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Abstract

Social media provides political actors, opinion makers, and the electorate with the opportunity to bypass traditional media and engage in direct exchange of political information. This article explores how political candidates in the 2014 legislative election in Indonesia used social media during their political campaign. Exploiting a unique hand-collected data set, the study sheds light on personal characteristics that have explanatory power for political candidates' choice to engage over social media. It also provides insight into the content of politicians' messages and drivers for different types of content. The findings suggest that social media is used by a relatively large percentage of politicians in Indonesia and that they use social media platforms such as Twitter to engage with their electorate on several topics related to their campaign during election periods.

JEL Classifications: D72; L82
Keywords: Indonesia; Social media; Elections; Politics; Democratic process; Political process; Media industry

1 Introduction

Who is using social media for political campaigning? What are the drivers behind political candidates' use of social media during election periods? What type of content do political candidates focus on while engaging with their electorate over social media? As the use and influence of social media is on the rise, these questions are becoming increasingly important. A burgeoning literature on social media and politics has primarily focused on developed countries. This is to be expected, as social media spread the fastest in the U.S. and Europe. For example, approximately 65 percent of all adults in the U.S. were active on at least one social media platform in 2015. At that time around an astonishing 90 percent of all young adults between 18 and 29 were using social media platforms. The reach and potential influence of social media on the political process in the West is evident, as has been shown by several studies, including Lassen et al. (2011), Gainous and Wagner (2014), and Kreiss (2016) on the U.S. case, Larsson and Moe (2011) on the case of Sweden, Raufleisch and Metag (2015) on the case of Switzerland, and Graham et al. (2014) on the case of the U.K. and the Netherlands.

In this article, we try to answer these questions in the context of a democratic developing country. We do this by using the 2014 legislative elections in Indonesia as the setting for a comprehensive empirical analysis on elected political candidates' use of Twitter. While internet penetration and the use of social media are still not up to par with those of most Western countries, the Indonesian people has embraced social media as a way to communicate and obtain information. We Are Social (2016) reports that over 88 million Indonesians had access to internet in the beginning of 2016. Out of these, 79 million, or approximately 90 percent, were active on at least one social media platform. It has repeatedly been reported that Jakarta is the Twitter capital of the world

(e.g., Lipman, 2012), resulting in Twitter setting up a physical presence in the city in 2015 (Schonhardt, 2015). Johansson (2016) hypothesizes that one reason for why social media is quickly becoming so popular in countries such as Indonesia is that it effectively circumvents the limitations of traditional media, which can be particularly severe in countries characterized by weaker institutions and a captured media industry. This argument is also supported by a rich literature on media capture.

The empirical analysis in this study is based on a unique and manually collected data set on political candidates and their use of Twitter. Four main empirical findings are worth noting. First, the data show that a relatively large share of the elected candidates in the 2014 legislative election were active on Twitter and that candidates across gender, age, marital status and other personal characteristics were communicating with their electorate over social media during the campaign period. Second, the results suggest that Twitter activity varied across the sample based on individual characteristics such as age, education, incumbency status, and party affiliation. Third, the analysis on the content that the candidates sent out during the campaign period provides evidence suggesting that candidates communicate with their electorate on a wide range of issues related to their work as politicians. Fourth, personal characteristics and party affiliations also have explanatory power for the topics candidates tweet about.

These findings demonstrate how political actors use social media to engage with their constituencies during election periods. As such, they have important implications for our understanding of the functioning of the democratic process in developing countries such as Indonesia. The emergence of social media can enable political actors to free themselves from the limitations of traditional media which can often provide a one-sided information flow, resulting in limited capacity for critical

resistance (Zaller, 1992, p. 253). Research has shown that the emergence of two-sided communication can rapidly break popular support built up through one-sided communication (Zaller, 1992, p. 307). In this context, social media provides an avenue for both two-sided communication and two-way dialogue between political candidates and the electorate. If used efficiently, social media platforms thus bring with them opportunities to level a playfield that in many countries traditionally has been controlled by the elite. While the potential impact of social media on politics is significant, it should be noted that the findings in this study primarily highlight the use rather than the influence of social media in the political process. More research is needed to gauge the actual impact social media has on the political process in developing democratic countries.

There are a few related studies on the relationship between social media and politics in Indonesia. Lim (2013) looks at social media activism. Using case studies, she argues that for social media activism to translate into political activism, the message must be packaged the right way. Nugroho et al. (2012) and Nugroho and Syarief (2012) provide interesting discussions on social media and politics in Indonesia with a particular focus on citizens' rights and civil society. Ahmad and Popa (2014) use the 2012 gubernatorial election in Jakarta as a case study in their discussion on social media and political marketing. In a paper that relates to this study, Chen and Priamarizki (2014) discusses the role of new media in the political process running up to the 2014 elections. They argue that a participatory climate that emerged after *Reformasi* in the end of the 1990s combined with new media allowed for the electorate to have more leverage over the choice of political candidates. Finally, Johansson (2016) presents a detailed discussion on the general relationship between social media and politics and then apply that framework to the case of Indonesia. This article

complements these previous studies as it is, to the best of our knowledge, the first study that provides a comprehensive empirical analysis of politicians' social media use and drivers behind that use in Indonesia.

The rest of this study is organized as follows. To put the empirical analysis in context, Section 2 describes the 2014 legislative elections in Indonesia. Section 3 provides a brief framework for the role that traditional and social media play in politics based on recent research. Section 4 then describes the data and methodology used in the empirical analysis. Section 5 presents and discusses the results of the empirical analysis in three steps: data overview, drivers of politicians' use of Twitter, and content and drivers of content in politicians' tweets. Finally, Section 6 concludes the paper with a discussion on the findings and thoughts on future research.

2 Indonesia's 2014 Legislative Elections

National legislative elections in Indonesia are no small affairs. Indonesia is the world's largest archipelagic state with over 17,500 islands and approximately 250 million people, some living in densely populated areas and others on remote and sparsely populated islands. In 2014, there were about 4 million election officials involved in the elections that took place in over 545,000 polling stations across the country. There are two national legislative assemblies with elected members: *Dewan Perwakilan Rakyat* (DPR, or the People's Representative Council) and *Dewan Perwakilan Daerah* (DPD, or the Regional Representative Council). Members of the legislative bodies as well as the President and Vice President are elected by the people for five years at a time. At the national level, the DPR has 560 seats while the DPD has 136. The DPR has three primary functions: legislative, budgeting and oversight. The DPD functions differently. Its members do not belong to a specific political party and the

assembly has very little influence on national politics as it is limited to areas related to the regional governments around the country and to give advice to the DPR.[2] Because of this, the focus of this study is solely on the DPR election.

The 560 representatives in the DPR were elected in 77 multi-member electoral districts in the 2014 election. Party lists were provided to voters through a so-called open-list proportional representation system. In addition to the seats at the national level, elections were held for seats in the 33 province-level *Dewan Perwakilan Rakyat Daerah* (DPRD) and in the 497 district-level DRPRDs, where each district is called a *kabupaten* (regency) or *kota* (city or municipality). In total, voters thus received four different ballots during the legislative elections in 2014: the DPR, the DPD, and the DPRD at the provincial and *kabupaten*/*kota* level, respectively.[3] On the DPR ballot, all parties and candidates that are running in an electoral district are listed. The voter can then punch for one candidate, one political party, or both. In case the voter punches both, the party must be the same as the candidate's party for the vote to be valid. The requirements for eligibility to register and take part in the election are strict. First and foremost, non-party candidates are not allowed to take part in Indonesia's legislative elections. All candidates need to be formally nominated by a national party (except in Aceh, where candidates can be nominated by a local party). A political party needs to have a branch and a branch office in every province, a branch and a branch office in at least 75 percent of *kabupaten* or *kota* in every province, and a branch in at least 50 percent of the districts in every *kabupaten* or *kota*. In addition, the party needs at least 1,000 registered members and one third of the party's candidates are required to be

[2] DPD primarily provides input and recommendations on issues that relate to regional autonomy, the potential establishment of new regions, management of natural resources across the archipelago, and monetary policy at both the central and regional level.

