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Voting and protest tendencies associated with changes in service delivery

Tina Fransman^{1,2}

Abstract

Citizens ought to hold the state accountable for service delivery. This is usually done through the power of the vote. Literature on democratic governance suggests that theoretically, when good quality public services are provided, citizens would continue to vote for the political party in power. Therefore, it is expected that the inverse would occur should poor quality public services be provided. However, surprising evidence has recently emerged to suggest that political accountability does not work as theory assumes, indicating a negative relationship between improvements in public service provision and support for the incumbent for Southern African democracies. Using a unique panel dataset, this study tests whether a breakdown in the relationship between public service delivery and voting behaviour in South Africa indeed exists. It further investigates whether this distortion is the result of South Africans' preference to access other forms of political participation as a more effective route to political accountability, rather than voting in elections. The results seem to broadly confirm a breakdown in the relationship between improvements in public service provision and voting behaviour in South Africa. The findings suggest that South Africans consider protest action as an alternative route to political accountability. Furthermore, regression results provide some evidence to support the notion of spoiled ballots being a plausible alternative accountability route.

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1. Introduction

Worldwide, cities are becoming more densely populated, and with that there is an increase in the pressure placed on governments to improve the efficiency of their service delivery. Improving public service delivery is considered one of the biggest challenges globally, but it is also deemed an important poverty reduction strategy (Besley & Ghatak, 2007:127). Conventional theoretical public economics has largely focused on setting taxes and public expenditure levels, while little attention has been given to the mechanism of public service delivery. In economics, it is commonly thought that the private sector provides private goods efficiently while the public sector intercedes to correct externalities by providing public goods and services, using taxes or subsidies. However, public service delivery has become increasingly unsatisfactory for several reasons including the fact that evidence of government failure has been mounting, particularly in developing countries (Besley & Ghatak, 2007:128).

Service delivery is vital for development. While organizing public service provision is a core function of government, the delivery of public services occurs through a nexus of relationships between service providers, politicians, and beneficiaries (Besley & Ghatak, 2007:133). If these basic services work for the people, it implies that a government is meeting its responsibilities towards its citizens. Nevertheless, failure in service provision occurs worldwide. Inadequate accountability and a lack of local control are understood to be the underlying determinants of poor quality public service provision in many developing countries (Björkman Nyqvist, De Walque, & Svensson, 2017:33). The real question this poses relates to how citizens hold government accountable for its failures in the provision of public services?

One route to accountability is through elections, which may also be referred to as electoral accountability or political accountability. Political accountability is a central tenet of democratic governance. It essentially refers to citizens periodically electing their government officials, who are directly responsible to voters for their public actions. These actions include, but are not limited to, the provision of public goods and services (Acosta, Joshi & Ramshaw, 2010:12). This is considered a measure of democratic quality and is necessary to ensure that democratic systems remain sustainable (Brinkerhoff, 2001:5).

According to the World Bank (2011:26), even though elections may be considered the most powerful mechanism to hold government accountable, they are periodic. Therefore, in order to

really foster accountability, several additional voice mechanisms³ are required. This implies that elections as a route to accountability often fail on their own. Similarly, in some settings such as in the case of certain Southern African democracies, there is evidence to suggest that accountability through the mechanism of voting is distorted.⁴ Possible reasons for this breakdown in elections as an accountability mechanism may be presented by various theoretical underpinnings ranging from the party identification model and the sociological model to rational choice theory and informational asymmetries, all of which are discussed in greater detail later on.

The notion of voting as an instrument to enforce accountability over politicians was contradicted by de Kadt and Lieberman (2017) whose findings between 1999 and 2011 suggest that electoral accountability does not always work as theorised in the South African context. Surprisingly, by analysing the relationship between service provision and voting, their findings suggested a negative or precisely null relationship in support for the dominant party incumbent, given improvements in service provision. The overall implication of these findings thus challenged the standard theories of electoral accountability. There is a lack of local studies that interrogate these findings. This provides an opportunity to address the gap by testing the accountability hypothesis for a later period, and update and expand the findings by de Kadt and Lieberman (2017).

The aim of this study is to provide an empirical answer to the question of whether accountability through the mechanism of voting fails due to the existence of alternative accountability mechanisms, all of which are answered within the South African context. In the context of this paper, three alternative accountability mechanisms are explored. The main analysis is split into two parts with progress in public service delivery denoted as an indicator of government performance. First, accountability through elections is tested by determining whether citizens use their vote to sanction or reward government based on their ability to provide public service delivery. Second, accountability by way of protest action is tested by determining whether the electorate sanctions government for poor performance by increasing the frequency of protests, and whether they reward government for good performance by

³ Voice mechanisms refer to the political voice of citizens, used as a means to influence policy design and shape priorities by politicians (World Bank, 2011:9). Examples of additional voice mechanisms include citizen report cards and participatory budgeting (World Bank, 2011:26).

⁴ For example, see de Kadt and Lieberman (2017), von Fintel and Ott (2017), and Schulz-Herzenberg (2009).

decreasing the frequency of protest action. The main analysis therefore ultimately touches on both conventional and unconventional political participation in South Africa. The data used in this study are obtained from the most recent available Census, Community Survey (CS), Independent Electoral Commission (IEC) (voting data) and corresponding Armed Conflict Location and Event Data Project (ACLED) (protest data). These datasets are merged to create a unique two-wave panel dataset, where t_1 is 2011 and t_2 is 2016.

While the majority of the electorate may vote in a meaningful way, not all voters follow this process and abstain in two ways, namely: non-voting and invalid voting (Martinez & Werner, 2018:1). Therefore, to give a more holistic view of alternative routes to accountability, this research introduces two other probable routes: voter turnout, and spoiled ballots.⁵ The intention is to frame these two alternatives as a possible channel of silent protest.⁶

This paper also gives an indication of the change in public service delivery coverage over the five-year period under study. Public service delivery here specifically refers to water provision, refuse collection and sewerage provision. Overall, the results seem to broadly confirm the findings by de Kadt and Lieberman (2017) as there is evidence to suggest a breakdown in the relationship between improvements in service provision and voting behaviour. However, given the data, acknowledging that the dominant party incumbent during local elections in South Africa is not only the African National Congress (ANC), gives rise to surprising new evidence of a positive relationship between improvements in public service delivery and incumbent vote share for a very specific service deemed rather unique in the context of this study.

There seems to be evidence to support the notion that South Africans consider protest action an alternative route to political accountability. This is supported by the finding that improvements in public service delivery is likely to bring about a decrease in the number of protests that occur. The results pertaining to voter turnout and spoiled ballots appear to be mixed but cannot be dismissed as probable alternative accountability routes. Furthermore, these results also contribute to the ongoing debates about what voter turnout and spoiled ballots truly signal in a democratic context.

⁵ Voter turnout and spoiled ballots are more conventional in nature and are related to voter behaviour.

⁶ Silent protest in the context of this paper refers to voter turnout as a means to capture non-voting, and spoiled ballots as a means to capture invalid voting.

This study firstly updates and expands the findings of de Kadt and Lieberman (2017), in the South African context using more recent data. Given that there are so few studies⁷ that empirically examine whether electoral accountability works as the theory assumes, in South Africa, this research contributes new and surprising findings and adds to the body of literature relating to electoral accountability. Secondly, this paper contributes a new empirical answer to the question of whether South Africans use protest action to hold government accountable for public service delivery. Thirdly, it introduces and empirically tests voter turnout and spoiled ballots as potential alternative routes to enforce political accountability. Finally, this study brings to light how certain services when compared with others, seem to be much stronger predictors of particular forms of political participation than other services.

2. Accountability mechanisms

Elected representatives exercise public authority in both the policymaking and legislative branches of government but remain subordinate to the definitive sovereignty of citizens via the democratic electoral process. The exercise of state power should only be conducted on the behalf of citizens and not according to an elected representative's own accord. This means that government representatives are always accountable to citizens, who evaluate the representatives' exercise of power and vote them out of office if they so desire (Aucoin & Jarvis, 2005:12). For this reason, regular elections are viewed as an important accountability mechanism as it allows citizens to decide whether to extend a particular party's tenure. The risk of loss of office encourages governments to be more reactive to the desires and requests of the electorate. Governments are defined as 'accountable' in the event where citizens are able to distinguish representative governments from unrepresentative governments and can sanction them accordingly, ousting incumbents who do not perform well while retaining incumbents with good performance (Schulz-Herzenberg, 2009:1).

A formal accountability relationship is formed between policy makers and citizens by means of competitive elections, which in turn promotes better governance (Ashworth, 2012:184).

⁷ The only other similar study known to the author at the time of writing is by Schulz-Herzenberg (2009).

Political economy literature⁸ suggests that when electoral competition is present, governments have greater incentive to redistribute public goods and services in order to satisfy their electorate (Kroth, 2014:11). Voting, for the most part, is considered the only way in which most citizens in democracies participate in politics. As a result, it is viewed as the most conventional form of political participation (Kotzé, 2001:137). It should, however, be noted that even though elections are considered a legitimate mechanism to foster political accountability, political scientists have increasingly emphasised a decline in citizen involvement and participation since the 1990s as suggested by diminishing voter turnout. Evidence⁹ suggests that citizens show declining levels of political interest, political trust, and party identification over time.¹⁰

Despite the trend of diminishing voter turnout, academics have observed that citizens have developed numerous innovative ways to engage in politics, based on approaches that citizens find more direct, efficient, and meaningful (Stolle & Hooghe, 2009:9). According to Linssen Schmeets, Scheepers, and Grotenhuis (2011:2) there is evidence to suggest western democracies are suffering under the yoke of ‘citizen withdrawal’ from conventional forms of political participation. However, they note that there is a simultaneous counteracting trend that many might view in a more positive light. This is the rise in citizen participation in more unconventional forms of political participation. Samuel and Godwyns (2011:5) describe conventional political participation as being institutional, routine and a more common. Conversely, they define unconventional political participation as being more uncommon in nature and considered inappropriate or controversial by some. To differentiate between conventional and unconventional political participation some examples of each are listed in Table 1 below.

Various arguments for the decline in conventional political participation have emerged in the literature. These range from the notion that unconventional political activities compensate for decreases in electoral and party politics, to the belief that citizens increasingly consider

⁸ See Lake and Baum (2000); Bueno de Mesquita Smith, Siverson, and Morrow (2003); Stasavage (2005); Blaydes and Kayser (2011); Kudamatsu (2012).

⁹ See Torcal (2014) and Dalton (2004).

¹⁰ Although this trend has recently been reversed in the USA, with their recent elections.

unconventional forms of participation a more effective means to exert pressure on the political decision-making process.¹¹

Table 1: Examples of conventional versus unconventional political participation

Conventional political participation	Unconventional political participation
Voting	Signing a petition
Volunteering	Protests
Attending political rallies	Boycotts
Running for office	Peaceful demonstrations
Joining groups	Joining strikes
Campaigning for a political party	Using force or violence for any political cause

Source: Adapted from Samuel and Godwyns (2011:5) and von Fintel and Ott (2017:88)

Since elections are considered a formal procedure that only occur periodically, there has been increased emphasis on unconventional accountability mechanisms to sustain political accountability. According to Acosta *et al.* (2010:13) the beauty of unconventional political participation¹² is that it is not constrained to certain time periods and detailed procedures, which allows for the facilitation of a continuous relationship with citizens concerning their demands. Moreover, it allows citizens to exert direct political influence on government officials, with the intention of obtaining increased and effective government intervention in the short run. Bearing this in mind, another plausible reason for a breakdown in elections as a single route to accountability may be attributed to voters opting to use alternative accountability routes. Within the South African context, Booysen (2007) makes out a case for why this would be true in South Africa, where there is rather a “dual-action repertoire” of political behaviour. Booysen (2007) suggests that South Africans view voting and protest action as complementary activities to attain service delivery.¹³

Despite the relative trust of citizens in post-apartheid South African government and their satisfaction with democracy, the quality of basic service provision and the general economic situation in South Africa have come under the spotlight.¹⁴ As stated by the World Bank (2011:28), South Africa displays a complex paradox in that the incumbent voter returns are comfortable in local government elections, but simultaneously, many township and village

¹¹ For examples, see Zukin, Keeter, Andolina, Jenkins, and Della (2006), Ekiert and Kubik (2001), Tilly and Tarrow (2007), Linssen *et al.* (2011)

¹² Acosta *et al.* (2010) uses the term social accountability instead of unconventional political participation.

¹³ In the study by Booysen (2007) service delivery refers to ‘commodities’ such as water, electricity and sanitation.

