Gordon Institute of Business Science
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Business compliance to Gauteng's e-tolling

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Abstract

Companies have been faced with the decision of whether or not to comply with e-tolling since its inception in 2013. Media coverage on e-tolling has reflected many negative opinions, though these are mostly from private citizens. Despite the dismissal of legal challenges against e-tolling's implementation, collections of e-tolls remain well short of SANRAL's budgeted figures. Responsible decision makers within companies ultimately make the compliance decisions.

This research aimed to investigate business compliance to e-tolling. Relevant academic literature was reviewed in order to form a basis for exploration of this topic. The constructs identified from the literature were fairness of the e-tolling system, the efficiency of public spending with respect to the construction of the upgraded freeways, the financial impact that e-tolling is having on companies and whether companies are complying with e-tolling. Quantitative research was conducted on the responses received from surveys sent to members of the RFA.

The findings reveal that e-tolling is perceived to be an unfair system. E-tolling was having a negative impact on company finances yet, companies displayed an overwhelming compliance toward e-tolling. The findings also revealed that much of the literature relevant to individuals was not applicable to companies.

Key Words

Tax fairness

E-tolling

Tax compliance

Tax aversion

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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Table of Contents

Table of Tables

Table of Figures

List of Abbreviations

The Act	Transport Laws and Related Matters Amendment Act (2013)
CA	Cronbach's Alpha
CEO	Chief Executive Officer
CSR	Corporate Social Responsibility
DRC	Democratic Republic of Congo
GDP	Gross Domestic Product
GFIP	Gauteng Freeway Improvement Project
King III	The King Code of Corporate Governance for South Africa report (2009)
KMO	Kaiser-Meyer-Olkin
OUTA	The Opposition to Urban Tolling Alliance
PCA	Principal Component Analysis
RFA	The Road Freight Association
SANRAL	South African National Roads Agency Limited
SARS	South African Revenue Service
SPSS	IBM Statistical Package for the Social Sciences Version 23

1 Definition of problem and purpose

The research explores compliance by business to e-tolling and key reasons for this.

1.1 Background and rationale for research

The Transport Laws and Related Matters Amendment Act (Act) was signed into law on 9 October 2013 and became effective on 3 December 2013 (Government Gazette, 2013). The Act had the effect of implementing e-tolling in Gauteng. The Minister of Transport on behalf of the South African Government (Government) holds the South African National Roads Agency Limited's (SANRAL) entire share capital (SANRAL, 2015). SANRAL is responsible for running the e-toll system on behalf of Government. Equating e-tolling to taxation is appropriate as the proceeds revert to Government.

E-tolling impacts all road users in Gauteng that use freeways. The costs of compliance for business may be substantial relative to the number of vehicles that a business operates and the frequency with which their vehicles make use of the e-tolled freeways in Gauteng. The problem is relevant to all businesses that use vehicles in Gauteng, as they will be billed for the use of tolled freeways.

Levels of compliance with e-tolling are lower than SANRAL's budgeted figures. Results released to the media show that SANRAL collected only 62% of its forecast e-toll revenue for the financial year, resulting in an e-toll shortfall of R588 million (Moneyweb, 2015). SANRAL relies heavily on 262,000 key account holders that make regular e-toll payments in order to bolster the low compliance levels. These account holders are mainly vehicle rental companies and owners of commercial fleets. SANRAL has budgeted for collections of R300 million after offering consumers a monthly cap on contributions in order to mitigate resistance to the e-tolling system. Actual collections are well short of the budgeted figure.

SANRAL stated that only 1,2 million vehicles of the estimated 2,5 million vehicles that use the Gauteng freeways on a monthly basis are registered for e-tolling. At present, compliant road users who regularly pay their e-tolls feel increasingly prejudiced by the lack of consequences for the defaulters and increasingly also revert to non-payment (Moneyweb, 2015).

In July 2014, Gauteng Premier David Makhura announced the appointment of a review panel (Review Panel) to investigate the social impact of e-tolling. The 15-member Review Panel released their report on 30 November 2014 and found recognition and appreciation for the improved road infrastructure but also a high level of anger and frustration about the funding mechanism of e-tolls (Gauteng Provincial Government, 2014). "The general sense of the illegitimacy of transport policy, has led to a large degree of non-compliance with payment of e-tolls" (Gauteng Provincial Government, 2014, p. 40). The report served to further fuel the overwhelming non-compliance of motorists.

Businesses are faced with the question of whether or not to comply with e-tolling. The decision may comprise numerous factors, two essential ones being tax morale and financial implication. Tax morale incorporates the voluntary compliance with tax laws to create a social norm of compliance and includes a set of underlying motivations leading to tax compliance (Luttmer & Singhal, 2014).