[3] The only exception to this is voters in *Daerah Khusus Ibu Kota Jakarta* (the Jakarta Special Capital Region), whom only received three ballots. This is because there is no DPRD *kabupaten*/*kota* election in Jakarta.

female. Finally, there is a legislative threshold of 3.5 percent of the vote that is needed to enter the house for the DPR at the national level (this threshold does not apply to the subnational levels).

In the 2014 DPR legislative election, there was a total of approximately 186 million registered voters. Out of these, about 125 million people cast a valid vote. In total, 46 different parties tried to register for the DPR election. In the end, only 12 parties met the official requirements and were allowed to participate in the national DPR election. When the votes were counted, two parties failed to reach the 3.5 percent threshold, leaving a total of ten parties represented in the DPR for the following five-year period.[4] In the election, each province was divided into a specific number of electoral districts depending on the size of the population. Each of these electoral districts then elected between three and ten members by proportional representation. Table 1 shows the allocation of seats in the DPR across provinces.

[Table 1 here]

Besides the importance of obtaining seats in the DPR itself, the legislative elections are crucial for the subsequent presidential election. A political party, or a coalition of parties, that wins 25 percent of the votes or at least 20 percent of the seats in the DPR in the legislative elections are eligible to nominate candidates for President and Vice President. The presidential election is typically held shortly after the legislative elections have established which parties or coalitions are eligible to nominate their

[4] All ten parties that are represented in the DPR after the 2014 election are listed later in this paper. The two parties that failed to obtain seats in the DPR were *Partai Bulan Bintang* (PBB, or the Crescent Star Party) and *Partai Keadilan dan Persatuan Indonesia* (PKPI, or the Justice and Unity Party).

candidates. For the 2014 elections, the KPU set July 9 as the date for the presidential election.

3 Social Media's Role in Politics[5]

Social media platforms such as Facebook, Twitter, Instagram, YouTube, Google+, Line, Snapchat, WhatsApp, WeChat have become standard apps on most mobile phones across the world. The functions of social media stand in stark contrast to those of traditional media. Different forms of traditional media such as newspapers, televisions, and radio broadcasting rely on monologic transmissions, where a single or a few single sources distribute information to a large number of recipients (Johansson, 2016). Johansson (2016) points to two important features of the social media landscape. First, a participatory culture has evolved over the different platforms. Consumers can participate directly in the creation and spread of information instead of being passive receivers. Individuals are also interacting directly which each other, thereby creating new streams of information. As noted by Jenkins et al. (2009), participatory cultures such as the ones found on social media are more about membership, collaboration and sharing than ownership. Moreover, internet and social media not only provide two-way communication. Instead, it offers almost infinite ways of communication. As a result, a strong form of polarizing effects can develop, with different groups of people who share similar interests and opinions building up networks in which certain types of information flow. As pointed out by Gainous and Wagner (2014, pp. 10-15), an effect of this is that online networks tend to become increasingly ideological and polarized.

Traditional media has often been accused of being biased. Examples of studies that highlight bias and capture in media include Qian and Yanagizawa (2009), Petrova

[5] Part of the paragraphs in this section are modified from Johansson (2016).

(2014) and Adena et al. (2014). As the media industry in many countries has undergone consolidation, the risk of media capture also increases (e.g., Besley and Prat, 2006; Gentzkow and Shapiro, 2008). Finally, so-called gatekeepers (editors, journalists, etc.) typically control content, thereby limiting the ability of politicians and others to make their voice heard in a way they want to. In the absence of strong gatekeepers typically found in traditional media, political actors and different types of interest groups can come to dominate the flow of information in these networks (Gainous and Wagner, 2014, p. 14). Social media platforms thus constitute new channels that politicians can use to reach out to their constituencies. Moreover, the fact that information can flow in both directions enables a direct dialogue between politicians and their key audiences, something that traditional media cannot provide.

Studies on Western countries have shown that social media represents an important channel for politicians to inform and engage with their target audience. For example, Gainous and Wagner (2014) explore a variety of questions related to how candidates in the 2010 election to the U.S. Congress use Twitter to communicate their messages to their constituencies. In a related study, Lassen and Brown (2011) analyze personal characteristics that drive the use of Twitter among members of Congress in the U.S. Rauchfleisch and Metag (2015) analyze how individual characteristics among politicians affect the use of Twitter in the Swiss Parliament. Graham et al. (2016) compare Twitter use among British and Dutch parliamentary candidates during the 2010 elections in the two countries, finding that Dutch politicians used Twitter significantly more than their British counterparts. They also highlight that the public responded to this by engaging in dialogue.

To sum up, social media brings with it new opportunities for political actors to engage with their key audiences. Contrary to traditional media, social media allows for

direct communication and have very low barriers to entry for those who wish to make their voice heard. Previous studies have primarily analyzed how political actors in developed countries use social media to reach out to their constituencies. This study thus complements the existing burgeoning literature on social media and politics by focusing on the use of social media by political candidates during elections in Indonesia, a large democratic developing country where social media use is widespread.

4 Data and Methodology

4.1 Data

The empirical analysis in this study uses two data sets, both of which are hand collected. The first data set contains all winning political candidates in the 2014 DPR election. In addition to the identity of each candidate, a number of personal and political characteristics have been collected, including gender, age, birth province, marital status, number of children, educational attainment, incumbency and political party affiliation. Most of the data on the winning political candidates was collected from the website *Daftar Calon: Anggota DPR, DPD, dan DPRD Pemilhan Umum 2014* provided by *Komisi Pemilihan Umum* (the General Elections Commission). A small number of missing values for some of the variables necessitated additional data collection using other online resources, including news outlets and official government websites. In the end, complete data for all 560 winning candidates were obtained.

The second data set is comprised of Twitter data for all 560 winning candidates in the 2014 DPR election. First, we ascertained whether each candidate had a Twitter account. We then analyzed the content of each account to shed light on the level of activity. As a third step, we collected all tweets from each winning candidate for the

period January 1, 2014 to the day of the elections (April 9, 2014). For additional analysis, we also collected tweets from before the campaign period as well as for a period after the election. Finally, we analyzed the content in each tweet and divided the Twitter data sample into seven content categories: election, personal, religion, campaign, opponent, policy, and political party. For example, if a tweet mentioned the election, it was categorized as an election tweet, and if a candidate mentioned his or her opponent(s), the tweet was categorized as an opponent tweet. Each tweet can thus belong to one or several of the seven categories, even though most tweets in our sample belongs to one category.