¹⁴ For example, see Alexander (2010), Mashamaite (2014) and Akinboade, Mokwena and Kinfack (2014)

protests have occurred as an expression of anger against the incumbent regarding service delivery. This therefore implies that even though citizens can vote their preferred local government representatives in and out of office, this power may not always be utilized as it should be. Given the legacy of the apartheid regime, as stated by Booysen (2007:31) the majority of South Africans still trust the ANC more than any other political party. Therefore, citizens would rather opt to enforce accountability by means of protest, if and when required, than to see another party in power. South Africa thus provides an interesting political setting for investigating political accountability, public service delivery and political participation.

3. Service delivery, voter behaviour and protest action in South Africa

Service delivery is a major theme stressed by the electorate worldwide. A breakdown in service delivery can have an undesirable impact on economic and social development (IDASA, 2010:8). For effective and efficient delivery of services, especially the delivery of public goods, leadership and good governance are normally regarded as critical requirements (Matshabaphala, 2015:497). South Africa is a constitutional democracy with a three-tiered system of government: national, provincial, and local. These tiers function in an interrelated and interdependent manner (Lehohla, 2016:1). By aligning sub-national government expenditure with local as well as regional priorities, the main objective of fiscal decentralization in South Africa is to improve service delivery efficiency (Elhiraika, 2007:9). Since local government is the lowest tier and often referred to as the most basic unit of government, it is responsible for the provision of basic services and development in the region under its control. Tangible basic services are defined as being visible to citizens while intangible basic services¹⁵, although essential, are not necessarily observable (Ndudula, 2013:10).

The post-apartheid South African government has gone to great lengths to ensure increased public spending for the provision of basic services along with better targeting of these services, especially to those who were previously disadvantaged (World Bank, 2011:13). Despite this,

¹⁵ Examples of tangible municipal services include but are not limited to roads, water, sanitation systems, public transport, and housing. Sewerage, public safety standards and public drainage are intangible services. In the context of this dissertation, municipal services are narrowed down to three services: water, refuse collection and sewerage.

local government has not always been successful in the delivery and continued maintenance of basic services, which in turn have led to great inconvenience and in some cases posed a threat to local communities (Reddy, 2016:1). In fact, a large body of literature has emerged identifying persisting public service delivery challenges faced by South Africa over the years.¹⁶ The South African government's tardiness in the provision of basic services to its citizens and numerous unfulfilled promises have caused much frustration and public service delivery protests among its citizens (Masuku & Jili, 2019:2). Due to the inability of government to provide the services that the majority of South Africans have waited for, the exuberance that accompanied the dawn of democracy has now been replaced by growing signs of despair (Nengwekhulu, 2009:341).

The fall of apartheid in South Africa saw the ANC rise to dominance. By virtue of the ANC's historic role in the liberation movement, no opposition party has been able to develop the type of legitimacy the ANC has acquired. This suggests that opposition parties in South Africa have never really posed a notable threat to ANC dominance (Wieczorek, 2012:30). Since 1994, elections have been entirely predictable to many, due to the ANC's symbolic history as the party of liberation. This is a label that has allowed them to win the majority of votes in elections irrespective of how the party performs (Wieczorek, 2012:30). The inert and predictable nature of voting outcomes, accompanied by electoral imbalances in the party system have raised concerns that elections fail to act as an accountability mechanism, which evokes deeper concern about the quality of democracy (Schulz-Herzenberg, 2009:2).

What determines political accountability lies at the root of democratic responsiveness and political representation. It is a question that is often answered in the context of reward-punishment theories of retrospective voting: when times are good, voters reward the incumbent and when circumstances change for the worse, voters opt to punish the incumbent for poor performance (Hellwig & Samuels, 2008:67). The most basic and accessible way in which citizens can achieve this is via periodic elections, where citizens must be ready to base their vote on whether they are satisfied with the actions of government. Conversely, they should supposedly be ready to possibly change their vote should they be unsatisfied with government performance (Mattes, Taylor & Africa, 1999:235). This idea of reward-punishment theory as a means to promote political accountability might in essence sound straightforward but in reality,

¹⁶ For example, see Koma (2010), Mpehle (2012), Nengwekhulu (2009), Steyn Kotze and Taylor (2010).

it is quite the opposite, particularly in South Africa's instance. Even though many South Africans seem to express growing dissatisfaction with the quality of public service delivery, scholars have advised that the legacies of apartheid and colonialism endorse obstinate and persisting ethnic and racial cleavages that inform electoral behaviour. Thus, to some degree, voters *themselves* are the reason for the predictability of electoral results (Schulz-Herzenberg, 2009:2).

Schoeman and Puttergill (2006:154) mention three important theoretical underpinnings which are used to provide some insight as to why reward-punishment theory in relation to voting behaviour may be distorted. First, reference is made to the party identification model, which fundamentally refers to voting behaviour that is based on loyalty to a specific political party. Bringing this theory into context, Schulz-Herzenberg (2009:2) describes the instance where economic and political performance by the ANC government, whether good or bad has little impact on voters and acknowledges that an indifferent majority of voters is dire for political accountability. Second, voter behaviour is influenced by sociological factors including but not limited to social class, religious affiliation, gender, age, and ethnic loyalties. This is referred to as the sociological model and emphasises group membership of the voter. Voting behaviour based on any form of ascriptive identities hinders the quality of democracy. It also results in voters being unable to respond to the 'political market' formed by the presence of several political parties, in the event that they are restrained by intense cleavage identities (Schulz-Herzenberg, 2009:2). Third, Schoeman and Puttergill (2006:154) address rational choice theory. This theory assumes that the behaviour of individuals is motivated by utility maximization, self-interest, or goal fulfilment (Petracca, 1991:289). This theory is based on the notion that citizens use democracy as a means to achieve material benefit instead of self-expression (Schoeman and Puttergill, 2006:154).

A further theoretical underpinning for a distortion in voting as an accountability mechanism highlights asymmetric information between citizens and government, in which voters lack proper information regarding the quality of the incumbents' performance (Besley & Burgess, 2001:630).¹⁷ This theoretical underpinning seems to be quite parallel to the role of media in influencing and shaping voter behaviour (Schoeman & Puttergill, 2006:156). Although the conventional sanctioning device (i.e., elections) may appear to be weak, there is no doubt that

¹⁷ Also discussed in de Kadt and Lieberman (2017).

they do act as an accountability mechanism, and in the event where elections fail as an optimal mechanism to foster control over politicians, this is where alternative avenues of political accountability become crucial (Schulz-Herzenberg, 2009:22).

What makes South Africa an interesting case study to examine political accountability lies in the fact that electoral support for the ANC is still relatively unwavering despite poor public service delivery outcomes to its citizens (Booyesen, 2007:31). According to Bohler-Muller, Davids, Roberts, Kanyane, Struwig, *et al.* (2016:4) the way in which public service delivery dissatisfaction manifests itself varies, as it seems that the affluent generally utilise formal channels to express dissatisfaction, whereas the poor tend to protest to express their disappointment. Public service delivery issues tend to be increasingly blamed on government, whose targets, accompanied by increased citizen expectations overwhelm capacity and in turn have resulted in countless incidents of unrest occurring among South Africans (World Bank, 2011:3). Booyesen (2007:31) argues that the South African electorate are under the impression that “voting helps and protest works”. This belief forms the basis of the ‘dual-action repertoire’ used to describe South African politics as being the complex concurrence of the ballot¹⁸ and the brick¹⁹, which are viewed as complementary methods to achieve service delivery.

Protest in South Africa has been perceived as participation (Mottiar, 2013:608). As argued by political science scholars, the formal democratic system does not serve citizens in a manner that meets their expectations and for this reason, South African communities have incorporated protests in their accountability mechanisms (World Bank, 2011: 28). This should not come as a surprise as direct political action has been considered the norm rather than the exception in South Africa, verified by the fact that the current political settlement in the country was born out of protest (Bedasso & Obikili, 2015:1). It is worth noting that South Africa’s historical context is likely to have an influence on the electorate’s attitudes towards protest action (Bohler-Muller, Roberts, Struwig, Gordon, Radebe, *et al.*, 2017:82).

Numerous studies²⁰ identify 2004 as being the year in which South Africa started to experience a remarkable upsurge in local protests. This phenomenon was termed “service delivery protest

¹⁸ The ballot refers to elections.

¹⁹ The brick refers to protest.

²⁰ See Bohler-Muller *et al* (2017); Nleya (2011); Alexander (2010)

action” and it forever changed the South African political landscape. The main reason for this surge in protests is attributed to the realization that transformation with respect to the quality of life of South Africans was occurring extremely slowly, triggering feelings of disappointment and dissatisfaction (Steyn Kotze & Taylor, 2010:201). More specifically, most of the protests that occurred after 2004 stemmed from people’s grievances with municipal services and labour market opportunities, among others (Bohler-Muller *et al.*, 2017:82). With service delivery protests dominating local politics, the nature of many of these protests have turned violent, causing clashes between communities and the police (Lolwana, 2016:2). A series of protests, strikes, demonstrations and political violence can progressively become social unrest, which can either emerge as peaceful, disruptive, or violent. This in turn is ultimately regarded as an expression of collective dissatisfaction with the political system (Lancaster, 2018:29). Recent findings by Bohler-Muller *et al.* (2017:91) suggest that when compared to peaceful protest action, disruptive and even violent protest are becoming more acceptable to South Africans. It should be noted however, that even though violent and disruptive protest are considered a more effective means to attain desired results, mention is made of the fact that on average, these two types of protest are still predominantly viewed negatively by the South African public.

According to Steyn Kotze and Taylor (2010: 202), a trend worth observing is that protest action often tends to occur before an election. In addition, the authors mention that this trend might arise to exert political and social pressure on government or be the result of electoral competition within communities and even the result of party infighting. Ultimately, protest is undeniably a popular mechanism used to influence political outcomes. However, it is important to note that protest can also occur in alternative ways. Although political scientists are interested in the notion of ‘protest voting’, theoretical understanding around this topic is rather limited. One plausible explanation in the literature pertaining to non-voting is motivated by a call to boycott elections because of unsatisfactory public service delivery (Steyn Kotze, 2006:209). Non-voting can also occur because of a combination of non-competitiveness, indifference and in the event where alienation reduces the benefit of voting lower than its costs (Kselman & Niou, 2011:396). Should this occur, lower levels of voter turnout are to be expected. Low voter turnout is also attributed to several reasons ranging from failure by politicians to deliver on their electoral promises and insufficient electoral education, to long queues at polling stations (Mataka & Nkandu, 2020:82). Another plausible reason is voter apathy. Voter apathy involves more than just the indifference of voters towards participation in voting. Voter apathy also

arises from dissatisfaction with the political system, the lack of proper education and even ignorance (Agaigbe, 2015: 4).

Similar to the mechanism of non-voting, voicing dissatisfaction with the political system and withholding support as a means to punish corrupt leaders are some of the underlying motives for invalid voting (Martinez & Werner, 2018:6). Citizens can opt to refrain from choosing any political party and can cast invalid votes, which may refer to spoiled or blank ballots, exercising their right to vote or not to vote (Katz & Levin, 2018:489). With the number of spoiled votes becoming increasingly common in the developing world, its inclusion in this study is justified, as there is evidence²¹ to suggest that spoiled ballots are politically informative (Driscoll & Nelson, 2014:1). One theory as expressed by Aldashev and Mastrobuoni (2010:7) suggests that the rate of invalid ballots is related to protest. The authors describe this as the situation where a voter may have feelings about the choice they are faced with and may vote in accordance with these feelings once they arrive at the voting booth. In the event where voters are dissatisfied with the political system, they might want to cast an invalid ballot as an expression of protest. Similarly, they also highlight the possibility of voters willingly nullifying their ballots in the event that the anticipated margin of victory is adequately large for the opposition party, resulting in voters feeling that their electoral choice is gravely constrained. Based on the literature²², other reasons for increases in spoiled or invalid ballots are commonly attributed to ethnic separation, compulsory voting, and illiteracy.

4. Data

The data used in this paper are obtained from three sources and combined to create a panel dataset. The first are two Statistics South Africa (Stats SA) datasets: a 10% sample of the South African Census 2011 and the Community Survey 2016. The Census and Community Survey data provides important demographic information as well as information on various public services, which is of particular importance to this study. Generally, when reference is made to public service delivery it often includes water, sanitation, land, housing, electricity, and infrastructure. However, for the purpose of this research, based on the data available in the 2011 Census and the 2016 Community Survey, when reference is made to public service

²¹ See Power and Garand (2007) and Ugla (2008).

