable: Social Structure, Electoral Formulae, and Election Quality." *Political Research Quarterly* 68(June): 240–252.

Marshall, Monty G., and Ted G. Gurr. 2020. Polity 5 - Political Regime Characteristics and Transitions, 1800-2018. Center for Systemic Peace.

McFaul, Michael. 2004. "Democracy promotion as a world value." *The Washington Quarterly* 28(1): 147–163.

Mebane Jr., Walter R. 2008. "Election Forensics: The Second-Digit Benford's Law Test and Recent American Presidential Elections." In *The Art and Science of Studying Election*

Fraud: Detection, Prevention, and Consequences, ed. R. Michael Alvarez, Thad E. Hall, and Susan D. Hyde. Brookings Institution pp. 162–181.

Medzihorsky, Juraj. 2015 "Election fraud: A latent class framework for digit-based tests." *Political Analysis.* Vol 23(4) 506-517.

Meyerrose, Anna. 2020. "The Unintended Consequences of Democracy Promotion: International Organizations and Democratic Backsliding." *Comparative Political Studies* 53(10-11): 1547-1581.

Myagkov, Mikhail, Peter C. Ordeshook, and Dimitri Shakin. 2009. *The Forensics of Election Fraud: Russia and Ukraine.* Cambridge: Cambridge University Press.

Myagkov, Mikhail, Peter C. Ordeshook, and Dimitri Shakin. 2007. "The Disappearance of Fraud: The Forensics of Ukraine's 2006 Parliamentary Elections." *Post-Soviet Affairs* 23(3):218-239.

Nikolenyi, Csaba. 2011. "When Electoral Reform Fails: The Stability of Proportional Representation in Post-Communist Democracies." *West European Politics* 34(May): 607–625.

Nohlen, Dieter and Philip Stöver. 2010. *Elections in Europe. A Data Handbook.* Nomos.

Norris, Pippa, Richard W. Frank, and Ferran Martinez i Coma. 2014. *The Year in Elections*, 2013. The Electoral Integrity Project.

OSCE. 1998. Republic of Ukraine: Parliamentary Elections 1998.

OSCE. 2002. Ukraine: Parliamentary Elections Final Report.

OSCE. 2006. Ukraine: Parliamentary Elections 2006.

OSCE. 2007. Ukraine: Parliamentary Elections 2007.

OSCE. 2012. Republic of Ukraine: Parliamentary Elections 2012.

OSCE. 2014. Ukraine: Early Parliamentary Elections Final Report.

OSCE. 2019. Ukraine: Parliamentary Elections 2019.

Pericchi, Luis, and David Torres. 2011. "Quick Anomaly Detection by the Newcomb–Benford Law, with Applications to Electoral Processes Data from the USA, Puerto Rico and Venezuela." *Statistical Science* 26(November): 502–516.

Rozenas, Arturas. 2017. "Detecting Election Fraud from Irregularities in Vote-Share Distributions." *Political Analysis* 25:41-56.

Roussias, Nasos, and Ruben Ruiz-Rufino. 2018. ""Tying incumbents' hands": The effects of election monitoring on election outcomes." *Electoral Studies* 54: 116–127.

Ruiz-Rufino, Rubén. 2018. "When Do Electoral Institutions Trigger Electoral Misconduct?" Democratization 25(February): 331–350.

Shapovalova, Natalia. 2010. Assessing Democracy Assistance: Ukraine.

Shugart, Matthew Soberg, and Professor Rein Taagepera. 1989. *Seats and Votes: The Effects and Determinants of Electoral Systems*. New Haven: Yale University Press.

Simpser, Alberto, and Daniela Donno. 2012. "Can international election monitoring harm governance?" *The Journal of Politics* 74(2): 501—513.

Solonenko, Iryna. 2009. "External Democracy Promotion in Ukraine: The Role of the European Union." *Democratization* 16(4): 709-731.