Moral clarity should be used to consider the question of compliance to taxation in the business context (Wiltermuth & Flynn, 2013). Moral clarity is the extent to which people see their behaviours in clear terms of right or wrong. Overriding financial perspectives may be the dominant factor in deciding what constitutes the right decision for the business. Such a decision may be in conflict with the Act, which requires compliance ahead of financial considerations. Where taxes are considered to be too high, compliance levels are likely to be low (Molero & Pujol, 2012).

Shareholders invest in businesses with the expectation of a positive return on their investment. Generating profits including positive cash flows may not be the sole

responsibility of business (Friedman, 1970) but would certainly be an important consideration if the business were to survive and grow. Business leaders need to ensure the survival of their business ahead of compliance requirements. Businesses are unlikely to act voluntarily in the public interest at the expense of shareholder interests. Large companies frequently make public statements to the effect that they are responsible corporate citizens and comply with relevant regulations (Karnani, 2010) to add weight to their Corporate Social Responsibility (CSR) compliance initiatives, though smaller companies are not exposed to such onerous requirements.

Businesses complying with e-tolling suffer a cost and administrative disadvantage compared to their non-compliant competitors. When applying game theory, the actions of competitors would influence the actions of other "players" in the "game". Those that move first and comply are likely to translate such compliance into increased pricing whereas second-movers would enjoy the benefit of a lower cost base. This situation is likely to continue for as long as defaulters suffer no consequences. First movers may react by reducing compliance in order to remain competitive.

In summary, this research will attempt to gain a deeper understanding of the impact that e-tolling is having on businesses in South Africa.

The research aims to:

- Determine compliance levels by companies to e-tolling
- Analyse companies' decisions to comply to e-tolls in terms of tax morale and financial considerations
- Establish whether e-tolling is considered a fair tax by businesses
- Establish the impact that e-tolling is having on the finances of businesses in South Africa
- Determine whether the introduction of e-tolling has had an impact on the daily operations of companies
- Establish whether companies are concerned about the possible repercussions of non-compliance

This document will provide a brief literary review on the topic of tax morality and will be expanded in order to build a better basis for the question to be explored. This will lead to a restatement of the research problem in terms of hypotheses that will be tested. A discussion of a suitable research methodology will follow.

2 Literature review

2.1 Tax morality

2.1.1 Tax fairness

The economics literature on tax evasion is small but expanding. The basic analysis dates back to 1972, which states that taxpayers choose an optimal level of tax evasion given the level of penalty, probability of getting caught and their own level of risk aversion (Allingham & Sandmo, 1972). The focus of the literature has also been on individuals – specifically with reference to tax compliance and applied theories of tax morality.

Building on this basis, tax fairness is a factor that affects compliance (Luttmer & Singhal, 2014). It is important to establish whether a tax is seen as fair prior to determining the compliance levels toward that tax. Taxes that are seen as fair are more likely to be complied with (Luttmer & Singhal, 2014). Individuals do not like paying taxes and undertake a variety of actions in order to reduce their tax liabilities when taxes are seen as unfair (Alm & Torgler, 2011). Research by Alm & Torgler found that a surprising number of individuals were complying with tax regulations, as measured from audits conducted on tax returns submitted by individuals. Few studies have measured tax fairness relating to corporates.

One of the drawbacks of studies conducted on the topic of tax fairness is that they have been conducted in the form of laboratory experiments and field experiments. Assessing attitudes around the fairness of tax has been difficult to prove in the context of laboratory and field experiments (Luttmer & Singhal, 2014).

A rare real-life example testing tax fairness comes from the events experienced in the United Kingdom in 1989-1990 when the Thatcher government introduced a poll tax that replaced a tax based on property values (Besley, Jensen, & Persson, 2014). The backlash that followed at the time resulted in evasion of this tax due to the widespread

perception that the tax was unfair, as it was not related to the ability to pay the tax. The tax was repealed three years later and marking a return to tax based on property values. This example is rare not only in that it is a real-life example but also in that the "unfair" tax was repealed because of mass public protests that influenced political will in the United Kingdom.

Self-employed people and small firms have also been largely ignored in empirical literature, as the focus of research has been mainly on individual taxpayers and laboratory experiments. This group has more opportunity to engage in tax evasion and has lower tax morale than larger businesses (Gangl, Torgler, Kirchler, & Hofmanna, 2014).

Public policies and institutions shape the risks and responsibilities of citizens, through feedback processes. The implementation of new regulations does not result in a rapid changing of citizens' minds and beliefs. Instead, there is a certain degree of stability in the beliefs of economic fairness in a society (Lopes, 2010). Transforming the mind-set of citizens is a slow-moving process that relies on changes in experiences, expectations and processing feedback based on these events. The introduction of a "new" tax therefore cannot be assumed universally acceptable certainly during the early stages of introduction. Non-compliance to a tax may be prevalent in the early stages of introduction until there are negative consequences to non-compliance or the benefits of compliance are clear.