²² For example, see Sinclair and Alvarez (2004); De Paola and Scoppa (2012); Driscoll and Nelson (2014).

delivery or basic services it refers to only three services: household access to water, refuse collection and sewerage. The exclusion of electrification from the analysis is due to three reasons, as also discussed in de Kadt and Lieberman (2017:6). First, the expansion of electricity services in South Africa has been so extensive compared to the provision of water, refuse collection and sewerage which implies that there is less variation to explore. Second, the prevalence of electricity theft is quite common in South Africa, which makes it hard to determine whether households really have government-provided access to this service. Third, electricity provision is constrained by both stock and flow delivery. Even though the expansion of electrification has been so rapid, government has failed to increase capacity at the same rate. As a result, South Africans have been faced with continuing power outages, referred to as load shedding, since 2007 until present. This in turn might therefore confuse voters because they might now have access to electrification, but at the same time the actual flow of electricity can be described as erratic.

Table 2 below provides a brief explanation of how this study defines each of these key public service delivery variables²³.

²³ These services are for the most part defined as per de Kadt and Lieberman (2017).

Table 2: Key service delivery variables

Variable	Definition
Water	The proportion of households that have piped water inside the dwelling or piped water inside the yard only. ²⁴
Refuse collection	The proportion of households that have their refuse removed at least once a week. ²⁵
Sewerage	The proportion of households with access to a flush toilet connected to a public sewerage system or a flush toilet with a septic tank. ²⁶
Service delivery	A composite variable which represents the proportion of households with access to all three services, namely water, refuse collection and sewerage.

The second source of data is official voting data from both national and local elections. The voting data are publicly available on the South African Independent Electoral Commission (IEC) website.²⁷ Elections take place every five years in South Africa. National and provincial elections²⁸ happen simultaneously while municipal elections²⁹ take place two years later, also following a five-year cycle from its occurrence. In this paper, the period of focus is 2011 and

²⁴ ‘Piped water on community stand’ as a main source of water for drinking was excluded from the analysis given the fact that only the 2011 Census took the distance of the community stand from the dwelling into consideration.

²⁵ In the 2011 Census, sanitation is defined as the proportion of households that have their refuse removed by a local authority at least once a week. In the 2016 Community Survey, it is defined as the proportion of households that have their refuse removed by a local authority, private company, or community members at least once a week. For the purpose of this study, sanitation is defined in terms of regular and the hygienic disposal of refuse with the common denominator being the removal of refuse at least once a week.

²⁶ In the 2016 Community Survey, a question about the main type of toilet facility used and where this main type of toilet facility was located was asked (i.e., inside the dwelling/yard/outside the yard). In the 2011 Census, there was no question asked relating to the main toilet facility location. Thus, sewerage is only defined in terms of the main type of toilet facility used and not according to the location of the main toilet facility.

²⁷ The IEC website is: <http://www.elections.org.za>

²⁸ During national and provincial elections, citizens vote for a political party whose share of seats in Parliament is directly in proportion to the number of votes they obtain in an election. Whoever fills the seats won by the party is then decided by the party members and is referred to as a proportional representation (PR) system.

²⁹ For municipal elections, a hybrid or mixed system is used, which utilizes both the ward system as well as the proportional representation system.

2016³⁰ for local elections and 2014 and 2019³¹ for national elections. Analysis is done by municipality since the voting data, Census 2011 and Community Survey 2016 are best matched at municipal level. Four key variables are derived from the voting data: ANC vote share, incumbent vote share, voter turnout and spoiled ballots. These four variables provide some insight regarding voter behaviour. Table 3 below provides a brief explanation of how this study defines each of these key voting behaviour variables.

Table 3: Key voting variables

Variable	Definition
ANC vote share (National elections)	The proportion of total votes cast in favour for the ANC during national elections.
Incumbent vote share (Local elections)	The proportion of total votes cast in favour of the dominant party by municipality during local elections.
Voter turnout	The proportion of registered voters who voted by municipality.
Spoiled ballots	The number of ballots deemed invalid. ³²

Since the ANC has been South Africa’s governing political party since 1994, it seems plausible to consider the ANC as the dominant party incumbent during national elections. In the case of local elections, dominant party incumbents differ by municipality, as indicated by the election data.

The third source of data used here is protest data obtained from the Armed Conflict Location and Event Data Project (ACLED). ACLED³³ provides data on all reported political violence

³⁰ According to Lehohla (2016:1) municipalities are the most basic unit of government and are thus tasked with providing basic services in the regions they control. For this reason, it should be noted that the years during which the local elections, also known as the municipal elections, take place perfectly aligns with the Census and Community Survey data.

³¹ On the other hand, it should also be noted that the matching of the national election data with the Census and Community Survey has a three-year lag but given the rate at which changes in service delivery has occurred it still seems plausible and necessary to explore this avenue.

³² A ballot is considered spoiled if any of the following occurs: (1) the ballot is left blank (2) the ballot is vandalised (3) the ballot is physically damaged (4) random marks are made on the ballot other than the ‘voting’ mark (5) making more or less choices on the ballot than permitted (6) manually adding a political party or candidate to the voting list (7) incorrectly filling in the ballot making the voter’s decision unclear.

³³ The protest data are publicly available on the website of the Armed Conflict Location and Event Data Project, <http://acleddata.com>.

and protest events in South Africa.³⁴ This dataset is particularly useful to this research as it provides geographically coded protest and public violence data, and these incidents are categorised according to their motive. The period of interest for this protest data is for 2011 and 2016 to tie in with the local election, Census and Community Survey data. By inspection of the data, the motives behind protest action in South Africa are extremely vast and range from crime and labour market issues to education and environmental issues. For this reason, only protests related to public service delivery (water, refuse collection and sewerage) and politically motivated protests are included in the main analysis. The key variable derived from the protest data is the number of protests, which is measured by municipality, per year. Economic and demographic covariates are included from the 2011 Census and 2016 Community Survey.

It should be noted that the data discussed above are not without their limitations. First, since the geographical demarcation of certain municipalities changed over the years, it is not possible to have a perfect matching of all municipalities across the Census, Community Survey, voting and protest data. This implies that several municipalities³⁵ were either separated, integrated, or dissolved. The panel dataset constructed for this study is based on 2016 political geography as it incorporates the latest major geographical demarcation changes at the time of writing. In instances where certain municipal boundary re-determinations³⁶ had occurred, 2011 boundaries were reconciled with the 2016 boundaries by conducting a few ‘merging’ and ‘splitting’ exercises. Second, the non-availability of data on labour market activities, namely information

³⁴ ACLED data are not only limited to South Africa but also includes data for the rest of Africa, Southeast Asia, South Asia, Central Asia, the Middle East, the Caucasus, South-Eastern and Eastern Europe as well as the Balkans. ACLED is a disaggregated data collection, analysis and crisis mapping platform.

³⁵ The number of municipalities decreased from 234 in the 2011 Census to 213 in the 2016 Community Survey. Thus, there are eight metropolitan municipalities in South Africa which govern the largest metropolitan areas or the eight major cities, 44 district municipalities and 205 local municipalities.

³⁶ According to the Municipal Demarcation Board, there are three types of boundary re-determinations that exist. Type A - Technical and minor re-determinations: This refers to small scale boundary adjustment and/or alignment with a minor impact in the geographic area with little or in some cases no impact on the capacity of affected municipalities or on the number of voters. Type B – Consolidation and Annexations which refer to boundary re-determination that is considered to be medium in scale and may have an impact on a substantial geographic area with a number of voters in one or all municipalities affected. Type C – Amalgamation and Categorisation refers to major and municipal boundary re-determinations considered to be large scale as it has huge impact on the geographic areas, number of voters and the capacity of the affected municipalities.

pertaining to income and employment from the 2016 Community Survey, even though it was captured, is considered a serious drawback. Despite that these variables have not been omitted from the analysis; they are only included as baseline variables. As stated by de Kadt and Lieberman (2017:9) some services, particularly those accessible from inside the home,³⁷ are privately provided, which implies that not all changes in service provision are the result of direct government action. A data limitation therefore exists as there is no way to discern the share of government action present in the provision of these services.

5. Methodology

The empirical modelling in this paper seeks to investigate the routes of political accountability in a relationship between public service delivery, voting behaviour and protest action in South Africa. This is done by testing whether a breakdown in voting as a political accountability mechanism exists, due to citizens rather opting to utilize alternative routes to political accountability. As previously mentioned, literature around democratic governance suggests that theoretically, when good public service delivery is provided, citizens will continue to vote for the incumbent. Therefore, it is expected that the inverse would occur should public service delivery of a poor quality be provided. This theory is therefore seated in the concept of political accountability.

The aim of this research is to determine whether political accountability in South Africa indeed works as theory postulates. To do this, the main analysis proceeds in two parts. First, whether citizens use their vote to hold government accountable is explicitly examined. A new and surprising answer to this question was first presented in the findings of de Kadt and Lieberman (2017) who discovered that improvements in key public service delivery areas, those with direct implications for public health (water provision, sewerage and refuse collection), lead to decreases in support for dominant party incumbents. For this reason, the first hypothesis of this paper tests whether improvements in public service delivery leads to increased electoral returns to the incumbent. More specifically, the intention is to test whether the earlier findings by de Kadt and Lieberman (2017) remain valid. In analysing the relationship between public service

³⁷ The installation of a flush toilet is an example.

delivery and voting, the negative relationship they reported implies a breakdown in the conventional political participation route of voting, to enforce political accountability.

The second part of this study questions whether citizens use protest action to hold government accountable. The second hypothesis tests if the electorate sanctions government for poor performance by increasing the frequency of protests, and rewards government for good performance by decreasing the frequency of protest action. Performance in the context of the second hypothesis relates to improvements in public service delivery. This is done to determine whether South Africans prefer to access alternative forms of political participation (i.e., protest action) as a more effective route to accountability compared to voting in elections.

Testing if voting may be distorted due to the probable view that protest action seems to be a more effective accountability mechanism, stems from Booyesen's (2007) "dual-action repertoire" interpretation of political behaviour in South Africa. As previously mentioned, this relates to the notion that South Africans view voting and protest action as being complementary forms of political participation in their attempt to improve their chances of public service delivery. Following the nature of protest action in South Africa, it seems plausible to posit a negative relationship between public service delivery and protest action. More specifically, one would expect that improvements in public service delivery are more likely to bring about a decrease in protest action, while deterioration in public service delivery is more likely to bring about an increase in protest action. The main analysis is further deconstructed into two stages described below.

5.1 Testing hypothesis 1: Do increases in public service delivery lead to increased electoral returns to the incumbent?

The first hypothesis aims to estimate the average association between the change in public service delivery (explanatory variable, for the various services) and the change in incumbent vote share (dependent variable). The analysis is conducted using a two-wave balanced panel where t_1 is 2011 and t_2 is 2016. The three public service delivery variables of interest are access to water, refuse collection and sewerage. Given the time period of the data, two outcome variables are tested under the first hypothesis. The dependent variable thus differs depending on whether the analysis scrutinizes the period during the local elections or national elections.³⁸

³⁸ Local elections (2011 and 2016) and national elections (2014 and 2019).

For national elections, the dependent variable is defined as ‘ANC vote share’³⁹ while the dependent variable for local elections varies between both ‘ANC vote share’ and ‘incumbent vote share’.⁴⁰

The analysis roughly follows the approach followed by de Kadt and Lieberman (2017). However, as already indicated, given the non-availability of information on income and employment status in the 2016 Community Survey, the current analysis does not include the estimation of a first-difference regression, as per de Kadt and Lieberman (2017). Instead, fractional probit regressions are estimated using the Mundlak approach (Mundlak, 1978).

Fractional response regressions in essence are well suited to outcomes such as proportions, rates, or fractional data. The only assumption required by fractional regression models is that of a functional form for y that imposes the desired constraints on the conditional mean of the dependent variable as follows:

$$E(y|x) = G(x\theta) \quad (1)$$

where $G(\cdot)$ represents some nonlinear function satisfying the condition $0 \leq G(\cdot) \leq 1$. In other words, to use a fractional regression, the following condition must be met: $0 \leq y \leq 1$ (i.e., the dependent variable is either greater than or equal to 0 and less than or equal to 1). For the analysis, a fractional probit regression is employed. A probit functional form is considered widely used and given by:

$$G(x\theta) = \Phi(x\theta) \quad (2)$$

The use of fractional probit regression for the analysis is therefore considered a more suitable approach given the fact that the dependent variable (vote share) is a proportion. The use of this model thus ensures that the predicted values lie in the unit interval. Moreover, since the aim is to examine change over two periods, the fractional probits are estimated with the incorporation of the Mundlak approach which is applied in lieu of the first-difference regressions. Hence, in the context of this paper, the first hypothesis is tested using Mundlak fractional probits. This approach involves estimating the panel-level average of time-varying covariates, which are then included as regressors in the model. A fractional probit model is consequently estimated

³⁹ The ANC has always been the dominant party incumbent during national elections since the birth of South Africa’s democracy.