4.2 Research Methodology

The main objectives with the empirical analysis in this paper are to obtain a better understanding of personal characteristics of politicians and how they relate to the use of Twitter, to identify drivers behind the use of Twitter, and to identify factors that help explain social media content among politicians in Indonesia. To do this, we rely on three empirical approaches. First, we provide a detailed overview of the data with a focus on the relationship between the use of Twitter and personal characteristics. Second, the drivers behind the use of Twitter are analyzed using the following logistic regression model:

$$\ln\left(\frac{p(Twitter_i)}{1-p(Twitter_i)}\right) = \alpha + \beta_1 gender + \beta_2 age + \beta_3 birth\_prov + \beta_4 married + \quad (1)$$

$$\beta_5 children + \beta_6 education + \beta_7 incumbency + \beta_8 religion + \delta pol\_party_i + \varepsilon_i.$$

Here, the left-hand side is the logit of political candidate *i* being active on Twitter. The independent variables are: *gender*, a variable that equals one if the political candidate is

male and zero otherwise; *age*, a variable that equals one if the political candidate is above the median age of the sample and zero otherwise; *birth_prov*, which equals one if the political candidate is running for office in his or her birth province and zero otherwise; *married*, which equals one if the political candidate is married and zero otherwise; *children*, equal to one if the political candidate has at least one child and zero otherwise; *education*, which equals one if the political candidate has an education that is above the median of educational attainment in the sample and zero otherwise; *incumbency*, which equals one if the political candidate is the incumbent and zero otherwise; *religion*, a dummy variable that equals one if the political candidates religion is Islam and zero otherwise; *pol_party*, a categorical value for the political candidate's party affiliation that is transformed into dummy variables for each party except one that is omitted in order to avoid multicollinearity issues. The logit model is estimated using robust standard errors.

Third, the use of different types of content in Twitter messages from political candidates is examined with models suitable for the analysis of count data. Standard linear regression models are not suitable for this type of data as they fail to take the limited number of possible values of the dependent variable into account. A count data regression model using the data set in this study can be written as:

$$y_i = \alpha + \beta_1 gender + \beta_2 age + \beta_3 birth_{prov} + \beta_4 married + \beta_5 children + \beta_6 education + \beta_7 incumbency + \beta_8 religion + \delta pol\_party_i + \varepsilon_i. \quad (2)$$

Here, y_i is the number of tweets with a specific type of content posted by political candidate *i*. The independent variables on the right-hand side of the model are the same as those found in Model (1) which are explained above.

The most basic count technique employed to model count data is the Poisson regression model, so this is where we begin our analysis. However, an important limitation of the Poisson model is the assumption of equality of its mean and variance. It turns out that this assumption is often violated in a variety of data types. If the conditional variance is larger than the conditional mean, a phenomenon called overdispersion, a different model specification should be used. A suitable alternative is the negative binomial regression model, which allows the variance to differ from the mean. Finally, many data sets in social science include a large number of zero values. To take this feature into account, it is possible to employ a zero-inflated version of the Poisson or the negative binomial regression model. Fortunately, the suitability of each of these models can be tested. The dispersion parameter in the binomial regression model can be analyzed and compared against the standard Poisson model. Similarly, it is possible to compare the suitability of the standard versus the zero-inflated version of a regression model using the so-called Vuong test. This study takes all these potential issues into account and presents the preferred models as well as the test statistics for them. As with the analysis on drivers behind the use of Twitter discussed above, to strengthen the results, robust standard errors are used for all model specifications employed during the analysis of the content in political candidate's tweets.

5 Empirical Analysis of Political Candidates' Twitter Use

This section first gives a detailed presentation of the data, combining the data set on political candidates with the Twitter data set. After that, an empirical analysis of drivers behind politicians' use of Twitter is presented and discussed. Finally, estimations on the different content categories for politician's tweets are presented and analyzed.

5.1 Data Sample

5.1.1 Winning Political Candidates

We first take a closer look at the winning political candidates in the 2014 DPR election. Table 2 displays summary statistics for personal characteristics as well as religion and party affiliation for the 560 winning candidates. The average age of winning candidates is just above 48 years, with the oldest winning candidate being 75 years and the youngest 25 years old. The average number of children among the candidates is close to 3, with a range from zero to eleven. The average level of education is almost right in between having an undergraduate and a graduate degree. An overwhelming share of the winning candidates are married. Approximately 35 percent of the winning candidates are incumbents, and 65 percent of them run for a DPR seat in the province in which they were born.

As can be expected, a majority (472 or 84.24 percent) of the winning candidates are Muslims. A total of 75 candidates are Christian (Protestant or Catholic), with the remaining candidates being Buddhists (3 candidates) or Hindu (10 candidates). 109 (19.46 percent) of the winning candidates are affiliated with PDI-P. The second largest party Golkar is represented by 91 candidates (16.25 percent). Gerindra and PD each have 73 and 61 candidates respectively, leaving the remaining six parties with less than 50 representatives each.

[Table 2 here]

5.1.2 Twitter Use

To get a comprehensive picture of how political candidates use Twitter, we collected all Twitter during what we call the election or campaign period, i.e. from

January 1, 2014 to the day of the election (April 9, 2014). In order to avoid inflated numbers resulting from candidates having passive accounts that are not open to the public, we only focus on accounts that are open to the public. Thus, to get an overall understanding of the candidates' use of Twitter, we first divided the sample into people with a public Twitter account and candidates who were active during the election period with active being defined as having tweeted at least once during the election period. Doing this, we found that no less than 355 or more than 63 percent out of the 560 winning candidates had a public Twitter account. As many as 172 or about 61 percent out of the total number of winning candidates were active on Twitter during the election period. These initial findings suggest that social media is being used by politicians in Indonesia as a means to reach out to their electorate during election periods.

Figure 1 shows the distribution of number of tweets among the winning candidates who were active on Twitter during the election period. 24 candidates tweeted between 1 and 200 times, 19 candidates tweeted 201-300 times, and 11 candidates tweeted 301-400 times. The rest of the candidates who were active on Twitter tweeted between 501 and 1000 times. The exception is a single candidate, who managed to tweet no less than 1,324 times between January 1 and April 9, 2014.

[Figure 1 here]

What about candidates depending on location? Is it the case that most winning candidates that are active on Twitter come from a limited number of provinces characterized by big cities and dense populations? To shed light on this, we display the use of Twitter across the archipelago in Figures 2 and 3. Figure 2 shows the percentage

of the winning candidates in each province who had a public account on Twitter during the election period. Perhaps somewhat unexpected, there is no clear pattern of the intensity of Twitter use across the country. Some of the provinces where the highest percentage of the candidates using Twitter are located far from Java, the most densely populate island in the country. For example, West Papua has the same percentage of winning candidates with a public Twitter account as Jakarta. In three provincial-level administrative regions, all winning candidates had a public account (Bengkulu on Sumatra, the special region of Yogyakarta, and Riau Islands).

[Figure 2 here]

Figure 3 instead displays the percentage of the winning candidates in each province who were active on Twitter during the election period. The overall picture is similar to the one found in Figure 2. The main difference is that more provincial-level administrative zones are characterized by no or relatively low Twitter activity among the winning candidates during the election period: ten regions have 0-19 percent of the total number of winning candidates being active on Twitter during the election period. There is no distinct pattern in the intensity of Twitter use across the country. Overall, the two figures suggest that the use of Twitter by politicians is spread out across the country.

[Figure 3 here]

Next, we take a closer look at Twitter use across political parties. Table 3 displays the ten parties that are represented by at least one politician. Column one again

shows the number of winning candidates for each party. Column two presents the number of winning candidates that were active on their Twitter accounts during the election period in each party. Finally, column three displays the share of candidates who were active on Twitter during the election period. The average percentage is approximately 33 percent. However, the ratio of candidates being active on Twitter to all candidates vary significantly across parties. The party with the most candidates on Twitter is PDI-P. However, looking at the ratios in column three, it is clear that PKS is the political party with the largest share of candidates who were active on Twitter during the election period. Out of a total of 40 elected candidates, as many as 26 or 65 percent were active on Twitter. The political party with the lowest share of elected candidates is Golkar. Out of a total of 91 winning candidates, only 16 or 17.58 percent were active on Twitter. This large variation in Twitter use suggests that party affiliation is likely to have explanatory power for the likelihood of Twitter use in our multivariate regression.