Negative consequences for failure to comply with e-tolling were one of the measures announced in May 2015. The Government lowered the cost of e-tolls, allowed motorists a free number of e-toll transactions for a year and a lower cap on the maximum amount charged during a month. Importantly though, the Government also announced that motor vehicle licence renewals will be linked to the payment of e-tolls as a key enforcement tool (Government Gazette, 2015). Legislation linking the payment of e-tolls to vehicle licence renewals has not yet been enacted and as such, the effectiveness of this measure is unknown. SANRAL's present debt collection practices have not been particularly aggressive and the introduction of the new e-tolling rates allows road users a

further six-month window period to settle their outstanding e-toll debt (Government Gazette, 2015).

The introduction of new regulations are not the sole reason for a lack of tax compliance, instead the actions of other taxpayers play a role in influencing compliance levels. Taxpayers are more likely to cheat on their taxes depending on the perceived compliance of their fellow taxpayers (Traxler, 2010). Where other members of society evade taxes, taxpayers find it easier to justify their low levels of compliance (Traxler, 2010).

The regulations governing e-tolling have not been applied consistently across all industries. An example is the exemption of taxis from paying e-tolls, which are part of a "for-profit" industry. Other "for-profit" industries are required to pay for e-tolling. This inconsistency in the regulation is likely to be seen as unfair and unnecessarily complex by those that are required to pay for the use of e-tolled freeways. It is also likely to influence their payment behaviour. When assessing payment behaviour, high trust and morality are associated with less complex regulation and vice versa (Tammi, 2013). When the complexity of regulation increases, risk behaviour also increases.

Public policy should be careful not to increase the prevalence of evasion-minded taxpayers and should rather attempt to decrease them (Prinz, Muehlbacher, & Kirchler, 2014). Comments describing e-tolling as "administratively too cumbersome" by the Gauteng Premier at the release of the Review Panel's findings (SAPA, 2015) adds credibility to the complaints of society against the e-tolling system. The Gauteng Premier tasked the Review Panel with investigating the social impact of e-tolling. The Premier's comments may have contributed to evasion.

2.1.2 The impact of public spending inefficiency

In developing countries, the link between public capital spending and capital accumulation, and hence growth, is weakened by evidence of low public spending efficiency. The notion that public investment spending is equal to capital accumulation

rests on the assumption that public investment is inherently productive (Dabla-Norris, Brumby, Kyobe, Mills, & Papageorgiou, 2012). High levels of inefficiency, waste, or corruption often distorts the impact of public spending on capital projects, leaving a trail of poorly executed and ineffective projects. A scaling-up of investment in developing countries is vital, though the link between investment and development outcomes depends critically on the quality and efficiency of public investment (Dabla-Norris et al. (2012).

The willingness to pay taxes depends on the individual's relationship with the state. Individuals may view taxes as part of a social contract; being tax payments in exchange for services provided by the state. Tax compliance may be affected by attitudes toward government or perceptions about the fairness of the tax schedule (Hofmann, Hoelzl, & Kirchler, 2008).

Unfairness of the fiscal exchange and inefficiency in public spending may lead to a lower compliance level of paying taxes by taxpayers (Barone & Mocetti, 2011). Where citizens see the benefit in their tax contributions, their tax morale is expected to be higher. Those that feel their taxes are too high or who feel that public funds have been wasted are likely to have a low tax morale (Molero & Pujol, 2012).

The Review Panel found that the overhead costs of administration of the e-tolling project was not exorbitant according to international standards, though it was also largely dependent on increasing compliance levels for the benefits of economies of scale to come into effect (Gauteng Provincial Government, 2014). Yet, with diminishing compliance levels, the costs of administration are increasing relative to the complying public, further fuelling low tax morale. Overhead recovery is one aspect of the cost of the Gauteng Freeway Improvement Project (GFIP) though this is prospective, the other being the initial construction costs which are historical. Taxpayers consider all aspects when assessing the efficiency of public spending.

Taxpayers have a higher willingness to pay taxes if institutional conditions are strong and if taxpayers are satisfied with the government activities (Alm & Torgler, 2011).

Governments should use a multifaceted approach that emphasises not only enforcement but also service and trust in order to increase compliance levels.

Highlighting severe cases of evasion and fines in the media may lead to more evasion in the public rather than less. This may be due to media reports on tax evasion leading citizens to believe that such behaviour is ‘‘normal’’ and frequent. Instead of reporting cases and percentages of evasion, governments would achieve better results through officially mentioning cases of strong honesty and percentages of people paying their share correctly, accompanied by reports on public goods provided by the state funded by tax payments (Maciejovsky, Schwarzenberger, & Kirchler, 2012).

Citizens need reminding of the efficiency with which government spends their taxes, as this may lead to greater acceptance of tax. In the United Kingdom, non-compliance to taxes fell in response to reminder letters that emphasized the ways in which tax revenue financed public goods (Hallsworth, List, Metcalfe, & Vlaev, 2014). Emphasizing the good ways in which tax revenue is spent is unlikely though to result in greater compliance if there is mistrust of government. Remedies to induce higher tax compliance perform much better if they are accompanied with improvements in governance (Cummings, Martinez-Vazquez, McKee, & Torgler, 2009).