⁴⁰ The ANC has not always been the dominant party incumbent in all municipalities for local elections.

and combined with additional regressors as required by the Mundlak approach. This combination allows for the distribution of the outcome variable to be taken into consideration while also controlling for unobserved time invariant factors that may bias the results.

5.2 Testing hypothesis 2: Do increases in public service delivery lead to a decrease in protest action?

The second hypothesis aims to estimate the average association between the change in public service delivery (explanatory variable, for the various services) and the change in protest action (dependent variable). As with the first hypothesis, the three public service delivery variables of interest remain water, refuse collection and sewerage. The dependent variable represents the number of protests. Using the two-wave balanced panel as used in the first hypothesis, where t_1 is 2011 and t_2 is 2016, the second hypothesis is then tested to examine political accountability via protest action. The dependent variable, ‘number of protests’ is a count variable. For this reason, a count data model is used. Regarding the nature of the protest data employed, the incidence of zero counts is greater than that of non-zero counts⁴¹, combined with a variance larger than the mean. A standard Poisson model would therefore not be appropriate in this instance as it is not able to distinguish between the two processes, causing an excess number of zeros. A zero-inflated Poisson model is therefore deemed more suitable as it allows for and accommodates this complication (Yusuf, Bello & Gureje, 2017:69).

In this analysis, as earlier mentioned, number of protests is a count variable with zero responses. Thus, if no protests occurred, the only possible outcome would be zero. On the other hand, if a protest did occur, it is considered a count process. Following Loeys, Moerkerke, De Smet and Buysse (2012) in a Zero-Inflated Poisson (ZIP) regression, the counts Y_i equal 0 with probability p_i and follow a Poisson distribution with mean μ_i with probability $(1 - p_i)$. The ZIP model can be viewed as a combination of two component distributions. It can be derived that:

$$Pr(Y_i = 0) = p_i + (1 - p_i) \exp(-\mu_i) \quad (3)$$

$$Pr(Y_i = k) = (1 - p_i) \exp(-\mu_i) \frac{\mu_i^k}{k!}, \quad k = 1, 2, \dots \quad (4)$$

⁴¹ Poisson regressions provide a standard framework in the analysis of count data. In reality however, it is often found that count data has a higher incidence of zero counts than is expected for the Poisson distribution.

As earlier mentioned, following equation (3) it is important to recognize that zero observations can occur from both the zero-component distribution and the Poisson distribution. The ‘expected’ zeros are observed under the Poisson distribution while the ‘excess’ zeros related to the zero-component distribution. To evaluate the effect of covariates on the count distribution in a ZIP model, p_i as well as i can be expressed as a function of covariates. It should be noted that the most natural way to model the probability of excess zeros is via a logistic regression model as:

$$\text{logit}(p_i) = x_i^T \beta \quad (5)$$

From equation (5) above, x_i is the vector of covariates and β a vector of parameters. On the other hand, through a Poisson regression, the impact of covariates on count data can be modelled. This however excludes the excess zeros. This can be estimated as:

$$\log(\mu_i) = x_i^T \gamma \quad (6)$$

Estimates for both β and γ in relation to zero inflated models can be obtained through maximum likelihood estimation. Furthermore, since the purpose of this second hypothesis is to estimate the average association between the change in public service delivery and the change in the number of protests, the Mundlak approach is once again incorporated into the analysis for reasons previously mentioned. This time around, a ZIP model is estimated and combined with additional regressors as required by the Mundlak approach.

5.3 Additional routes to political accountability

As part of the subsidiary analysis, two additional routes to political accountability are introduced. This is to expand on the investigation related to the notion that voting may perhaps be distorted, due to citizens preferring to opt into the engagement in alternative accountability routes. These routes to accountability are voter turnout and spoiled ballots. For the purposes of analysis, non-voting can either refer to voter apathy or election boycott, which in turn manifests into low voter turnout. Invalid voting on the other hand is captured by spoiled ballots. Given that voter turnout is a proportion, the same econometric approach is applied as with the first hypothesis. Using a two-wave balanced panel where t_1 is 2011 and t_2 is 2016, the average association between the change in public service delivery (explanatory variable) and the change in voter turnout (dependent variable) is estimated for local elections, once again with the incorporation of the Mundlak approach.

Regarding spoiled ballots, the average association between the change in public service delivery (explanatory variable) and the change in spoiled ballots (dependent variable) is estimated for local elections, using the incorporation of the Mundlak approach. Spoiled ballots in this instance represents a count variable with over-dispersed⁴² count data and for this reason, a negative binomial regression is estimated. A negative binomial regression is applied using maximum likelihood estimation. The basic negative binomial regression model for an observation i is written as:

$$Pr(Y = y_i | \mu_i, \alpha) = \frac{\Gamma(y_i + \alpha^{-1})}{\Gamma(\alpha^{-1})\Gamma(y_i + 1)} \left(\frac{1}{1 + \alpha\mu_i} \right) \alpha^{-1} \left(\frac{\alpha\mu_i}{1 + \alpha\mu_i} \right)^{y_i} \quad (7)$$

6. Empirical analysis

6.1 Descriptive statistics

Table 4 shows the mean percentage change in access to each of the basic services between 2011 and 2016. From the table it is evident that mean change in access to sewerage (i.e., flush toilets) is the largest, followed by refuse collection. The mean change in access to water is found to be negative.⁴³

Table 4: Mean percentage change in access to basic services, 2011-2016

	Mean	Min	Max
Water_ch5	-0.0072	-0.4843	0.2734
Refuse_ch5	0.0052	-0.2550	0.7112
Sewerage_ch5	0.0269	-0.1486	0.2530

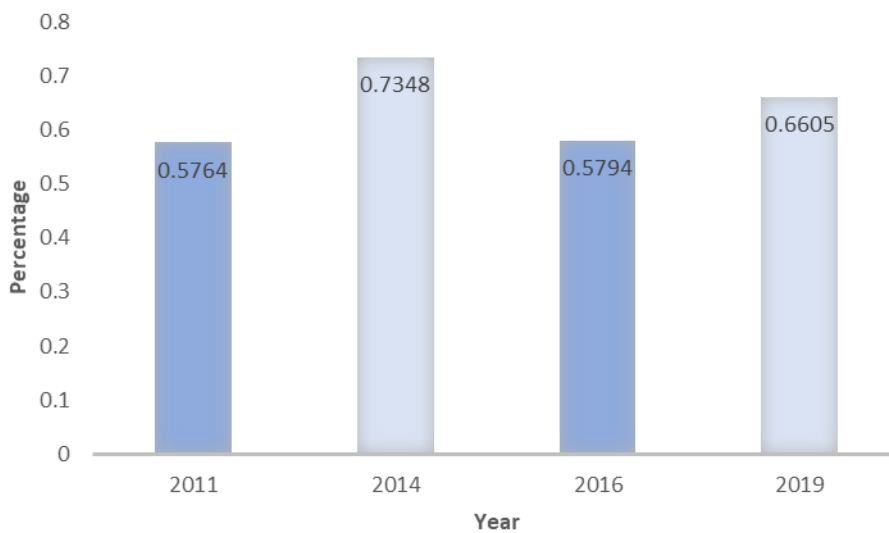
Source: Own calculations using the Census 2001 and CS 2016 data.

⁴² Over-dispersion in this case implies that the conditional variance exceeds the conditional mean.

⁴³ The most probable explanation for this, is the drought experienced in South Africa, particularly between 2014-2016, which lead to periods in which the water supply was turned off by municipalities in certain areas and at certain times. It is also important to note that the Census and Community Survey questions about access to services are measured in self-reported manner. Thus, since access is self-reported, this decline in access does not refer to a decline in the number of households with access to the infrastructure providing water, but rather to the availability of water.

Concerning voting behaviour, voter turnout is presented in Figure 1 below. Voter turnout between 2011 and 2016 for local elections increased by 0.3 percent. For national elections, voter turnout declined between 2014 and 2019 by 7.43 percent. From the graph it is also evident that generally, voter turnout is greater for national elections compared to local elections.

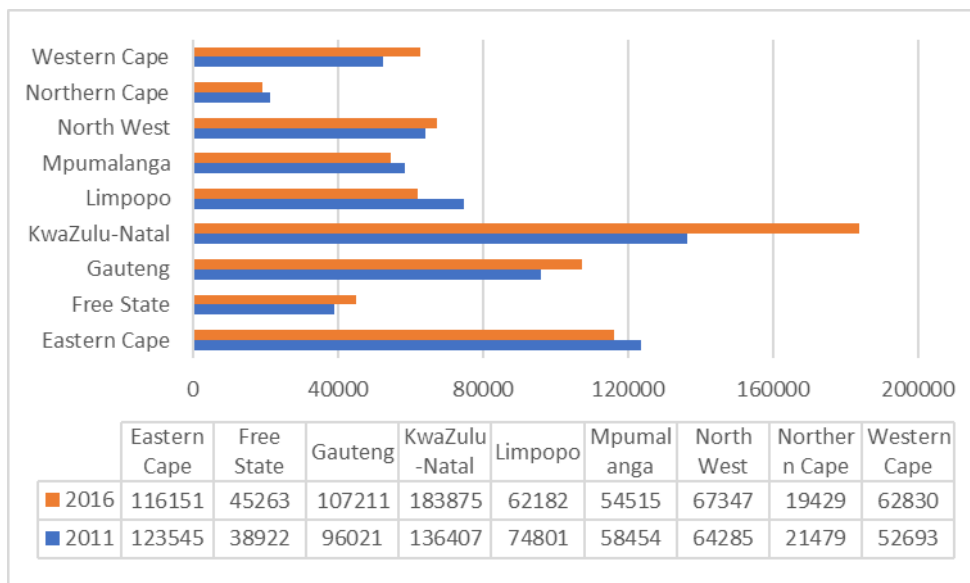
Figure 1: Voter turnout (%) for national and local elections, 2011 - 2019



Source: Own calculations using IEC data.

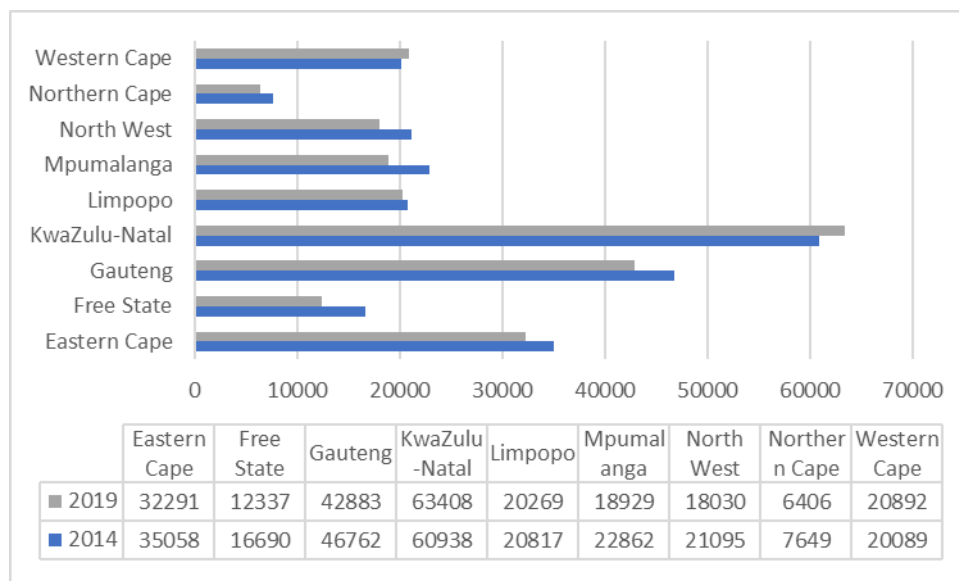
Figure 2 and 3 show the number of spoiled ballots during local elections and national elections by province, respectively. Even though the number of valid votes greatly exceeds the number of spoiled votes, the figures below suggest that the number of spoiled votes by province is actually quite large. By comparing the numbers between local and national elections, it appears that from an overall perspective, the number of spoiled ballots during local elections generally tends to be higher compared to the total during national elections. Based on the figures, it seems that KwaZulu-Natal accounts for the highest number of spoiled ballots irrespective of whether local or national elections take place. In contrast, the Northern Cape produces the smallest number of spoiled ballots for both local and national elections.