[Table 3 here]

5.2 Politician's Twitter Activity

5.2.1 A First Look at the Data

Before analyzing Twitter content sent out by the elected candidates, we begin with an empirical analysis of general Twitter activity. So far, we have only seen an overall picture of Twitter activity as well as general use of Twitter across political parties. Looking instead at the various personal characteristics, we are able to draw initial conclusions on factors that may have explanatory power for Twitter activity.

Figure 4 depicts the share of elected candidates who were active on Twitter during the election period relative to their peers. The first column diagram shows the percentage of male and female elected candidates. While a slightly higher ratio of males used Twitter during the election period, the difference among gender is almost negligible. The second diagram shows Twitter activity across three age cohorts. Here, the variation in Twitter activity is striking, with a much higher percentage of candidates being active on Twitter in the younger cohorts. In fact, less than 20 percent of the elected candidates who were 61 years or older at the time of the election were active on Twitter during the election period. On the other hand, for candidates between 21 and 40 years old, close to 35 percent tweeted at least once during the same period. This suggests that younger politicians are more likely to reach out to their constituents compared to their older counterparts. This preliminary finding is somewhat expected, as data on social media use indicate that young people are more likely to engage in communication over social media platforms.

The next diagram suggests that a somewhat higher percentage of elected candidates who were running in their birth province were active on Twitter. The different is small, however, which means that it is not a likely driver of general Twitter activity in the sample. For marital status, the picture is somewhat different. Married elected candidates are more active on Twitter compared to unmarried candidates (31.05 percent versus 25.71 percent in the two groups). Candidates with and without children exhibit a similar pattern, with candidates who have at least one child being more likely to be active on Twitter. One possible explanation for this is that children may introduce the use of social media at home, thereby making their parents more likely to become active on social media platforms as well. Looking instead at education attainment, the diagram clearly shows that level of education is positively associated

with Twitter activity. 33.46% of the elected candidates with a graduate degree were active on Twitter, while only 19.35 percent of the candidates were using Twitter during the election period. This finding is again expected, as studies on socio-economic characteristics and social media have shown that education levels and social media use is correlated. For example, in a comprehensive study on social media use in the U.S., Pew Research Center (2015) found that those with at least some college degree have been consistently more likely to use social media during the period 2005-2015.

Next, a higher percentage of the elected candidates who were incumbents were using Twitter during the election period compared to challengers. The difference is not large, 32.31 versus 29.86 percent. However, this finding differs significantly from those of Gainous and Wagner (2014, p. 82), who show that challengers tweeted much more frequently than incumbents during the 2010 election to the U.S. Congress. Finally, when comparing tweets based on religion, no significant difference is found in overall activity on Twitter.

[Figure 4 here]

5.2.2 Modeling Twitter Activity

The discussion on potential bivariate relationships between different socio-economic personal characteristics and Twitter activity in the previous section is interesting. However, while we found several seemingly important relationships between personal characteristics and Twitter activity, these relationships may well turn out to be spurious in nature. To determine if any of relationships discussed above are significant, we use multivariate models to estimate them. For completeness, we model

three dependent variables separately: public account, before pre-election (ending on December 31, 2013), and pre-election (the campaign period). Each of these variables are binomial, with 1 indicating that the elected candidate had a public account, was active before the campaign period, and was active during the campaign period, respectively. Since the dependent variables are categorical, we use the logistic regression model presented in Equation (1). We include all socio-economic characteristics, as well as party affiliation (affiliation to PDI-P is excluded to avoid multicollinearity issues).

The results of the logit regressions are presented in Table 4. Looking first at the estimation for public account in Column 1, the coefficient for age is negative and significant. This supports our initial findings in the previous section which suggested that Twitter activity among the elected candidates was negatively associated with age. The coefficient for education is positive and significant, indicating that candidates with higher educational attainment are more likely to have a public Twitter account. Incumbent is also positively associated with having a public Twitter account. Finally, for party affiliation, PKS affiliation is positively associated with having a public Twitter account at the 1 percent level. The coefficient for PKB affiliation is also positive and significant, albeit at the 10 percent level.

Looking at Twitter activity before the campaign period in Column 2 in Table 4, the picture resembles that of public Twitter accounts. Age is negatively associated with Twitter activity, while education and incumbency are both positively associated with Twitter activity. When it comes to party affiliation, only PKS affiliation is significantly related to general Twitter activity. Finally, Column 3 in Table 4 presents the results for Twitter activity during the campaign period. The estimated coefficients are similar to those found in the previous estimations. However, education and

incumbency are no longer statistically significant. For party affiliation, PKS affiliation is still highly significant and positively associated with Twitter activity. Interestingly, the estimation also suggests that candidates affiliated with Golkar are significantly less likely to be active on Twitter during the campaign period.

To sum up, the findings in the regression analysis are supported by the initial findings in the previous section. Personal characteristics such as age, educational attainment, and incumbency are related to Twitter activity, even though how we define being active on Twitter affects the results somewhat. Party affiliation is important for Twitter activity, with elected candidates affiliated with PKS being much more likely to use Twitter compared to their peers. In addition, elected candidates from Golkar seem to rely much less on Twitter to engage with their constituencies.

[Table 4 here]

5.3 What Are Politicians Tweeting about?

5.3.1 Twitter Types

As the previous section provided a general picture of Twitter activity across the winning political candidates during the 2014 DPR election, we now take a closer look at what the elected candidates are tweeting about. To sort the extensive information in the full sample of tweets, we identify tweets by content using seven distinct and relevant categories. *Election* tweets includes all tweets with general notes on the 2014 DPR election. *Personal* tweets are those with no specific reference to the election or the job of the candidate. *Religion* tweets are messages that in some form refers to a religion. *Campaign* tweets include an explicit reference to the elected candidate's campaign, such

as a call for a public gathering, etc. *Policy* tweets include a reference to a policy that the political candidate wishes to promote. *Party* tweets are tweets that in some form refers to the elected candidate's party. Finally, *Opponent* tweets include a reference to the candidate's opponent or opponents.

Table 5 displays descriptive statistics for each of the Twitter content types. The most common type is personal tweets. It is important to note that even though a tweet is classified as personal, it does not automatically mean that it has no relevance for the candidate's campaign. The fact that the tweet is made public during the campaign period suggests that the candidate is sending a message that could influence his or her constituency. After personal tweets, the most common content types are policy, election, and party tweets, respectively. The least common content type is religion, suggesting that political candidates opt away from pushing religious issues during their campaigns. For tweets on opponents, one candidate sent out tweets related to his or her opponent no less than 532 times, making up over 68 percent of the total number of tweets in that category. This should be taken into consideration in the multivariate analysis as the sample for opponent tweets is heavily skewed. The total number of tweets made by elected candidates during the campaign period was 26,201. The total number of tweets when summing up the categories amounts to 27,197. The reason this number is larger than the total number of tweets is because a tweet can include content from more than one category.

