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A systematic approach to study electoral fraud☆

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ABSTRACT

Integrity of elections relies on fair procedures at different stages of the election process, and fraud can occur in many instances and different forms. This paper provides a general approach for the detection of fraud. While most existing contributions focus on a single instance and form of fraud, we propose a more encompassing approach, testing for several empirical implications of different possible forms of fraud. To illustrate this approach we rely on a case of electoral irregularities in one of the oldest democracies: In a Swiss referendum in 2011, one in twelve municipalities irregularly destroyed the ballots, rendering a recount impossible. We do not know whether this happened due to sloppiness, or to cover possible fraudulent actions. However, one of our statistical tests leads to results, which point to irregularities in some of the municipalities, which lost their ballots: they reported significantly fewer empty ballots than the other municipalities. Relying on several tests leads to the well known multiple comparisons problem. We show two strategies and illustrate strengths and weaknesses of each potential way to deal with multiple tests.

1. Introduction

Election fraud is not necessarily confined to young and fragile democratic states. While a large part of the election fraud literature has looked at democratizing or non-democratic countries, this article investigates fraud that might have occurred recently in one of the oldest democracies,[2] and aims at presenting a forensic toolbox for detection of manipulations of ballots and the vote count. This is done based on a new, systematic empirical approach. It is built on two theoretical insights on election or referendum fraud: first, election fraud or misconduct can occur in many different instances of the election process, and in many different ways. Therefore, electoral forensics are strongest when a number of different tests are conducted. Second, each type of fraud is rooted in a specific micro-foundation, which should inform the empirical tests. This has important implications for the analysis of the integrity of elections or referendums. This approach is applied to a specific example: on February 13th 2011 the people in the Swiss canton of Berne voted on a motor tax (*Motorfahrzeugsteuer*). The very close outcome sparked hope that a recount might change the final outcome, which was granted after a legal battle. This is when the public

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[2] See also Cox and Kousser (1981) and Alvarez and Boehmke (2008).

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learned that almost one in twelve municipalities had violated the electoral law and destroyed the ballots instead of retaining them for one year (Nuspliger 2011). We ask whether this was pure carelessness, or possibly the attempt to hide electoral misconduct. Our forensic tests show that those municipalities that have destroyed the ballots have reported surprisingly few empty ballots in the electoral results. This paper applies several election forensic approaches to investigate the suspicion that results in the Bernese municipalities that have lost their ballots might have been manipulated. To do so, it makes several suggestions how the electoral forensic methods might be applied in a theory-driven way.

A quickly growing literature has developed two types of tools of vote forensics (e.g., Filippov and Ordeshook, 1996; Breunig and Goerres, 2011). One part of the literature discusses whether the analysis of single digits of the reported electoral results at the ward level can reveal that these numbers are based on the actual count of the votes, or whether they have been altered, relying on Benford's law on the frequency distribution of digits in numbers. A second literature investigates the plausibility of electoral results from wards, and is based on circumstantial information. This paper, first, provides a clear framework in which electoral forensics are carried out and to move away from ad-hoc hypotheses testing towards a more firmly rooted set of micro-foundations. This can help to derive much more precise empirical implications of fraud. Second, it considers that usually election fraud does not occur in a whole country, but is more likely in particular electoral wards (Alvarez and Boehmke, 2008).[3] We rely on models that suggest how election outcomes look in a fair election. These models can be tested on those municipalities where we do not expect fraud to have happened, and we can compare the results to municipalities with possible manipulations. Furthermore, we argue that different forms of manipulation vary in their likelihood, and tests of fraud should start with the formulation of a micro-logic of fraud (see also Beber and Scacco (2012)).

First, we lay out the different potential ways how fraud could occur in these votes. After deriving a micro-logic we connect each of the potential fraudulent acts with a specific tailored test statistic. Finally, we carry out all four derived tests and show how one can combine the different tests into an overall assessment. Substantively, we first investigate the plausibility of the electoral result and the number of invalid and empty ballots, relying also on historical vote data. Second, we rely on Benford's law, focusing on the last digit of the vote figures. We test whether voting results from those thirty municipalities which are unable to produce the ballots show implausible distributions of the last digit.

The next section discuss the literature on electoral fraud, and introduces the referendum of February 13th 2011. Section 3 proceeds with a discussion of statistical methods to detect electoral fraud. We lay out a number of plausible ways in which manipulation could have occurred which leads to the formulation of four distinct hypotheses. The results of these tests are presented and discussed in section 4. Finally, the concluding remarks are in section 5.

2. A Systematic approach for electoral forensics

Electoral fraud occurs in many different ways. The variety of forms of fraud reflects the long list of criteria that need to be established, so that elections can be considered free and fair. Some forms of misconduct occur before or during the election campaign, others on election day or during the vote count; some in the central election administrations, others decentralized (Schedler, 2002). This should be reflected in the approaches to prevent and detect fraud. On election day, the local electoral commissions might invalidate or remove ballots, stuff the ballot box with irregular ballots, change the content of the ballots, miscount the expressed votes, or alter the figures ex-post.

This variety of misconduct is reflected in a variety of actors and forms of behavior related to it, and most of all to very diverse approaches how fraud might be prevented or detected. While the prevention of fraud relies on instruments such as multi-partisan compositions of election commissions, transparency of the election process, exit polls, or election observers,[4] the post-hoc detection of possible fraud (election forensics) is less developed. One method, which has gained increasing attention in the literature, relies on the statistical properties of the distribution of digits in aggregated election results, based on Benford's law (e.g., Mebane, 2008, 2010b, 2011; Deckert et al., 2011; Beber and Scacco, 2012). Benford's law is suited, however, only to detect one very particular, and not always very likely form of fraud.

Systematic forensic approaches should be interested in a variety of traces, which result from the specific forms of electoral misconduct one wishes to detect. This has several implications. First, forensic methods should be based on micro-logics of fraud, which are plausible in the specific setting where the election takes place. Therefore, we first need to gain knowledge of the electoral process, as only this allows us to identify the leeway that involved actors have to commit fraud, and possible logics of fraud.[5] Second, we can only rule out fraud, once we investigated all possible instances and forms of it. This cannot be fully implemented in practice, as some forms of fraud might not be detectable.[6] Still, it is worth to consider the most important instances where fraud might have occurred. Third, the analysis of the context of the election should also discuss the difficulty and effectiveness of different forms of fraud, in order to identify those most likely to occur. A set of hypotheses, addressing the traces of fraud, should therefore be derived from this discussion of micro-logics of fraud, and from the discussion of their relative likelihood. Following these suggestions, we

[3] See also Myagkov et al. (2008: 195). In contrast, in our model, the 'fraud suspicion' variable is exogenous to the model.

[4] See, among others, Hyde and Marinov (2008) and Mozaffar and Schedler (2002).

[5] For a nice exception in the literature see the paper by Myagkov et al. (2005) where they employ different tests and approaches.

[6] And with too many parallel tests, we would most likely find some positive results, even at the absence of fraud.