Figure 2: Number of spoiled ballots during local elections, by province



Source: Own calculations using IEC data.

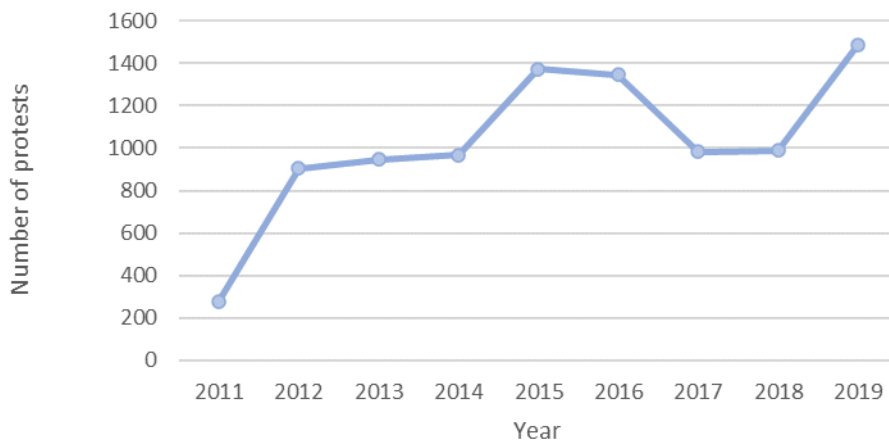
Figure 3: Number of spoiled ballots during national elections, by province



Source: Own calculations using IEC data.

Figure 4 shows the number of protests in South Africa from 2011 to 2019. From the graph it is evident that overall, there has been an upward trend in the occurrence of protest action over the eight-year period. The motive for protest action in the graph below ranges from public service delivery and education to labour market and environmental issues.

Figure 4: Number of protests in South Africa, 2011 - 2019



Source: Own calculations using ACLED data.

Figures 5-14 in the Appendix, provide a visual representation of the relationship between access to services, voter behaviour and protest action, and at the same time allows one to compare the situation in 2011 against 2016. Overall, from the maps it is apparent that there has been a substantial increase in the number of protests over the five-year period indicated by both the yellow and red dots.⁴⁴ Figures 5 and 6 map access to piped water and protest locations during 2011 and 2016, respectively. The areas shaded white represent municipalities with the lowest proportion of access (0 percent to 20 percent) while the areas shaded dark blue represent municipalities with the highest proportion of access (81 percent to 100 percent). Similarly, Figures 7 and 8 map protest locations for 2011 and 2016 but this time in relation to refuse collection. Once again, areas shaded white represent municipalities with the lowest proportion of access (0 percent to 20 percent) whereas the highest proportion of access (80 percent and over) is the darkest shade of green. The proportion of access to sewerage (flush toilets) mapped against protest action locations is represented in Figures 9 and 10. From the map it is evident that there has been a considerable improvement in access to flush toilets over the period, as indicated by the black shading, although it should be noted that the number of municipalities with access in the lower range (0 percent to 20 percent) is still appalling.

Since voting is considered a route to enforce political accountability, voter behaviour is described by means of voter turnout and by examining how citizens voted (i.e., comparing dominant political parties between municipalities). Voter turnout during the 2011 local

⁴⁴ Only politically motivated protests and protests related to service delivery are mapped.

elections is presented in Figure 11, while Figure 12 presents voter turnout during the 2016 local elections, both mapped against protest action locations. Although most protest action took place in and around the main cities, the number of protests in municipalities in the Eastern Cape and KwaZulu-Natal increased dramatically over the period with voter turnout varying between these municipalities as well. Lastly, the 2016 municipal elections were characterised by the ANC's dominance being greatly diminished. The maps in Figure 13 and Figure 14 feature four political parties between 2011 and 2016 who remained contenders for dominance: the ANC, DA, Inkatha Freedom Party (IFP) and Independent Civic Organisation of South Africa (ICOSA). From the maps it is also apparent that in 2016 the number of protests was largely concentrated in municipalities where the ANC was the dominant party.

6.2 Results: Testing hypothesis 1

The purpose of the first hypothesis is to test whether political accountability works as theorised; that is, do citizens use their vote to hold government accountable as commonly assumed. Should voting behaviour work as theorised, the dominant party incumbent should be rewarded with an increase in vote share, given improvements in public service delivery. As per de Kadt and Lieberman (2017), the accountability hypothesis is tested in its purest form: whether increases in public service delivery led to an increase in electoral returns to the incumbent. Two separate outcome variables are specified: 'ANC vote share' and 'incumbent vote share, both representing the conventional approach to enforce political accountability.

As a starting point, in accordance with de Kadt and Lieberman (2017), Table 5 presents the estimated changes in ANC vote share in national elections, given improvements in public service delivery. Similarly, Table 6 shows the effect of changes in public service delivery on change in ANC vote share, but this time at local level. Lastly, Table 7 presents the effect of changes in public service delivery on the incumbent vote share. By roughly replicating the de Kadt and Lieberman approach⁴⁵, regression [1] – [3] presents each public service delivery variable⁴⁶ being correlated with the outcome variable, controlling for various economic, demographic, and political characteristics.⁴⁷ An alternative specification, regression [4], is

⁴⁵ As per de Kadt and Lieberman (2017), the authors split their data into two samples. This approach was attempted but did not change the results and is therefore not reported here.

⁴⁶ As defined in Table 2.

⁴⁷ More variable descriptions which have not previously been mentioned can be found in Table 11 in the Appendix.

included in the analysis, in which all three public service delivery variables are controlled for, once again with various economic, demographic, and political characteristics. Based on the hypothesis, the association between changes in public service delivery and changes in vote share are considered the main coefficient of interest.

Generally, the results presented depict the opposite of what one would expect. Table 5 shows that only greater improvements in sewerage provision typically predict a decline in ANC vote share at national level. This finding seems to be consistent for both the individual and alternate specification. Water provision and refuse collection however seem to have no significant effect on ANC vote share, although negative coefficients are observed, contrary to what theory assumes. On the local elections front, in Table 6, sewerage provision once again appears to be a significant predictor, indicating a decline in ANC vote share given improvements in sewerage provision. In the alternative specification however, both water and sewerage are correlated with ANC vote share, with the water coefficient being positive. Similarly, Table 7 seems to echo the results with both water and sewerage, typically predicting an increase and decline in incumbent vote share respectively, at local level. These results seem to be robust, as seen in the alternative specification.

The results in Tables 5 to 7 seem to subtly capture the complexity of South Africa's democracy. The findings appear to suggest a deviation between what theory postulates versus reality, with regard to elections as a reward or sanctioning device, which in turn acts as a political accountability mechanism. The results seem to suggest that the theoretical premise surrounding political accountability is not as straightforward as commonly assumed. It is thus reasonable to assume that the results paint a realistic picture of actual applicability of elections as an accountability mechanism in South Africa.

Considering each public service delivery variable separately, sewerage and water feature most prominently. The sewerage coefficient appears to be very robust, no matter the specification or election type, as it is always negative and significant. This result seems interesting given the fact that the change in mean access to sewerage (flush toilets) was the highest when compared to water and refuse collection, as presented earlier in the descriptive statistics. To explore this negative relationship between sewerage provision and vote share in more detail, it is imperative to consider the highly politicised 2011 'Toilet Wars' as a plausible driver of these results. This refers to public outcry owing to the humiliation endured by citizens who were expected to use

outdoor unenclosed flush toilets that were being erected in informal settlements.⁴⁸ This scandal sparked numerous protests in the run-up to the 2011 local elections, which was accordingly dubbed the ‘2011 Toilet Elections’. Ironically, this implied that even though access to flush toilets had technically been increasing, the toilets being erected were deemed substandard and undignified. The scandal undeniably caused an upsurge of negative publicity nationwide, which ultimately encouraged citizens to be more mindful before casting their vote in the 2011 local election (Tempelhoff, 2012:82). Furthermore, what may be surprising to some is the robust negative sewerage coefficient that persistently comes through irrespective of whether change in ‘ANC vote share’ or ‘incumbent vote share’ is estimated. A possible explanation for this could be related to both the ANC and DA⁴⁹ who were politically compromised at the time due to unenclosed porcelain flush toilets being erected in the provinces they controlled (Robins, 2014: 480).

When considering the mean change in access to sewerage over the five-year period, although the proportion of households with access to flush toilets had increased, it is also important to consider that, not only did the population increase but so did the use of ‘other’ toilet facilities⁵⁰, deemed inappropriate to many South Africans. From the data it is therefore evident that household access to ‘decent’⁵¹ toilets have increased but at the same time, a relatively large proportion of the South African electorate still only have access to suboptimal toilet facilities, perhaps another justification for the inverse relationship between vote share and sewerage provision.

In contrast, surprising new evidence of a positive association between improvements in public service delivery, specifically water provision and incumbent vote share have come to light. The nature of these results seems to indicate that the water coefficient is a rather unique public service delivery variable. Water in particular, can be viewed as an antecedent to the provision of other basic services. Within the five-year period under study, it is important to consider the

⁴⁸ See Tempelhoff (2012)

⁴⁹ The DA is the political party in control of the Western Cape Province.

⁵⁰ Other toilet facilities refer to toilets not connected to sewerage or a septic tank. Based on the 2011 Census and 2016 CS, this refers to: a bucket toilet, chemical toilet, a pit toilet without ventilation, a pit toilet with ventilation (VIP), an ecological toilet or worst-case scenario, no toilet.

⁵¹ In the context of this dissertation, decent toilets refer to flush toilets connected to sewerage or a septic tank.

drought of 2014-2016 as a driver of these results (Swemmer, 2020:31). Jankielsohn (2012:125) stresses that in South Africa, water is central to politics at local level. It is therefore reasonable to assume that citizens would understand the significance of water during a drought to a greater extent (compared to if there was no drought), and simultaneously be more aware of the way in which government handles such a crisis.

According to Jankielsohn (2012:132) what is interesting is that problems in water provision are not mainly due to the backlogs of providing water to South Africans who were previously without access. The issues are rather related to costs associated with replacing neglected infrastructure, and the provision of new infrastructure to new households because of population growth. Water infrastructure really became a priority in South Africa during 2016, given the extent of the drought and its effect on sectors such as agriculture and trade.⁵² Given the measures implemented by government (such as water restrictions and an increased budget allocation towards the water infrastructure agenda versus systematic failures in budgeting and governance), along with no known reports of human life lost as a result of the drought, it may be plausible to consider all these factors as having an influence on citizens, before casting their vote in the 2016 local elections.

With water provision being the exception, there is almost no evidence of a positive relationship between improvements in public service delivery and vote share. For this reason, three main conclusions are drawn. First, overall, the results persistently indicate either a null or a negative relationship between improvements in service provision and ANC vote share. These results thus seem to favour the rejection of the commonly assumed hypothesis that increases in service provision led to increased incumbent vote share. As per de Kadt and Lieberman (2017), when only considering the ANC as the dominant party incumbent, the findings of this study appear to confirm the findings of the authors in the sense that improved service provision is not associated with an increase in dominant party incumbent vote share. This in turn suggests that democracy does not particularly work as imagined. Second, an interesting find emerges when revising the analysis to incorporate the fact that realistically dominant party incumbents differ by municipality⁵³ in the event of local elections. Strikingly, an increase in incumbent electoral performance occurs given greater improvements in water provision. Lastly, another driver of

⁵² See <https://infrastructurenews.co.za/2016/05/27/water-infrastructure-unlocking-sas-economy/>

⁵³ There are certain municipalities who are not ANC controlled.

these results could be explained by relative deprivation. As per de Kadt and Lieberman (2017), it may be that the results presented pertaining to voting behaviour reflect increased dissatisfaction among citizens without services, who reside close to areas where citizens usually enjoy greater levels of service provision. They in turn compare their overall satisfaction based on what others around them are receiving and vote accordingly.