[Table 5 here]

5.3.2 Twitter Types across Political Parties

Before running regressions on content types, it is interesting to take a closer look at type of tweets across political parties. Table 6 provides an overview of total tweets and the seven categories spread out across the political parties. For total tweets, those elected candidates who are affiliated with PKS tweeted close to 121 tweets on average during the campaign period. As a comparison, those affiliated with PPP tweeted a mere 11.49 tweets on average during the same period. For election tweets, PKB candidates stand out with 6 tweets on average compared to a low 1 tweet on average for PPP candidates. Personal tweets are relatively spread out across the parties, with PPP candidates again displaying a low average. The average number of tweets related to religion, campaign, party, and opponent is low across all parties, with several parties displaying an average of close to zero. One notable exception is the average number of opponent tweets for candidates who are affiliated with PD. However, and as noted earlier, this higher average is primarily driven by one candidate who was unusually active on Twitter during the campaign period. The average number of tweets per candidate for policy-related messages is higher across most parties. Overall, the dispersion of type of tweets across parties is relatively similar to that of the total number of tweets, but there are exceptions which make it relevant to include party affiliation when we analyze drivers of type of tweets in a multivariate model.

[Table 6 here]

5.3.3 Determinants of Twitter Types

Table 7 displays the results of multivariate zero-inflated negative binomial regressions on each type of tweet using the model specified in Equation (2) in Section

4.2. The first column presents the results for total number of tweets during the campaign period. Surprisingly, educational attainment is negatively associated with number of tweets. For party affiliation, only PPP is significantly associated with total number of tweets. With a negative coefficient, the results indicate that members affiliated with PPP post significantly less compared to their peers. Column 2 presents the results for election tweets. Candidates who ran for office in their home province tend to post fewer election tweets. One potential reason for this could be that they already have established a repertoire with their constituents and want to focus on more personal messages in their communication. Candidates with children also tend to tweet more about the election, while candidates who belong to the Muslim faith tend to tweet less than their peers. In addition, incumbency is positively associated with number of election tweets, suggesting that seasoned politicians who are in office tweet more about the election. Finally, PD affiliation is negatively associated and PKB affiliation is positively associated with election tweets. For personal tweets, only education turns out to be significant.

For tweets that include elements of religion, the coefficients for education and PKS affiliation are positive and significant, while the coefficient for Hanura is negative and significant. The significant positive coefficient for PKS affiliation was expected as the party wants Islam to play a central role in public affairs. Looking instead at the estimation for campaign tweets, the picture is very similar to that of election tweets. The coefficients for birth province and religion are again negative and significant, while the coefficient for incumbency is positive and significant. In addition, married elected candidates tend to tweet more on the election. The coefficients for affiliation with PKS, Gerindra, and Nasdem are all positive and significant, showing that affiliation with these parties is related to tweeting about their campaign.

For policy, gender and religion (Islam) are negatively associated with Twitter activity, while being married and incumbency are positively associated with this type of tweets. Affiliation with Golkar, Gerindra, PKB, and PKS is also positively related to the number of policy tweets. For party tweets, being male is again negatively related. Having children and Islam are both positively associated with number of tweets on the candidate's political part. Being affiliated with PKB or PKS is positively related to party tweets, while the coefficient for PPP affiliation is negative and significant. Finally, for tweets on the elected candidates' opponents, the coefficients for age and being married are negative and significant, while the coefficients for having children, educational attainment, incumbency, and Islam are all positive and significant. The coefficients for affiliation with Golkar, PPP, and Hanura are negative and significant, while the coefficient for PKS affiliation is positive and significant. The results for opponent tweets should be treated with some caution however, as they are likely driven by the fact that one elected candidate was responsible for such a large share of the total number of tweets in that category.

[Table 7 here]

The empirical results in this section suggest that personal characteristics have significant explanatory power for how active a candidate is on Twitter. As noted in the preliminary analysis in the previous section, party affiliation is also a significant factor for Twitter activity. Moreover, the types of personal characteristics as well as specific party affiliation that is related to Twitter activity differ depending on the content in the political candidates' tweets.

To make sure that the final model for the count variables in this analysis is the correct specification, the model tests discussed in Section 4.2 are carried out for each regression specification. The results of these tests are displayed in Table 8. The alpha falls within a 95 percent confidence interval that is larger than zero in all cases, which means that the negative binomial regression model should be used instead of the Poisson regression model. Moreover, the likelihood ratio test for alpha = 0 is significant at the 1 percent level for all regressions, indicating that the zero-inflated negative binomial regression model represent an improvement from using the zero-inflated Poisson model. Finally, the Vuong tests for all eight regressions turn out to be significant at the 1 percent level, suggesting that the zero-inflated negative binomial regression model is preferred over the standard negative binomial model.

As mentioned earlier, the only exception to these findings is the specification for opponent tweets. In that case, the zero-inflated negative binomial regression model did not converge properly. We therefore opted for the standard negative binomial regression model instead. As can be seen in Table 8, the negative binomial regression model is still preferred over the Poisson regression model. Once again, the results for opponent tweets should be treated with caution, as the distribution of that content category is very skewed.

[Table 8 here]

6 Conclusion

This article has analyzed and explained how political candidates use Twitter to engage with their electorate during election periods. Focusing on the national

legislative election in Indonesia, the study provides a unique glimpse into the role that social media plays in the democratic process in developing countries.

The empirical analysis revealed important relationships between the propensity for political candidates to be active on social media. Notably, age has significant explanatory power, with younger candidates being significantly more likely to use Twitter. Moreover, education is positively related to the use of Twitter among political candidates. Finally, candidates belonging to certain political parties, primarily PKS, are more prone to be active on Twitter. In terms of content, tweets of a personal character are the most common. However, a relatively large number of tweets also contained information on issues related to the election process, in particular the election in general, policy issues, and the candidate's political party. The empirical analysis also revealed how different personal characteristics among the political candidates are associated with different types of content.

To the best of our knowledge, this is the first study that utilizes an extensive data set on the use of social media during a national election period in Indonesia. The Indonesian people have embraced the use of a variety of social media platforms during the last five years, thus making the question of what role social media plays in the political process is important. In addition, the study provides an opportunity for comparative analysis, as most previous studies have focused on political candidates and their use of social media during elections in the West (e.g. Gainous and Wagner, 2014).

While this study represents a first important step for improving our understanding of social media in Indonesian politics, it has certain limitations. This suggests that there is a need for more studies that apply a rigorous empirical approach to the analysis of this topic. There are several directions in which future research may

extend the analysis in this paper. For example, while this study has provided a detailed analysis on the legislative election at the national level, future studies on the provincial and *kabupaten*/*kota* levels would likely produce important insights into how social media is used in the local political process. In addition, while this study has focused on how political candidates utilize social media, a better understanding of other participants in the political process use social media and the impact this has on the process itself is important. For example, the electorate may engage in dialogue with politicians, opinion makers, and other members of the electorate over social media. This type of dialogue can have a significant effect on the outcome in elections. In addition, political parties and different types of political actors may influence elections by engaging with the electorate over social media.

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Table 1. Electoral Districts and DPR Seats

Province	Electoral Districts	DPR Seats
Aceh	2	13
North Sumatra	3	30
West Sumatra	2	14
Riau	2	11
Riau Islands	1	3
Jambi	1	7
South Sumatra	2	17
Bangka–Belitung Islands	1	3
Bengkulu	1	4
Lampung	2	18
Jakarta	3	21
West Java	11	91
Banten	3	22
Central Java	10	77
Yogyakarta	1	8
East Java	11	87
Bali	1	9
West Nusa Tenggara	1	10
East Nusa Tenggara	2	13
West Kalimantan	1	10
Central Kalimantan	1	6
South Kalimantan	2	11
East Kalimantan	1	8
North Sulawesi	1	6
Gorontalo	1	3
Central Sulawesi	1	6
South Sulawesi	3	24
Southeast Sulawesi	1	5
West Sulawesi	1	3
Maluku	1	4
North Maluku	1	3
Papua	1	10
West Papua	1	3
Total	*77*	*560*

Note: The table displays the number of electoral districts and the number of DPR seats in each province in the 2014 legislative election.