There is a strong link between good governance and compliance with law. Good governance does not exist separately from the law. It is entirely inappropriate to unhinge governance from the law (Institute of Directors Southern Africa, 2009). The King Code of Corporate Governance for South Africa report (2009), (King III) offers guidelines for good governance practices.

The Minister of Transport appoints both the Chairperson and Chief Executive Officer (CEO) of SANRAL (SANRAL, 2015). These are major corporate governance guidelines where King III has not been complied. It is therefore clear that SANRAL receives instructions from Government and abides by these policies in acting in the interest of its shareholder above other stakeholders.

One of the overarching principles of King III is that directors should consider the legitimate interests and expectations of all stakeholders, not only those of shareholders. The stakeholders of SANRAL are extensive and include the public and businesses that make use of, and are required to contribute toward the maintenance of SANRAL's infrastructure. SANRAL's policy is to manage stakeholder relationships and concerns on a project-by-project basis or as particular circumstances dictate (SANRAL, 2015, p. 109). This policy offers little in the way of specific information as to how it deals with stakeholder concerns.

Stakeholders complained against the fact and process that led to the implementation of e-tolling. The Opposition to Urban Tolling Alliance (OUTA), a civil action group, has been critical in its assessment of SANRAL's rollout of e-tolling. "SANRAL had taken on something far more complex than they could handle and that it was fraught with inefficiencies, was extremely costly and they ignored far simpler methods, which exist within Government policy to collect revenue for this project" (OUTA, 2015).

2.1.3 Trust in government

There is a negative correlation between the acceptability of tax evasion and confidence and trust in government (Slemrod, 2002). The final cost to finance the construction of the GFIP was in excess of R50 billion. The 2014 SANRAL annual report shows trade receivables of R951 million, up from R133 million in the prior year (SANRAL, 2015). Trade receivables comprises mainly of e-toll receivables. This represents a 615% or six-fold increase in outstanding e-toll receivables from 2014 to 2015. If the amount of outstanding receivables owing to SANRAL were used to measure the financial success of e-tolling, it could not be argued that the system is successful.

The role of trust in the legal system and parliament affects tax morale (Alm & Torgler, 2006). Legal challenges were brought against the implementation of e-tolling by stakeholders being the Opposition to Urban Tolling Alliance, the South African Vehicle Renting and Leasing Association, the Quadpara Association of South Africa and the South African National Consumer Union. On 9 October 2013, the Supreme Court of Appeal issued judgment dismissing the appeal against e-tolling (Opposition to Urban

Tolling Alliance v The South African National Roads Agency Limited, 2013). This ruling ended all legal challenges against e-tolling's implementation and as such, the Act is effective. This ruling was the final word in various protracted legal battles to prevent the implementation of the e-tolling system. This ruling set a precedent for the rolling out of e-tolls to areas outside of Gauteng.

Compliance with taxation is sensitive to signals emitted by political leaders, social institutions and by the presence of thriving informal sectors (Cullis, Jones, & Savoia, 2012). Trust in the President and his officials are closely associated with public spending efficiency and are positively associated with an individual's propensity to pay taxes (Torgler, 2005). Though Torgler undertook his study in 2005, his findings are highly relevant in the current South African context, when considering the attention that spending on the President's private residence has attracted in the country. This is one example that epitomises what South Africans feel.

"The expenditure incurred by the state in respect of the measures taken, including buildings and other items constructed or installed by the Department of Public Works at the request of the South African Police Service and Department of Defence, many of which went beyond what was reasonably required for the President's security, was unconscionable, excessive, and caused a misappropriation of public funds" (Public Protector, 2014, p. 430). These findings of misappropriation of public funds by the Public Protector are a serious indictment of the spheres of government mentioned and are likely to damage the public's perception of efficiency associated with public pending. Trust in government can only suffer because of the report's findings.

The Global Competitiveness Report 2014-2015 ranks South Africa in 96th place out of 144 economies when measuring diversion of public funds; and in 89th place out of 144 when measuring a general lack of public trust in politicians (World Economic Forum, 2014). International studies have placed rankings on, and added to the credibility of the complaints of South Africans. The comments by the Public Protector and Global Competitiveness Report add considerable weight to the argument that South Africans' public funds are not spent efficiently. The Government cannot consider enforcing e-tolling

in isolation without considering the serious reputational damage that other public spending inefficiency is likely to have on the public.

2.1.4 Implication of complexity on compliance

Studies on individual taxpayers found that tax law complexity gives rise to what is considered “socially acceptable tax avoidance” instead of “socially unacceptable tax evasion” (Nugent, 2013). Tax law complexity may increase or decrease tax compliance depending on perceptions and conditions. Although people may recognise the moral obligation to pay taxes, there is likely to be a question of what amount fulfils the moral obligation. Taxpayers may associate complexity with inequality and unfairness, thereby feeling that noncompliance is justified in order to correct the inequalities they believe they are suffering (Nugent, 2013).