Table 5: Mundlak Fractional Probit Regression – Effect of change in service delivery on the change in ANC vote share for national elections

Change in ANC vote share (national elections)				
	[1]	[2]	[3]	[4]
water	-0.144 (0.343)			0.195 (0.387)
refuse_col		-0.0283 (0.210)		0.270 (0.226)
sewerage			-0.707** (0.319)	-0.934*** (0.349)
white	1.779* (0.936)	1.757* (0.954)	1.701* (0.944)	1.569* (0.936)
log_pop	-0.00700 (0.0486)	-0.00546 (0.0499)	-0.00222 (0.0483)	-0.00709 (0.0487)
female	-1.366* (0.750)	-1.346* (0.697)	-1.581** (0.670)	-1.334* (0.758)
traditionalfrac	0.126** (0.0581)	0.124** (0.0584)	0.129** (0.0590)	0.136** (0.0579)
housetype	-0.552 (0.522)	-0.560 (0.536)	-0.296 (0.554)	-0.381 (0.568)
opp_control	-0.589*** (0.0355)	-0.597*** (0.0349)	-0.602*** (0.0362)	-0.598*** (0.0364)
employed	0.563* (0.291)	0.445 (0.277)	0.477* (0.277)	0.586** (0.291)
log_income	-0.652*** (0.0931)	-0.661*** (0.0995)	-0.642*** (0.0957)	-0.640*** (0.0985)
Constant	6.008*** (0.835)	6.003*** (0.861)	5.763*** (0.847)	5.783*** (0.871)
N	425	425	425	425

Notes: Results above are from Fractional Probit Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016 and IEC data.

Table 6: Mundlak Fractional Probit Regression – Effect of change in service delivery on the change in ANC vote share for local elections

Change in ANC vote share (local elections)				
	[1]	[2]	[3]	[4]
water	0.494 (0.425)			0.976** (0.466)
refuse_col		-0.173 (0.241)		0.318 (0.256)
sewerage			-0.861** (0.345)	-1.354*** (0.391)
white	3.504*** (1.218)	3.711*** (1.219)	3.631*** (1.229)	3.219*** (1.246)
log_pop	0.0334 (0.121)	0.0361 (0.122)	0.0365 (0.122)	0.0349 (0.122)
female	-0.630 (0.893)	-1.100 (0.828)	-1.308 (0.806)	-0.639 (0.879)
traditionalfrac	0.0974 (0.0730)	0.0927 (0.0736)	0.100 (0.0740)	0.110 (0.0724)
housetype	-0.589 (0.545)	-0.378 (0.562)	-0.114 (0.577)	-0.311 (0.587)
opp_control	-0.607*** (0.0424)	-0.616*** (0.0417)	-0.615*** (0.0444)	-0.611*** (0.0449)
employed	0.460 (0.352)	0.383 (0.345)	0.434 (0.341)	0.518 (0.347)
log_income	-0.852*** (0.130)	-0.849*** (0.134)	-0.830*** (0.132)	-0.838*** (0.135)
Constant	8.127*** (1.250)	7.991*** (1.255)	7.790*** (1.276)	7.915*** (1.302)
N	425	425	425	425

Notes: Results above are from Fractional Probit Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016 and IEC data.

Table 7: Mundlak Fractional Probit Regression – Effect of change in service delivery on the change in incumbent vote share for local elections

Change in incumbent vote share (local elections)				
	[1]	[2]	[3]	[4]
water	0.658* (0.397)			1.100** (0.441)
refuse_col		-0.0471 (0.230)		0.413 (0.254)
sewerage			-0.630** (0.298)	-1.209*** (0.361)
white	2.362** (1.142)	2.593** (1.158)	2.534** (1.160)	2.073* (1.145)
log_pop	0.0832** (0.0378)	0.0822** (0.0386)	0.0847** (0.0388)	0.0818** (0.0394)
female	0.245 (0.845)	-0.249 (0.787)	-0.443 (0.765)	0.332 (0.832)
traditionalfrac	0.116** (0.0558)	0.114** (0.0563)	0.118** (0.0563)	0.130** (0.0552)
housetype	-0.561 (0.463)	-0.358 (0.468)	-0.133 (0.488)	-0.370 (0.498)
opp_control	-0.295*** (0.0338)	-0.303*** (0.0339)	-0.312*** (0.0352)	-0.309*** (0.0352)
employed	0.166 (0.277)	0.112 (0.272)	0.119 (0.271)	0.185 (0.274)
log_income	-0.557*** (0.0785)	-0.555*** (0.0815)	-0.536*** (0.0781)	-0.540*** (0.0812)
Constant	5.146*** (0.724)	5.026*** (0.730)	4.733*** (0.718)	4.828*** (0.746)
N	425	425	425	425

Notes: Results above are from Fractional Probit Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016 and IEC data.

6.3 Results: Testing hypothesis 2

The results from the first hypothesis seem to broadly confirm the findings by de Kadt and Lieberman (2017), which provides evidence of a breakdown in the relationship between public service delivery and voting behaviour in South Africa. Since the findings seem to go against what theory traditionally assumes, is all the more reason to delve into possible explanations as to why this might occur. On this basis, the second hypothesis is introduced to examine whether the breakdown in this relationship is because South Africans are accessing alternative forms of political participation as a more effective route to accountability, rather than voting in elections.

The intention with the second hypothesis is to examine whether citizens use protest action as an accountability mechanism to attain public service delivery. Its purpose is to provide some insight regarding the inclination of using a non-electoral mechanism as an instrument to

achieve what should in essence be attainable through engagement in the electoral process. Logically, one would describe the relationship between public service delivery and protest action as inverse. This is attributed to the fact that public service delivery protests in South Africa are usually associated with poor public service delivery outcomes.

Table 8 shows four Mundlak Zero-Inflated Poisson regression models of the impact of improvements in public service delivery on the number of protests. Regression [1] – [3] shows the effect of each specific public service delivery variable on the number of protests. Regression [4] shows the effect of a composite variable, labelled service delivery, which indicates access to all three services (water, refuse collection and sewerage) on the number of protests. Once again, various economic, demographic, and political variables are controlled for.

From the protest model⁵⁴ improvements in the single public service delivery variables, refuse collection and sewerage, appear to be significant predictors of the number of protests that occur. What is interesting is that although water provision by itself is insignificant in regression [1], when considering the composite variable, it seems that improvement in public service delivery in general is a significant predictor of the number of protests. The inflated model⁵⁵ specifies the predictors for the logit equation, which is included to predict excess zeros⁵⁶ as previously explained. A requirement of the inflated model is to control for variables that may have the same probability of belonging to the ‘zero class’ (Rodríguez, 2013:5). In other words, a variable that is correlated with having zero protests. One variable that can be considered is the traditional land variable⁵⁷ that when tested, appears to be statistically significant.

⁵⁴ Since the ZIP model generates two separate models and then combines them, the protest or count portion of the model is a Poisson model.

⁵⁵ The inflated model is a logit model.

⁵⁶ Based on theory and the nature of count data, it is suggested that the excess zeros are generated by a separate process from the count values and for this reason, the excess zeros are modelled independently.

⁵⁷ Traditional land is used to model excess zeros because it is in these areas where government accountability works differently. It is usually in these areas where intermediaries (i.e., in municipalities where there are chiefs and traditional ownership for example) are leaders. This in turn implies that protesting would likely be less effective and thus, the possibility of having zero protest is much higher than in other municipalities.

What is interesting is that overall, the results from Table 8 seem to provide evidence that accountability through protest behaviour works in the direction that theory predicts. This shows that increases in public service delivery are more likely to bring about fewer protests. This would suggest an alternative route to political accountability.

Table 8: Mundlak Zero-Inflated Poisson Regression - Change in service delivery on the number of protests in South Africa, 2011 – 2016

Change in number of protests (2011 - 2016)				
	[1]	[2]	[3]	[4]
water	-5.349 (4.307)			
refuse_col		-5.460* (2.929)		
sewerage			-5.574* (3.365)	
service delivery				-7.687*** (2.932)
white	10.56 (9.943)	-4.242 (10.60)	3.126 (10.68)	3.032 (10.69)
female	13.51* (7.741)	5.070 (7.950)	10.99 (7.529)	7.356 (7.808)
age	-0.227** (0.111)	-0.248** (0.111)	-0.223** (0.104)	-0.227** (0.105)
log_pop	-0.890*** (0.230)	-0.521** (0.222)	-0.755*** (0.234)	-0.659*** (0.231)
employed	-6.996** (2.994)	-7.973*** (2.997)	-6.650** (2.872)	-6.450** (2.859)
log_income	3.949*** (0.591)	3.260*** (0.575)	3.524*** (0.566)	3.413*** (0.590)
hh_size	-0.423 (0.316)	-0.246 (0.283)	-0.433 (0.309)	-0.380 (0.290)
Constant	-36.62*** (6.031)	-31.14*** (5.880)	-33.41*** (5.827)	-35.71*** (4.994)
Inflate				
traditionalfrac	1.574** (0.694)	1.812** (0.725)	1.689** (0.751)	1.689** (0.734)
_cons	0.208 (0.362)	0.421 (0.336)	0.462 (0.344)	0.421 (0.345)
N	426	426	426	426

Notes: Results above are from Mundlak Zero-Inflated Poisson Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above, as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016, IEC and ACLED data.

6.4 Results: Additional routes to political accountability

This section explores voter turnout and spoiled ballots as alternative routes to political accountability, supplementary to protest action. These two alternatives are framed as possible channels of silent protest. As earlier mentioned, silent protest in the context of this paper, refers to voter turnout as way of capturing non-voting, and spoiled ballots as a way of capturing invalid voting. By framing voter turnout as a probable means of silent protest, one would expect that voters who are eligible to vote, would rather choose to not vote should they deem public service delivery unsatisfactory. This leads us to expect improvements in service delivery to bring about an increase in voter turnout.

Table 9 shows the estimated changes in voter turnout in local elections, given improvements in public service delivery. Once again, these results seem to capture the complexity of voting behaviour in South Africa. What is surprising is that the results presented in Table 9 are more suggestive of a negative relationship between public service delivery and voting behaviour. Sewerage and the composite service delivery coefficient in particular are both negative, statistically significant, and quite large. This in turn suggests a breakdown in voter turnout as an alternative route to political accountability. Instead, it is also plausible to consider the possibility that voters may be more apathetic given improvements in public service delivery. This may imply that voters are more willing to vote for example, when the rate and quality of public service delivery is considered poor.

Findings by Ntjanyana (2016:58) may provide plausible explanations as to why the results tell a story that is contrary to general expectations. Firstly, these findings could relate to the belief of some that citizens do not vote on the basis of service delivery but rather vote for other purely political reasons. Secondly, there is evidence to suggest a time where people did believe that public service delivery in municipalities motivated people to vote, to ensure that they would receive more services in future. This view soon changed when voters realised that after elections, municipalities seemed to ‘forget’ about them. Other probable reasons driving this breakdown between improvements in public service delivery and voter turnout may be attributed to voters being under the impression that no remarkable changes have occurred in the quality of their lives after voting for the ANC since 1994; the belief that their vote will not make a difference and the existence of corruption and nepotism among public servants (Ntjanyana 2016:58).

Table 9: Mundlak Fractional Probit Regression - Change in service delivery on change in voter turnout for local elections

Change in voter turnout (local elections)				
	[1]	[2]	[3]	[4]
water	-0.218 (0.150)			
refuse_col		-0.156 (0.110)		
sewerage			-0.492*** (0.143)	
service delivery				-0.317** (0.139)
white	0.175 (0.614)	0.112 (0.616)	0.0612 (0.598)	0.143 (0.610)
log_pop	-0.0497* (0.0288)	-0.0459 (0.0298)	-0.0470 (0.0304)	-0.0451 (0.0302)
female	-0.0551 (0.402)	0.0554 (0.396)	-0.0406 (0.376)	-0.0177 (0.388)
traditionalfrac	0.0600** (0.0267)	0.0591** (0.0273)	0.0638** (0.0270)	0.0632** (0.0271)
housetype	-0.121 (0.183)	-0.140 (0.194)	-0.0108 (0.195)	-0.0694 (0.197)
opp_control	0.0986*** (0.0192)	0.106*** (0.0187)	0.113*** (0.0191)	0.108*** (0.0187)
employed	0.0288 (0.124)	0.111 (0.119)	0.160 (0.117)	0.117 (0.118)
log_income	0.126*** (0.0439)	0.138*** (0.0486)	0.139*** (0.0459)	0.142*** (0.0470)
Constant	-0.464 (0.425)	-0.489 (0.450)	-0.592 (0.469)	-0.537 (0.443)
N	426	426	426	426

Notes: Results above are from Mundlak Zero-Inflated Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above, as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016 and IEC data.