Table 2. Summary Statistics

	Mean	Std.Dev.	Min	Max
Age	48.24	9.27	25	75
Children	2.94	1.75	0	11
Education	3.43	0.60	2	4
Gender	0.83	0.38	0	1
Married	0.94	0.24	0	1
Incumbency	0.35	0.48	0	1
Birth Province	0.65	0.48	0	1
	Number	**% of sample**		
Religion				
Islam	472	84.29%		
Christian (Protestant)	57	10.18%		
Catholic	18	3.21%		
Buddhism	3	0.54%		
Hinduism	10	1.79%		
Party				
PDI-P	109	19.46%		
Golkar	91	16.25%		
Gerindra	73	13.04%		
PD	61	10.89%		
PAN	49	8.75%		
PKB	47	8.39%		
PKS	40	7.14%		
PPP	39	6.96%		
Nasdem	35	6.25%		
Hanura	16	2.86%		

Note: Age is the age of the elected candidate. Children is the number of children the elected candidate has. Education is educational attainment, which is classified as 1 = primary school, 2 = secondary school, 3 = high school, 4 = university degree, and 5 = graduate degree. Gender is the gender of the candidate, with 1 = male and 0 = female. Married is equal to 1 if the elected candidate is married and zero otherwise. Incumbency is equal to 1 if the elected candidate is an incumbent and zero otherwise. Birth province is equal to 1 if the elected candidate is running for office in his or her birth province and zero otherwise. The political parties are: Indonesian Democratic Party – Struggle (*Partai Demokrasi Indonesia Perjuangan*, PDI–P); Party of the Functional Groups (*Partai Golongan Karya*, Golkar); Great Indonesia Movement Party (*Partai Gerakan Indonesia Raya*, Gerindra); Democratic Party (Partai Demokrat, PD); National Mandate Party (*Partai Amanat Nasional*, PAN); National Awakening Party (*Partai Kebangkitan Bangsa*, PKB); Prosperous Justice Party (*Partai Keadilan Sejahtera*, PKS); United Development Party (*Partai Persatuan Pembangunan,* PPP); Nasdem Party (*Partai Nasdem*, Nasdem); People's Conscience Party (*Partai Hati Nurani Rakyat*, Hanura).

Table 3. Candidates, Parties and Twitter

	Candidates	Active Twitter	Percentage
PDI-P	109	36	33.03%
Golkar	91	16	17.58%
Gerindra	73	18	24.66%
PD	61	16	26.23%
PAN	49	18	36.73%
PKB	47	14	29.79%
PKS	40	26	65.00%
PPP	39	11	28.21%
Nasdem	35	10	28.57%
Hanura	16	7	43.75%
Average	56.00	17.20	33.35%

Note: Candidates are total number of winning candidates during the DPR election. Active Twitter is the total number of winning candidates who tweeted at least once during the pre-election period. Percentage is the ratio of total candidates who tweeted at least once during the pre-election period to total winning candidates.

Table 4. Twitter Activity

	Public Account	Before Pre-Election	Pre-Election
Gender	0.10	0.15	-0.09
	(0.25)	(0.24)	(0.25)
Age	-0.31*	-0.37**	-0.67***
	(0.19)	(0.19)	(0.20)
Birth Province	-0.23	-0.19	0.16
	(0.20)	(0.19)	(0.21)
Married	0.04	0.22	0.28
	(0.44)	(0.44)	(0.46)
Children	-0.24	0.54	0.09
	(0.40)	(0.40)	(0.42)
Education	0.66*	0.78**	0.67
	(0.37)	(0.40)	(0.47)
Incumbency	0.35*	0.56***	0.07
	(0.21)	(0.20)	(0.22)
Religion	-0.37	-0.05	-0.02
	(0.27)	(0.27)	(0.29)
Political Party			
Golkar	0.16	-0.19	-0.82**
	(0.30)	(0.30)	(0.35)
Gerindra	0.27	-0.14	-0.36
	(0.33)	(0.32)	(0.36)
PD	0.02	-0.51	-0.43
	(0.34)	(0.34)	(0.37)
PAN	0.47	0.38	0.09
	(0.39)	(0.39)	(0.37)
PKB	0.76*	0.03	-0.27
	(0.40)	(0.38)	(0.41)
PKS	1.38***	1.07**	1.35***
	(0.51)	(0.45)	(0.44)
PPP	-0.45	-0.58	-0.23
	(0.40)	(0.41)	(0.43)
Nasdem	0.62	-0.31	-0.05
	(0.44)	(0.43)	(0.45)
Hanura	-0.01	-0.21	0.37
	(0.55)	(0.54)	(0.68)
Constant	0.30	-1.43**	-1.39**
	(0.60)	(0.60)	(0.69)
Pseudo R^2	0.05	0.06	0.07
N	560	560	560

Note: Table entries are logit estimates with associated robust standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 5. Twitter Types

	Number	Mean	Max	# Candidates	% Candidates
Total Tweets	26201	46.79	1324	172	30.71%
Election	2543	4.54	363	120	21.43%
Personal	17693	31.59	820	161	28.75%
Religion	544	0.97	97	75	13.57%
Campaign	729	1.30	70	95	16.96%
Policy	2831	5.06	260	101	18.04%
Party	2078	3.71	216	114	20.36%
Opponent	779	1.39	532	45	8.04%
Total	*27197*	*48.57*			

Note: The table displays the total number of each type of tweet content made public during the pre-election period (January 1, 2014 to the day of the elections, April 9, 2014). It also displays the mean and maximum of each type of tweet. # Candidates is the number of candidates that posted at least one tweet in the specific category during the pre-election period. % Candidates is the percentage of the total number of winning candidates that posted at least one tweet in a specific category during the pre-election period. Each tweet can include more than one type of content.

Table 6. Types of Tweets across Political Parties

	Total Tweets		Election		Personal		Religion	
	Total	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**
PDI-P	4511	41.39	686	6.29	2912	26.72	47	0.43
Golkar	3221	35.40	361	3.97	2395	26.32	27	0.30
Gerindra	2272	31.12	249	3.41	1464	20.05	84	1.15
PD	2308	37.84	96	1.57	1372	22.49	24	0.39
PAN	2155	43.98	170	3.47	1731	35.33	19	0.39
PKB	3379	71.89	512	10.89	2213	47.09	50	1.06
PKS	4839	120.98	260	6.50	2896	72.4	260	6.50
PPP	448	11.49	39	1.00	356	9.13	26	0.67
Nasdem	1994	56.97	98	2.80	1577	45.06	4	0.11
Hanura	1074	67.13	72	4.50	777	48.56	3	0.19
Total / Av	**26201**	**51.82**	**2543**	**7.58**	**17693**	**35.31**	**544**	**0.98**

	Campaign		Policy		Party		Opponent	
	Total	**Average**	**Total**	**Average**	**Total**	**Average**	**Total**	**Average**
PDI-P	85	0.78	569	5.22	308	0.00	85	0.78
Golkar	66	0.73	382	4.20	97	0.05	9	0.10
Gerindra	73	1.00	314	4.30	183	0.06	15	0.21
PD	40	0.66	134	2.20	160	0.04	539	8.84
PAN	50	1.02	117	2.39	90	0.05	13	0.27
PKB	55	1.17	335	7.13	450	0.15	10	0.21
PKS	277	6.93	645	16.13	573	0.40	100	2.50
PPP	14	0.36	45	1.15	17	0.03	0	0
Nasdem	54	1.54	137	3.91	137	0.11	8	0.23
Hanura	15	0.94	153	9.56	63	0.60	0	0
Total / Av	**729**	**1.51**	**2831**	**5.10**	**2078**	**0.15**	**779**	**1.31**

Note: The table displays the total number of each type of tweet content made public by candidates from each party during the pre-election period (January 1, 2014 to the day of the elections, April 9, 2014). It also displays the average number of tweets for each type and party during the pre-election period. The final row shows the total number of tweets by type as well as the average number of tweets by type for each party.