In low-income countries, the perception that a tax system is unfair may hinder the emergence of a norm of compliance (Besley & Persson, 2014). Activity in the areas of tax avoidance and evasion are key factors for developing countries such as South Africa. Compliance rates reduce over time, primarily due to the house money effect (Durham, Manly, & Ritsema, 2014). House money effects refer to taxpayers who take increasingly more risks with their profits, which lead to a decrease in tax compliance.

High trust and morality are associated with less complex regulation leading to an increase in compliance rates over time (Tammi, 2013). When the complexity of regulation increases, risk behaviour also increases. It is therefore important for any tax system that aims to have a high compliance rate to simplify the tax system and provide increased taxpayer education and assistance (Bobek, Hageman, & Kelliher, 2013). The South African Revenue Service (SARS) has numerous tax offices around the country that assists taxpayers, both individual and corporate in becoming tax compliant. Taxpayers also have the option to make use of electronic filing (e-filing) for most of the compliance functionality.

Progressive tax, the taxing mechanism in which the taxing authority charges more taxes as the income of the taxpayer increases is significantly more beneficial for government than proportionate tax, which is when a flat percentage rate is charged (Heinemann & Kocher, 2013). In contrast, e-tolling rates are charged relative to the number of toll plazas passed on the tolled highways, they are not linked to income. Variable rates charged according to day travelled (weekday vs weekend) and time of day travelled (peak vs off-peak) further add to the complexity of understanding the e-tolling system. The rates charged for e-tolling were lowered in response to the finding of the Review Panel however the basic model of variable pricing remains unchanged (Government Gazette, 2015).

SANRAL has 14 customer service centres at fixed locations in close proximity to freeways and a further 20 customer service centres at retail centres and temporary locations to assist the public with payment, registrations and queries (Government Gazette, 2015, p. 46). SANRAL has also established a toll free number for queries to assist the public. These efforts do not however address the question of the complexity of the e-tolling system.

The new tariffs announced in the Government Gazette that became effective on 2 July 2015 detail 11 pages of tariffs relative to vehicle category, frequent usage discounts, time of day charges and maximum amount to be charged. Perhaps the most questionable policy decision is the differential pricing of the 47 toll plazas for a similar vehicle category (Government Gazette, 2015, p. 7). In short, government has chosen a complex system for the billing of e-tolls. This is in contrast to the flat tolls rates that are charged on other national roads administered by SANRAL, such as the N3 and N1. Payment options for e-tolls are easier to understand than the billing system, taking the form of prepaid, post-paid or via debit order with or without the e-tag option. Taxpayers are inherently negative toward paying taxes and should not be given additional reason not to pay due to complexity of the system (Alm & Torgler, 2011). Government should be aware that negative reviews and opinions are likely to influence others (Anderson & Simester, 2014).

Well-informed tax authorities would note that compliance rates are generally higher in a progressive than in a proportionate tax system (Heinemann & Kocher, 2013). A change from a proportionate to a progressive scheme significantly decreases tax compliance compared to the reverse change. A switch from a progressive to a proportionate system brings about a regime change premium whose size is quite remarkable in comparison to other influences (Heinemann & Kocher, 2013). An example of a progressive scheme is charging more tax as income increases, whereas an example of a proportionate scheme would be charging the same percentage irrespective of income. By charging the same rate for a vehicle category per toll plaza passed, government could reduce complexity of the e-tolling system.

2.2 Financial impact on businesses

2.2.1 Tax avoidance and corporate responsibility

Businesses can never escape the need to generate profits (Friedman, 1970). Profits result from revenue exceeding all expenses and costs, including taxation. Businesses need to balance the need to generate profits with the need of appearing to be socially responsible.

Large businesses frequently reduce their tax burdens legally through the commitment of substantial resources for the goal of avoiding tax (Dowling, 2014). Businesses need to consider the spirit of the law as well as the letter of the law, but will argue that for as long as they are operating within the letter of the law, they are law-abiding corporate citizens.

Tax avoidance, which is the legal reduction in taxes, should not be confused with tax evasion. Tax avoidance is typically accomplished by designing and structuring legal economic transactions in an effort to minimize corporates' tax liability. In several cases, avoidance could be encouraged by tax legislation with favourable tax treatment that indirectly rewards societal economic values, such as savings, financial planning and risk management (Ritsatos, 2014). Businesses interrogate relevant tax legislation and use it to their advantage in order to gain the maximum financial benefit.

Corporate codes of conduct that advocate corporate responsibility would seem to be in conflict with the practice of tax avoidance. Financial factors may take preference over corporate responsibility and may lead to tax avoidance. Businesses will assess the financial impact of complying with an additional tax prior to complying. Increasing costs coupled with reducing demand in an underperforming economy may carry greater weight than corporate responsibility to comply with an additional tax regulation such as e-tolling. Businesses can therefore never be socially responsible due to the trade-offs that are required in the running of their businesses (Devinney, 2009). Factors that influence tax avoidance include that it adds to profit, it leaves more money for employment and that it is a signal to government not to abuse its tax raising power.