Table 10 presents the estimated changes in spoiled ballots during local elections, given improvements in public service delivery. By framing spoiled ballots as a probable means of silent protest, one would expect a spoiled ballot to mark voter dissatisfaction. This argument is supported by studies⁵⁸ who suggest that spoiled ballots are an indicator of protest.

⁵⁸ Reynolds (1999) and Power and Roberts (1995).

Table 10: Mundlak Negative Binomial Regression - Change in service delivery on the number of spoiled ballots for local elections

Number of spoiled ballots (local elections)				
	[1]	[2]	[3]	[4]
water	-0.635 (0.864)			
refuse_col		-0.947 (0.654)		
sewerage			-2.067** (0.918)	
service delivery				-1.282 (0.813)
white	3.584 (3.054)	3.600 (3.050)	3.080 (3.060)	3.245 (3.054)
log_pop	0.00364 (0.0915)	0.0240 (0.0919)	-0.00838 (0.0920)	0.0159 (0.0923)
female	3.468* (2.059)	3.112 (2.035)	3.010 (2.004)	2.947 (2.043)
traditionalfrac	0.00560 (0.125)	-0.00443 (0.125)	0.0203 (0.125)	-0.635 (0.590)
housetype	2.056** (0.949)	2.067** (0.949)	2.446** (0.971)	2.223** (0.970)
opp_control	-0.277*** (0.0961)	-0.291*** (0.0970)	-0.246** (0.0991)	-0.258*** (0.0981)
employed	-0.409 (0.647)	-0.856 (0.617)	-0.724 (0.614)	-0.900 (0.614)
log_income	1.142*** (0.210)	1.214*** (0.221)	1.209*** (0.209)	1.274*** (0.216)
Constant	-11.55*** (1.880)	-12.14*** (1.941)	-11.74*** (1.892)	-12.53*** (1.920)
N	426	426	426	426

Notes: Results above are from Mundlak Negative Binomial Regressions. Additional regressors for all control variables as required by the Mundlak approach are included in regression analysis but excluded from output presented above as it is not required for interpretation. Robust standard errors in parentheses.

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Source: Own calculations using Census 2011, CS 2016, and IEC data.

This implies that one could expect improvements in public service delivery to bring about a decrease in the number of spoiled ballots. If statistical significance were to be ignored, the sign of each of the public service delivery coefficients is as we would expect. The results, however, only emphasise sewerage provision as being significantly and negatively correlated with spoiled ballots. This finding may consequently provide some evidence to suggest spoiled ballots as an alternative route to political accountability in the context of public service delivery. Driscoll and Nelson (2014:12) make particular mention of leaders in the developing world who are quick to dismiss spoiled ballots because they think they are purely the result of misinformed publics, voter apathy or poorly educated voters. These authors argue that spoiled

ballots may in fact be an indication of a latent, possibly stifled dissatisfaction with the status quo and should in fact be considered as a very informative signal to the dominant party incumbent.

7. Conclusion

Against the backdrop of South Africa's unique political landscape, the findings of this study seem to highlight that even though the country is indeed a democracy, the way in which its democracy functions is not as straightforward as we are led to believe. The underlying premise for this research stems from the notion of political accountability. This study makes important contributions to the debate on the extent to which citizens can hold government accountable. It investigates the routes of political accountability in a relationship between public service delivery, voting behaviour and protest action in South Africa.

This paper updates and expands the findings from previous authors de Kadt and Lieberman (2017) in an attempt to determine whether political accountability works as theory predicts in the South African context. A unique two-wave panel dataset was created from the 2011 Census, 2016 Community Survey, corresponding voting data from the Independent Electoral Commission and protest data from the Armed Conflict Location and Event Data Project. The study examined whether South Africans hold government accountable for service provision through the power of their vote. Surprisingly, the overall results seem to suggest a breakdown in the relationship between public service delivery and voting, confirming the findings by de Kadt and Lieberman (2017). However, new evidence of a positive relationship between water provision and voting behaviour is revealed when acknowledging that the dominant party incumbent differs by municipality during local elections.

The study further tests whether accountability through the mechanism of voting fails due to the existence of alternative accountability mechanisms. The primary alternative accountability mechanism examined here is protest action. Remarkably, there is evidence to confirm the hypothesis that South Africans consider protest action as an alternative route to achieve political accountability. The findings suggest that increased access to public service delivery (i.e., water provision, refuse collection and flush toilets) bring about fewer protests. Lastly, to give a more holistic view of alternative routes to accountability, this research introduces two other probable routes: voter turnout and spoiled ballots. Between the two, it appears that spoiled

ballots are more likely to be considered an alternative accountability route, although this finding appears to be conditional on the type of service considered.

On the public service delivery front, as documented by the descriptive statistics and the map analysis, there are signs of an overall vast improvement in access to the three main basic services considered here. It should be noted however, that at the same time much more still needs to be done. When examining the public service delivery variables independently, sewerage provision appears to be a strong predictor of voting and protest behaviour. Service delivery as a composite variable, denoted as access to water, refuse collection and sewerage simultaneously, also appears to be a very strong predictor of voting and protest behaviour in South Africa.

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Appendix

Figure 5: Proportion of households with access to piped water and protest locations by municipality, 2011

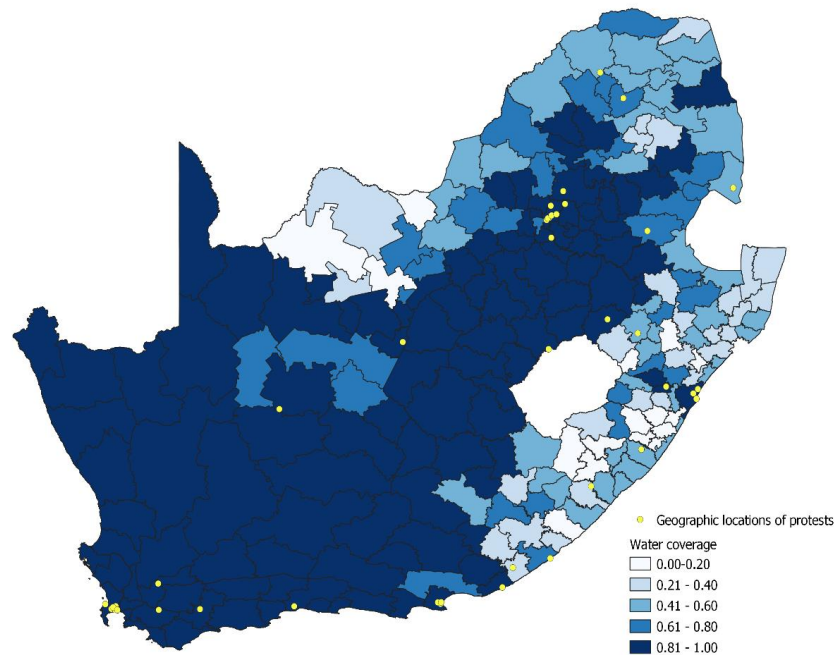
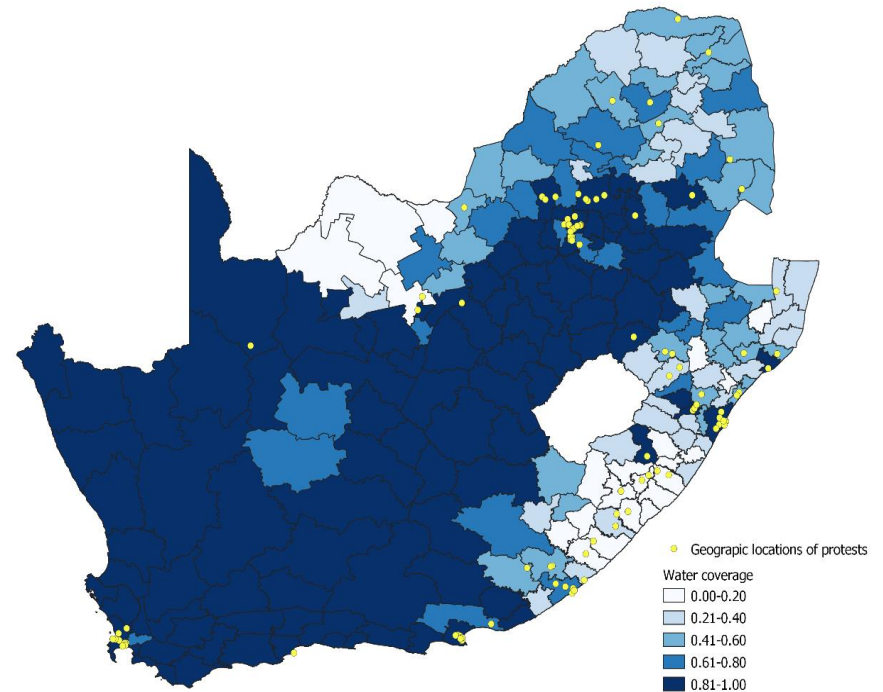


Figure 6: Proportion of households with access to piped water and protest locations by municipality, 2016



Source: Own calculations using ACLED, 2011 Census and CS 2016 data.

Figure 7: Proportion of households with access to regular refuse collection and protest locations by municipality, 2011

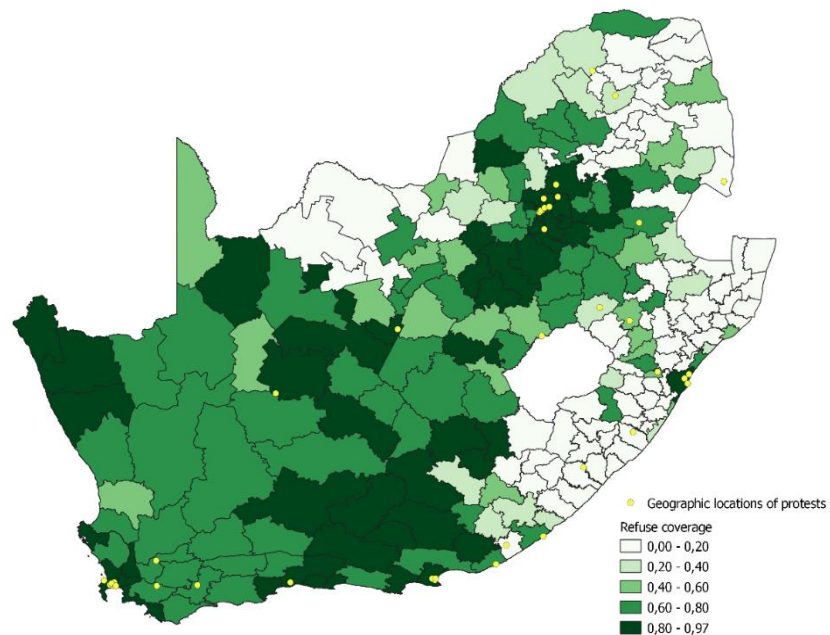
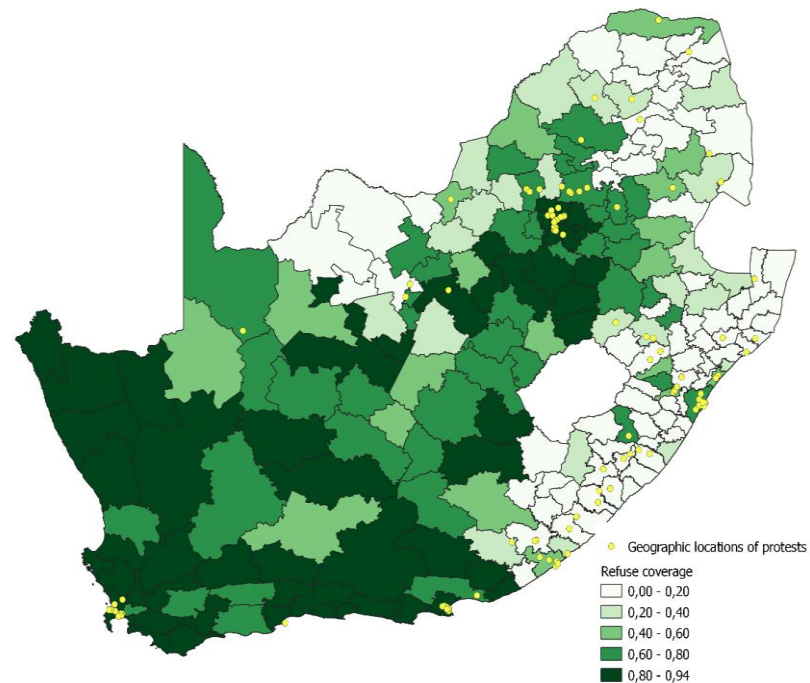


Figure 8: Proportion of households with access to regular refuse collection and protest locations by municipality, 2016



Source: Own calculations using ACLED, 2011 Census and CS 2016 data.