Table 7. Determinants of Twitter Types

	Total	Election	Personal	Religion	Campaign	Policy	Party	Opponent
Gender	0.22	-0.40	0.36	0.65	-0.1	-0.84*	-0.67*	0.79
	(0.34)	(0.31)	(0.35)	(0.44)	(0.30)	(0.47)	(0.37)	(0.59)
Age	-0.14	0.22	-0.24	0.33	0.03	0.25	-0.09	-1.03**
	(0.23)	(0.22)	(0.25)	(0.25)	(0.25)	(0.32)	(0.28)	(0.44)
Birth Province	-0.22	-0.57**	-0.30	-0.37	-0.62**	0.12	-0.14	0.99**
	(0.26)	(0.27)	(0.26)	(0.30)	(0.26)	(0.29)	(0.32)	(0.45)
Married	-0.53	0.29	-0.73	0.66	0.93*	2.12***	-0.06	-4.30***
	(0.57)	(0.39)	(0.63)	(0.82)	(0.51)	(0.81)	(0.80)	(1.23)
Children	-0.15	0.64*	-0.18	0.01	-0.29	-0.71	1.40***	3.17***
	(0.45)	(0.38)	(0.51)	(0.97)	(0.54)	(0.76)	(0.51)	(1.15)
Education	-1.27**	-0.33	-1.24**	1.28**	0.00	0.62	0.46	3.27***
	(0.64)	(0.60)	(0.62)	(0.60)	(0.59)	(0.78)	(0.76)	(0.77)
Incumbency	0.12	0.40*	0.01	0.18	0.51**	0.80**	0.02	1.26***
	(0.24)	(0.25)	(0.25)	(0.30)	(0.22)	(0.36)	(0.26)	(0.45)
Religion	-0.35	-0.89**	-0.16	-0.59	-0.75**	-1.22***	0.75**	2.31***
	(0.35)	(0.41)	(0.33)	(0.47)	(0.33)	(0.39)	(0.38)	(0.66)
Political Party								
Golkar	0.51	0.62	0.53	-0.03	0.53	0.87*	-0.41	-1.73***
	(0.36)	(0.43)	(0.39)	(0.51)	(0.39)	(0.50)	(0.43)	(0.63)
Gerindra	-0.11	0.39	-0.29	0.12	0.89*	1.40**	0.17	-0.71
	(0.37)	(0.47)	(0.37)	(0.53)	(0.48)	(0.64)	(0.54)	(0.84)
PD	0.09	-0.63**	-0.04	-0.10	-0.03	-0.66	0.23	0.46
	(0.42)	(0.31)	(0.38)	(0.52)	(0.33)	(0.43)	(0.46)	(0.91)
PAN	-0.59	-0.36	-0.45	-0.56	0.23	0.30	-0.18	-0.68
	(0.45)	(0.54)	(0.46)	(0.48)	(0.48)	(0.55)	(0.48)	(0.76)
PKB	0.67	1.56***	0.46	0.41	0.63	1.77**	1.40**	-0.68
	(0.50)	(0.59)	(0.50)	(0.69)	(0.57)	(0.82)	(0.56)	(0.107)
PKS	0.51	-0.44	0.41	0.79*	1.02***	0.84*	0.92**	2.02***
	(0.34)	(0.35)	(0.37)	(0.45)	(0.35)	(0.44)	(0.43)	(0.66)
PPP	-0.85*	-0.6	-0.80	0.45	-0.23	0.18	-0.92*	-15.99***
	(0.50)	(0.47)	(0.53)	(0.45)	(0.38)	(0.82)	(0.51)	(1.14)
Nasdem	0.78	0.63	0.77	-1.20*	1.26*	1.11	0.79	1.13
	(0.54)	(0.61)	(0.56)	(0.62)	(0.71)	(0.73)	(0.60)	(0.88)
Hanura	0.45	-0.34	0.44	-1.52***	-0.06	0.67	-0.27	-17.57***
	(0.49)	(0.54)	(0.44)	(0.54)	(0.42)	(0.87)	(0.56)	(0.71)
Constant	6.94***	3.49***	6.66***	0.88	1.71**	1.88*	2.09**	-2.28**
	(0.80)	(0.73)	(0.80)	(0.84)	(0.81)	(0.96)	(0.86)	(1.06)
Wald chi2	33.04	42.85	33.00	70.97	48.82	54.43	53.44	1256.13
Prob > chi2	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Pseudo R2								0.10

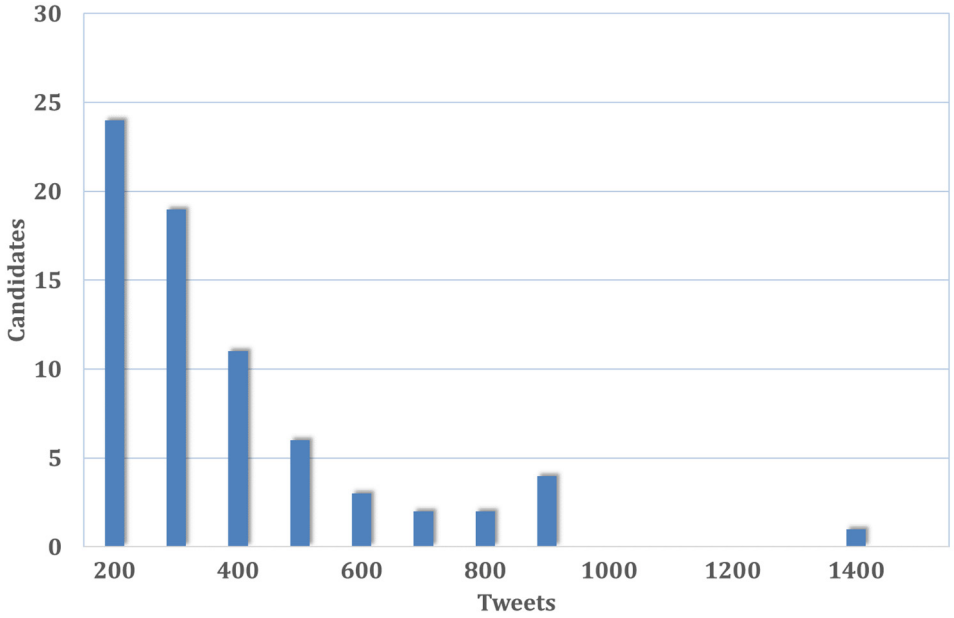
Note: Table entries are zero-inflated negative binomial regression (standard negative binomial regression for Opponent) estimates with associated robust standard errors in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Table 8. Count Data Model Tests