E-tolling's impact on a business' transport costs and hence financial performance is relative to the extent and frequency with which their fleets operate in Gauteng. Studies have found that transport volumes are sensitive to transport costs. The elasticity of trade volumes with respect to transport costs is estimated at -2,5 (Gruber & Marattin, 2010). By halving transport costs, volumes of trade would increase by a factor of five, or stated conversely, increasing transport costs by 20% would result in a decrease in volumes of trade by 50%. This is consistent with the work of Henderson, Shalizi, & Venables, (2001, p. 88) who found that the "doubling of transport costs reduced trade volumes by around 80%". This would be true in Gauteng, providing that viable alternative routes or modes of transport were available. In the absence of alternatives, corporates may choose to continue using existing routes but to evade the cost.

The primary reason against tax avoidance is that payment of tax is corporate citizenship at its most important (Christensen, 2011). Opportunistic and short-term ventures driven only by the profit motive are becoming less acceptable in an informed society. Stakeholders frequently bring corporations that pursue strategies based on short-term goals into disrepute (Bardy, Drew, & Kennedy, 2012). Strategies that not only add to business value but also lead to long-term economic and social improvements are increasing in significance in responsible corporates. Serving the needs of customers at the top of the pyramid, typically shareholders, is becoming less important than meeting the needs of those at the bottom of the pyramid who benefit from social responsibility by increasing ranks of the middle classes (Bardy, Drew, & Kennedy, 2012).

Businesses facing identical pressures react in different ways and for different reasons. In the presence of competing stakeholder expectations, managers' responses to such expectations and decisions depend on the degree of consensus among managers in their readings of the environment (Crilly, Zollo, & Hansen, 2012). Tax avoidance is likely to be lower in organisations with a higher level of corporate social responsibility (Lanis & Richardson, 2015).

2.2.2 Additional administration costs for business

There is a clear and significant negative relationship between transport networks and trade and transport margins (Schürenberg-Frosch, 2014). This relationship considers only an increase in road network and the resulting increase in competition. Better transport networks reduce transaction and transport costs, thereby negatively affecting the margins of transport companies. The increase in taxation in the form of tolls adds an additional category of cost to businesses. Businesses will be in favour of a funding method that has the least possible impact on finances.

SANRAL has adopted the "user-pay" principle whereas civil action group OUTA advocate a fuel tax method of recovery (OUTA, 2015). OUTA argues that there are cheaper methods of funding the cost of the freeway upgrades such as through an increased fuel levy. This may have advantages over the "user pay" principle currently in use, as recovery would come from legal fuel sales resulting in a higher compliance rate than is presently occurring under the "user-pay" principle. The "user-pay" principle refers to payment for usage of road networks.

Fuel taxes are decreasing globally due to the increasing use of fuel-efficient vehicles as well as a move in developed counties to electric vehicles (Zhao, Guo, Coyle, Robinson, & Munnich, 2015). South Africa should not be expected to be any different from the rest of the world in moving toward fuel efficiency and "greener technologies". The effects of this may take years to be fully realised, as existing motor vehicles need replacing with new, more fuel-efficient vehicles.

South Africa could reap substantial gains in terms of growth and equity if its level of infrastructure development were to catch up, or even just keep up, with those of developed countries. Speeding up infrastructure development would cost, by some estimates as much as 15% of Gross Domestic Product (GDP) (Calderon & Serven, 2010). The Government has acknowledged that the country has missed a generation of capital investment in roads, but also that the cost of this catch up will be borne by the road users. "The Commission's view is that in the long term, users must pay the bulk of the costs for economic infrastructure, with due protection for poor households" (National Planning Commission, 2012, p. 35).

Businesses and other road users will not escape the burden of having to pay either in the form of e-tolls, in the form of increased fuel levy or through a different funding method that has yet to be announced. The principle of "user-pay" is evident both in SANRAL policy and in the National Development Plan, which is a blueprint for South Africa's development to 2030. There are differing views on the most appropriate funding method. Heavier commercial vehicles pay more in fuel taxes and transportation fees than light vehicles, yet they impose higher costs on road networks than are recovered through their payments (Zhao et al., (2015).

The fuel levy route may be administratively less onerous for businesses, yet funds generated may be insufficient to cover the costs of the GFIP. The shortfall in funding likely to arise from an increased fuel levy may be less than the current shortfall form non-compliance to e-tolling. OUTA proposes various alternative options for the funding of the GFIP. These options are through the National Treasury, the fuel levy, through the taxation of long distance toll roads and vehicle licence fees (OUTA, 2015).

SANRAL argued that the benefits of electronic tolling are time saving, energy saving and emission reduction. An optimal road toll system is the one that is acceptable, efficient, and fair to the users of motorways and results in economic benefits to society (Kramberger & Curin, 2011).