Figure 9: Proportion of households with access to flush toilets and protest locations by municipality, 2011

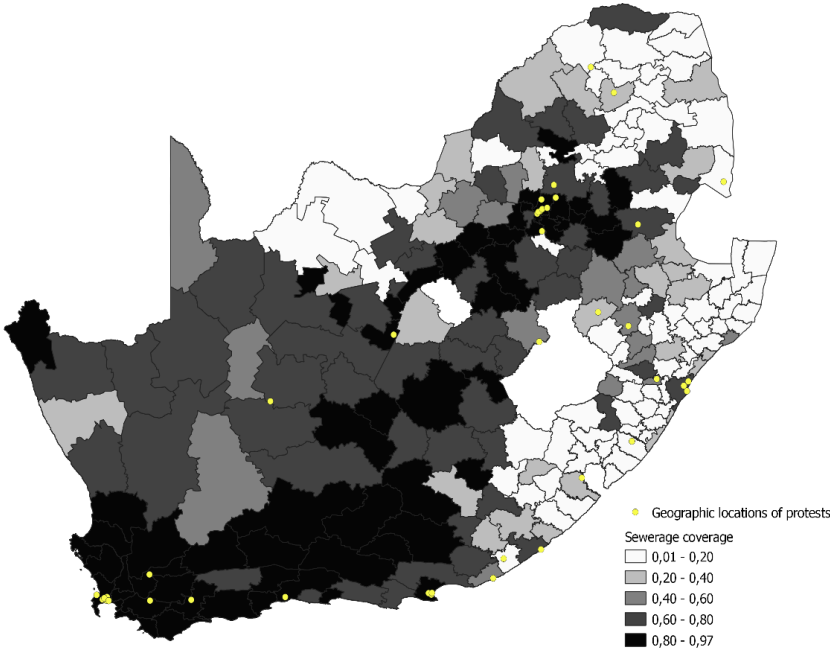
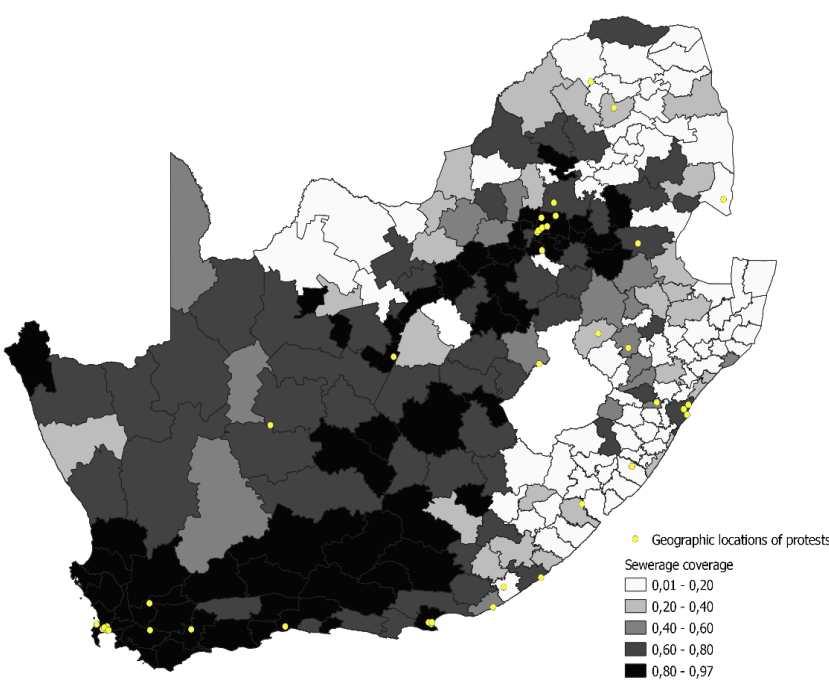


Figure 10: Proportion of households with access to flush toilets and protest locations by municipality, 2016



Source: Own calculations using ACLED, 2011 Census and CS 2016 data.

Figure 11: Voter turnout by municipality during 2011 local elections

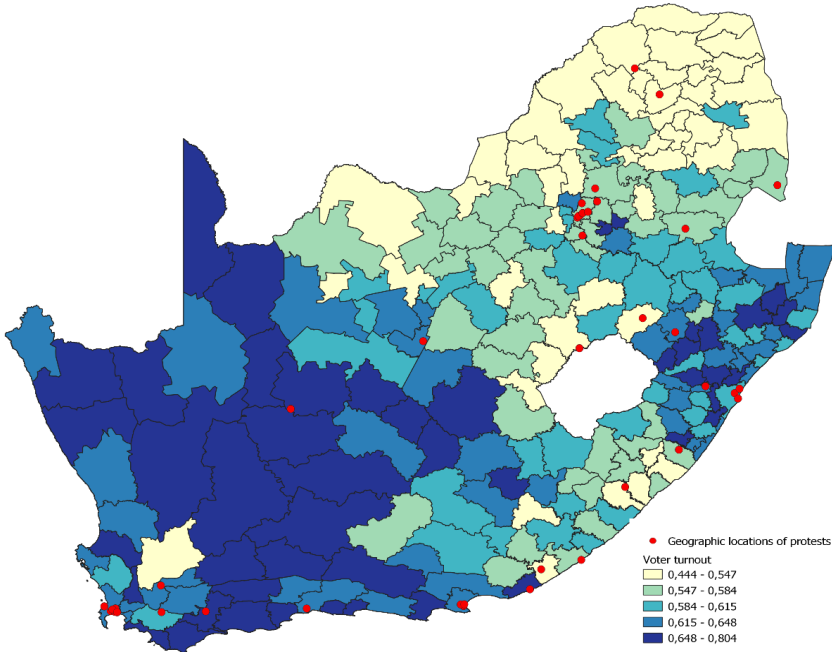
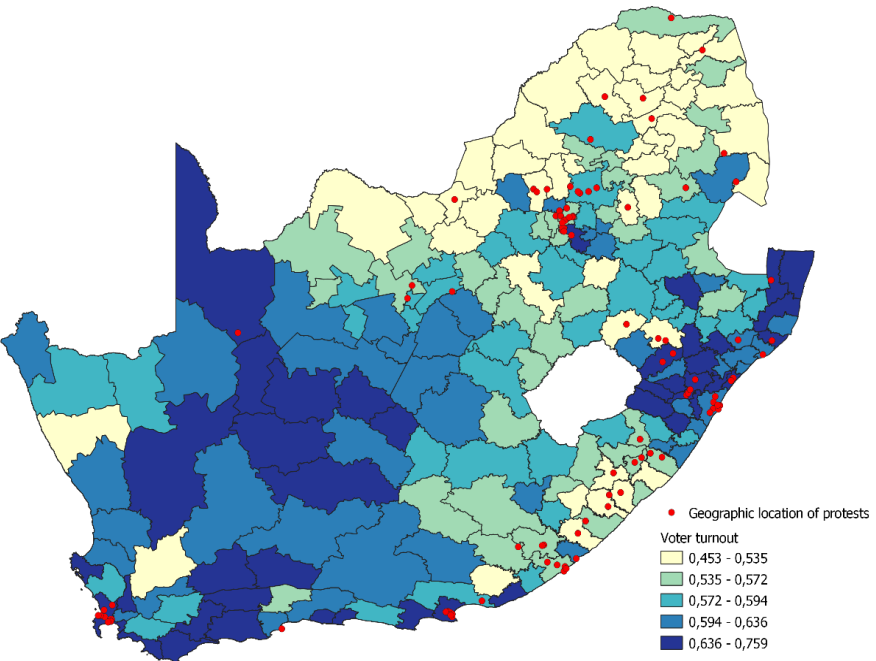


Figure 12: Voter turnout by municipality during 2016 local elections



Source: Own calculations using ACLED and IEC data.

Figure 13: Dominant party incumbent by municipality during 2011 local elections

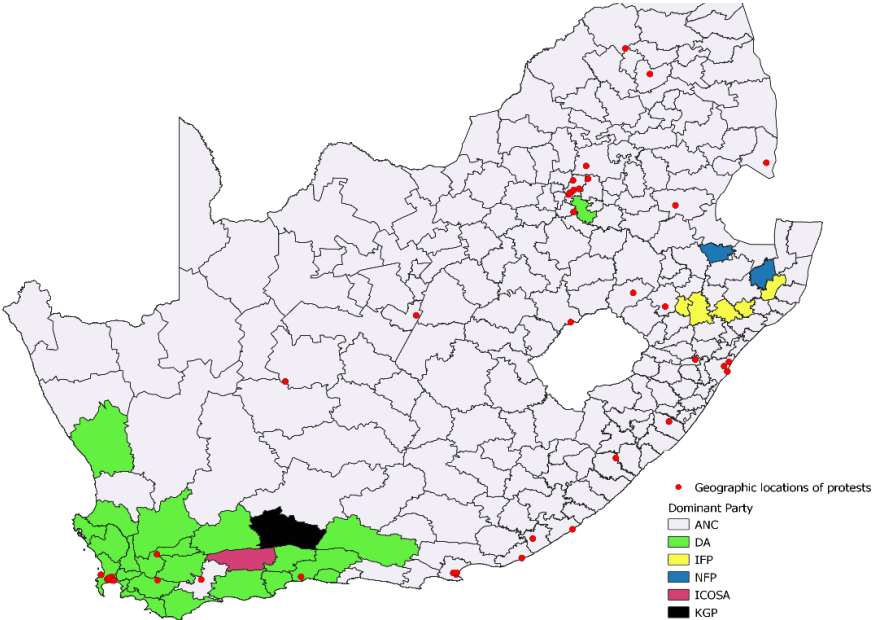
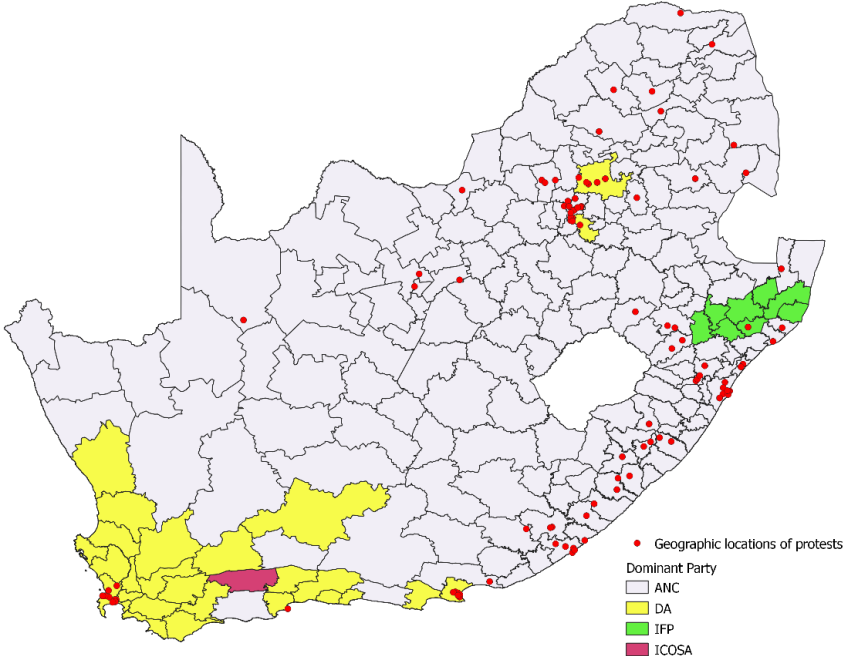


Figure 14: Dominant party incumbent by municipality during the 2016 local elections



Source: Own calculations using ACLED and IEC data.

Table 11: Variable description

Variable	Variable description
age	Age of household head in years.
employed	The household head is employed.
female	Fraction of the population where household head is female.
hh_size	Household size
housetype	Type of main dwelling (formal)
log_income	Average household log income
log_pop	Log population
opp_control	Indicator of whether the opposition ever controlled a particular municipality.
refuse_col	The proportion of households that have their refuse removed at least once a week.
service_delivery	A composite variable which represents the proportion of households with access to all three services, namely water, refuse collection and sewerage.
sewerage	The proportion of households with access to a flush toilet connected to a public sewerage system or a flush toilet with a septic tank.
traditionalfrac	Fraction of households staying on traditional land.
water	The proportion of households that have piped water inside the dwelling or piped water inside the yard only.
white	Fraction of the population where household head is white.