	Total				Election			
	Coef.	Std.Err	95% Conf. Interval		Coef.	Std.Err	95% Conf. Interval	
alpha	1.87	0.13	1.63	2.15	1.15	0.12	0.95	1.40
	Chibar2	Pr≥chibar2			Chibar2	Pr≥chibar2		
alpha = 0	34000.00	0.00			2860.64	0.00		
	z	Pr>0			z	Pr>0		
Vuong test	35.80	0.00			19.84	0.00		
	Personal				**Religion**			
	Coef.	Std.Err	95% Conf. Interval		Coef.	Std.Err	95% Conf. Interval	
alpha	1.68	0.13	1.45	1.95	0.71	0.13	0.49	1.02
	Chibar2	Pr≥chibar2			Chibar2	Pr≥chibar2		
alpha = 0	21000.00	0.00			304.15	0.00		
	z	Pr>0			z	Pr>0		
Vuong test	33.31	0.00			13.42	0.00		
	Campaign				**Policy**			
	Coef.	Std.Err	95% Conf. Interval		Coef.	Std.Err	95% Conf. Interval	
alpha	0.69	0.09	0.54	0.89	1.57	0.14	1.31	1.87
	Chibar2	Pr≥chibar2			Chibar2	Pr≥chibar2		
alpha = 0	366.06	0.00			3518.32	0.00		
	z	Pr>0			z	Pr>0		
Vuong test	16.33	0.00			18.75	0.00		
	Party				**Opponent**			
	Coef.	Std.Err	% Conf. Interval		Coef.	Std.Err	95% Conf. Interval	
alpha	1.27	0.11	1.07	1.52	24.74	4.43	17.41	35.15
	Chibar2	Pr≥chibar2						
alpha = 0	2246.27	0.00						
	z	Pr>0						
Vuong test	19.59	0.00						

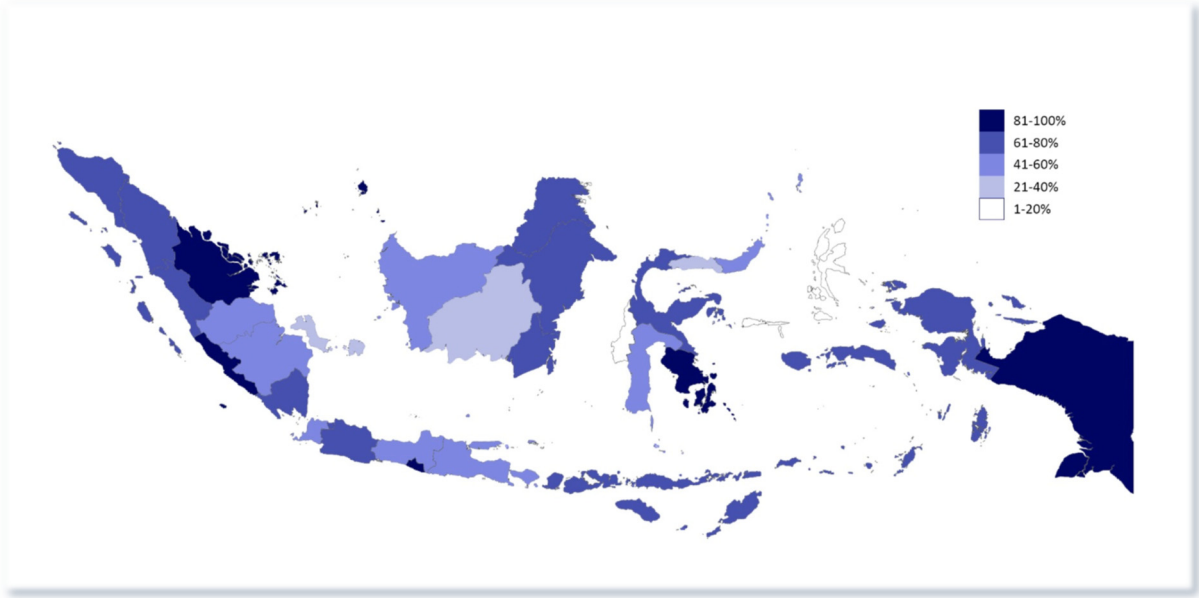
Note: The significance of alpha determines whether it is better to use a negative binomial regression model or a Poisson regression model. If the alpha coefficient is zero, a Poisson model is preferred. Alpha=0 is a likelihood ratio test for the zero-inflated negative binomial regression model versus the zero-inflated Poisson regression model. A significant test result indicates that the zero-inflated negative binomial regression model is preferred. The Vuong test compares the zero-inflated negative binomial regression model with a standard negative binomial regression model. A significant z-test indicates that the zero-inflated negative binomial regression model is preferred. Since alpha=0 and Vuong tests cannot be performed for estimations with robust standard errors, the results displayed in the table are for estimations without robust standard errors.

Figure 1. Distribution of Total Twitter Use during the Election Period



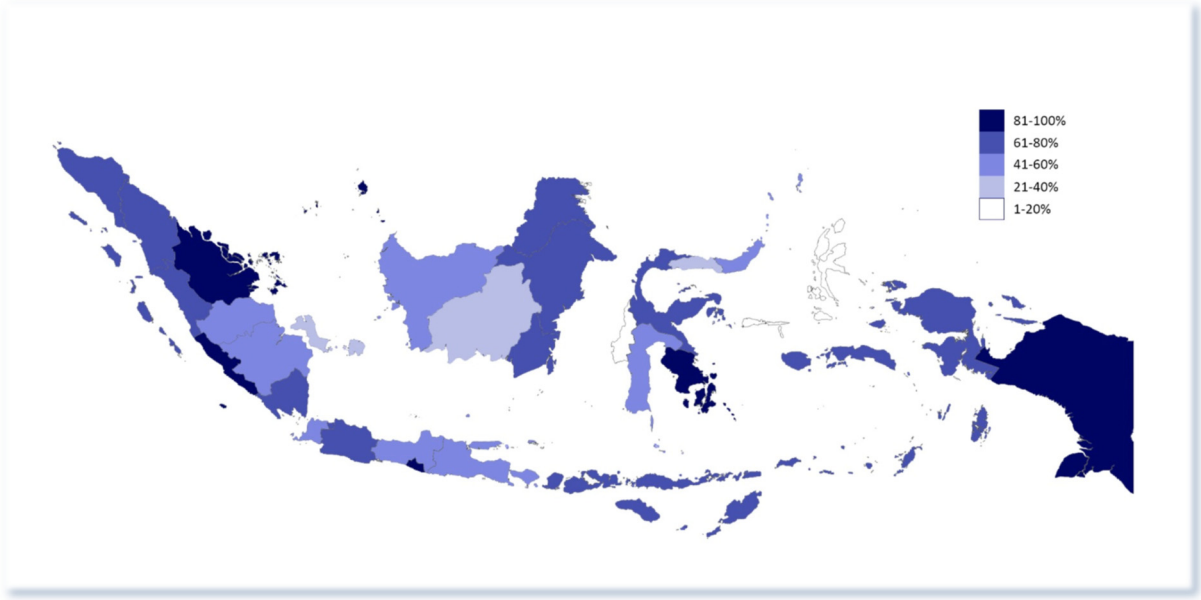
Note: The chart displays the number of candidates within each cohort based on number of tweets. For example, 200 depicts the number of candidates who tweeted between 1 and 200 times during the election period.

Figure 2. Winning Candidates with a Public Twitter Account



Note: The map shows the ratio of number of winning candidates with a public Twitter account at the time of the elections to the total number of winning candidates in each province.

Figure 3. Winning Candidates with Pre-Election Tweets



Note: The map shows the ratio of number of winning candidates who tweeted during the period January 1, 2014 to the day of the elections (April 9, 2014) to the total number of winning candidates in each province.

Figure 4. Active on Twitter during Pre-Election across Personal Characteristics

Note: Percentage of individuals who tweeted during the period January 1, 2014 to the day of the elections (April 9, 2014) across personal characteristics.