Swedlund, Haley J. 2017. "Can Foreign Aid Donors Credibly Threaten to Suspend Aid? Evidence from a Cross-National Survey of Donor Officials." *Review of International Political Economy* 24(May): 454–496.

Tomini, Luca. 2014. "Reassessing democratic consolidation in Central and Eastern Europe and the role of the EU." *Europe-Asia Studies* 66(6): 859–891.

UN. 2013. UN Support to Electoral System Design and Reform.

Venice Commission. 2018. *Identification of Electoral Irregularities by Statistical Methods*. Available at: https://www.venice.coe.int/webforms/documents/?pdf=CDL-AD(2018)009-e. Accessed on May, 12, 2021.

von Soest, Christian. 2015. "Democracy Prevention: The International Collaboration of Authoritarian Regimes." *European Journal of Political Research* 54(November): 623–638.

WDI. 2020. "World Development Indicators."

Wilson, Andrew, and Sarah Birch. 1999. "Voting Stability, Political Gridlock: Ukraine's 1998 Parliamentary Elections." *Europe-Asia Studies* 51 (6): 1039–68.

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Endnotes

[1] Replication data are available on SAGE Publication's servers and also at the authors' websites.

[2] See the Supplemental Information (SI) A for a discussion of this and other model assumptions.

[3] We discuss electoral fraud in general terms in the model. The empirical analysis tests the model's empirical implications on both a general measure of fraud and vote count fraud.

[4] See SI A for the mathematical proofs and additional model details.

[5] See SI D for sources.

[6] We consider four technical modifications (e.g., changes in the average district magnitude lower than 1%) as instances of no change (Jacobs and Leyenaar, 2011).

[7] We only include multi-party elections in our dataset. All first multi-party elections are coded as "no reform."

[8] Data are available at Gallagher's website: https://bit.ly/2HBbOZg. Accessed on 04/30/2020.

[9] See Table C.6 in SI C for Benoit's ranking of electoral formulas.

[10] We only detected one mixed-reform, Georgia 1995, in which M increased, seat allocation formula changed in the majoritarian tier from two-round absolute majority to qualified majority, and a threshold was created in the PR tier. Because two of these reforms (M and seat allocation formula) should increase proportionality, we code this reform as one that increased proportionality.

[11] We recognize that this is only a partial control for the geopolitical orientation of the incumbent government.

[12] Alternative specifications are in Table C.2 (fixed effects and lag dependent variable models). Our results are robust to including post-treatment controls for electoral violence, whether the incumbent lost the election, prevalence of government intimidation, voting irregularities, and

election fairness (Table C.3). Because some of our control variables might be considered endogenous, we present results for models without controls in Table C.4.

[13] Data for the FPTP tier in the 2002 election are not available. Both our hypotheses and our analysis examine the association between proportionality and fraud declarations, not causality.

[14] We exclude electoral returns that have fewer than 2 digits and precincts with fewer than 10 valid votes.

[15] We also ran the test proposed by Rozenas (2017) based on the occurrence of coarse vote shares. See Table C.5 (SI.C). The findings are consistent with the ones reported in the body of the paper. Specifically, we show that evidence of numerical fraud does not correlate well with IC's assessments of elections.

[16] The 2004 reform was approved during President Kuchma's second term. Because President Kuchma was an independent, for the 2006 election, we use the electoral return of the largest party in the Kuchma coalition (Chaisty and Chernyk, 2017).

[17] Not all tests may be equivalent, but there is no clear indication about which tests should be prioritized (Venice Commission, 2018).

[18] Myagkov, Ordeshook, and Shakin (2007) note an improvement compared to the 2004 presidential election when examining relationships between turnout, vote share, and the flow of votes at the county level. Our precinct-level data is more detailed.

[19] Though the OSCE acknowledged that the elections were successful — given that they were held under difficult circumstances — it noted that there were problems, including manipulation of the results (OSCE, 2014, 30).

[20] Since Medizhorsky's (2015) test was published recently, it is unlikely that political actors have simply learned how to fabricate numerical results.