2.2.3 Change in operating behaviour

Regulation in developing countries faces problems that are fundamentally different from those in advanced economies (Estache & Wren-Lewis, 2009). In developing countries with weak institutions, any regulatory framework should consider limited regulatory capacity, limited accountability, limited commitment and limited fiscal efficiency (Estache & Wren-Lewis, 2009). It is therefore questionable as to why SANRAL chose a complex regulatory system in a developing country such as South Africa.

After decades of unpopularity, road tolls are gradually coming into wider use. Reasons for this are the technological progress in the cost of collection, to finance the construction of a bypass routes, and in some cases to discourage traffic (Westin, Franklin, Grahn-Voorneveld, & Proost, 2012). In regions where authorities can toll all traffic on a particular route, it will use this opportunity to set tolls higher than the marginal external costs and will under-invest in bypass capacity thereby negatively effecting businesses that make use of the bypass routes. The main driver for this decision is the contribution to tax revenue as opposed to the welfare of residents.

The theory of road improvement is that tolling will lead to reduced journey time, reduced costs and improved reliability (Olsson, 2009). Tolls should, according to this theoretical framework be placed on bypass routes where the authorities want people to drive in order to finance the construction without making local travellers unhappy. The use of tolling can have negative spill over effects in the form of reduced safety and increased congestion in other parts of the road network, if the pricing is set high enough to shift traffic from the main freeways onto bypass roads. To maximize efficiency, toll plazas should be positioned on city roads where the intention is to reduce traffic (Westin, Franklin, Grahn-Voorneveld, & Proost, 2012).

Concessionary tolling that is in effect on national routes such as the N1 (Musina to Gauteng) and N3 (Durban to Johannesburg) requires all vehicles to pay tolls, irrespective of where the vehicles are registered. Vehicles making use of alternative routes can avoid the compulsory tolls, though alternative routes are longer in distance than tolled routes and take longer to drive.

SANRAL elected to make use of Austrian technology for the e-tolling system. The differential toll pricing system implemented in Austria led to companies changing their operating behaviour as well as changing the registration region of their fleets in order to minimise the impact of the tolls (Einbock, 2006). Operators of foreign-registered vehicles that travel in South Africa have an advantage over South African registered vehicle operators due to the difficulty in enforcing the law on them. South African businesses with locally registered vehicles may elect to outsource their logistics functions as a method of avoiding e-tolls. Less drastic measures would involve the avoidance of tolled roads, though this may affect transit times and increase the total distance that is driven.

2.2.4 Decision making for compliance in businesses

Morality is as much a question of the fairness of the tax being levied, as it is on the people that are responsible for the decision making process. Strong leaders who display ethical values impart those values on their organisations (Schaubroeck, Hannah, Avolio, Kozlowski, Lord, Trevinno & Peng, (2012). It would be unrealistic to expect ethical values imparted by leaders to be adopted throughout their organisations.

An individual or collective of individuals make compliance decisions on behalf of an organisation. In organisations, ethical standards of professional conduct are often implicitly or tacitly held making it difficult for members to know which types of behaviour are permissible and which are not (Wiltermuth & Flynn, 2013). Decision making employees may receive mixed signals according to whom they ask for advice. The views "expressed by top management frequently differ from those expressed by immediate supervisors, close peers, or even an organization's formal code of conduct" (Wiltermuth & Flynn, 2013, p. 1002).

Individual decision makers have to make sense of the environmental pressures that their firms face and take what they see to be appropriate action. In the presence of information asymmetry between firms and their stakeholders, managers' responses to those pressures are intentional depending on how they perceive stakeholders' interests (Crilly, Zollo, & Hansen, 2012). Stakeholders' interests are therefore an influencing factor in how the decision maker reaches their decision.

In small businesses, owners are likely to perceive more opportunities not to comply with taxation than employed taxpayers are, as they are more likely to experience a lack of meaningful taxation knowledge. They are more likely to frame the decision of tax payments as painful losses (Kamleitner, Korunka, & Kirchler, 2012). By contrast, there is considerably greater distance between the owners of large businesses and the individuals responsible for tax compliance decisions. Leaders in large businesses may be heavily incentivised to reach a certain financial target for the company, resulting in an intentional policy to reduce taxes. Tax avoidance is therefore a well-established practice among large corporations (Dowling, 2014).

Large public companies are however expected to act in a risk neutral manner, similar to risk-averse individuals but not in a profit-neutral manner. Furthermore, in large, publicly held corporations, the shareholders do not make decisions about tax compliance directly instead their agents such as the chief financial officer or tax manager make such decisions (Slemrod, 2007). It is in the shareholders' interest for the agent responsible for tax compliance to reduce the company's effective tax burden, net of any costs of doing so, in order to maximise profit available to shareholders (Crocker & Slemrod, 2005).

Where the compliance decision rests in the hands of one or a few individuals, the decision may be reached sooner, though it is not any easier to reach a decision. There may be instances where organisations face a multiplicity of conflicting compliance pressures. In these instances, organisations are unlikely simply to comply and, rather, are likely to resort to compromise, avoidance, defiance, or manipulation in order to reach a position that is most favourable for the organisation (Pache & Santos, 2010).

A decision to comply with e-tolling may have wide reaching implications for the individuals concerned who made the decision. An individual's moral clarity is the extent to which they see behaviours in clear terms of right and wrong (Wiltermuth & Flynn, 2013). Making the incorrect decision, as determined by the organisation is likely to result in punishment for the individual. The individual may err on the side of caution in order to avoid punishment. The individual could suffer punishment should they have exposed the business to additional costs when the shareholders are of the opinion that the costs

could have been avoided. These costs refer to 'in the course of business costs' or risk associated costs and associated penalties, including legal fees.

The individual may consider the effects of reputational damage to the organisation in reaching a compliance decision. There always seems to be a good deal of distress expressed by those in authority each time the masses or a fraction thereof resolve to civil disobedience (Forji, 2010). Situations of dire injustice tend to enjoy more public sympathy today than during any other historical episode. This compassion has however not translated into any universal legal right of civil disobedience in the face of injustice (Forji, 2010). Shareholders have a duty to hold management to account for the moral consequences of the firm's activities on non-shareholding stakeholders (Mansell, 2013). Civil disobedience therefore cannot be a sufficient reason not to comply with relevant legislation.

Rational shareholders and managers will behave morally when long-term value creation is at the firms' core. The leadership of firms concerned with value creation make compliance a significant part, if not the core element of their overall strategy (Rossi, 2010). This approach comes with ethical maturity within the company, level of technical knowledge, and operational expertise at board level.

The traditional consensus is that the corporation is the evader of tax however; the real evader of tax is the agent of a corporation (Fukofuka, 2013). From the tax agency's point of view, penalties assessed on the agent instead of the corporation are a more effective tool against evasion because they exacerbate the conflict between the shareholders and the agent, resulting in what is a less efficient outcome for the two taken together (Rossi, 2010). The effectiveness of tax agency's policies depends on whether the corporation or the agent is penalized, and the extent to which the corporation can offset any penalty regime by restructuring its compensation contract with the agent.

2.3 Game theory

Game theory is the study of situations involving two or more decision makers such as individuals, organizations, or governments. Decision makers are designated as players. The players often have conflicting interests and make individual or collective decisions.

Simulations of games involving road tolling by local governments revealed that the best outcomes result from cooperation between government and users (Ubbels & Verhoef, 2008). Overcharging of tolls was found to be prevalent in all games where there is a large proportion of non-inhabitants making use of the road network. One method to mitigate this overcharging is by constraining the monopolistic power of the regional government by increasing the influence of central government. There needs to be balance though between the influence of central government and that of local government, as excessive power in the hands of central government is likely to lead to lower trust in central government (Barone & Mocetti, 2011).

When considering the spirit of the law, the letter of the law and the language of the law, the ethical interpretation is that companies should comply with the spirit of the law so that their tax payments can contribute toward social good (Dowling, 2014). Interpretations concerning the letter of the law and the language of the law involve exploiting loopholes, technicalities and complexity in order to reduce the tax burden. Sophisticated taxpayers are inclined to make profit-maximizing decisions, not necessarily ethical decisions. Nash equilibriums can be used to predict these decisions (Spraggon & Oxoby, 2009).

Game theory is useful to assess strategic decision making where taxpayer behaviour is unobservable from either field surveys or random audit studies (Bloomquist, 2011). The results of game theory simulations give insight into real-world phenomena.

In many games, there are multiple equilibria, and standard deductive equilibrium analysis is unable to determine which of these many possible equilibria the players will actually select. However, it is possible to argue that some Nash equilibria are implausible and will not be chosen (Alm & McKee, 2004).

The taxpayer's behaviour under uncertainty is assumed to conform to the Von Neumann-Morgenstern axioms, with income as the only input, and positive and strictly decreasing marginal utility, securing individual risk aversion (Ritsatos, 2014). In competitive markets where businesses increase their prices because of an additional cost, their competitors may increase their prices in response in order to maintain their profit margins. Where some businesses do not increase their prices, in order to increase market share or because they are not complying with the additional cost, those that increase their prices are likely to suffer.

Game theory simulations found that firms facing competitive pressures compete with one another in terms of in-house quality levels. Once quality levels have been brought to their lowest levels, firms engage in outsourcing production and distribution in terms of prices that they charge and their quality levels. The solution is to achieve an acceptable quality level and outsourced distribution to a point where costs are reduced and profits maximised (Nagurney & Li, 2015).

2.4 Conclusion

Current academic literature that was relevant to the field of tax morality was reviewed. Tax fairness provides the foundation for the discussion. The literature suggests that taxes that are seen to be fair are more likely to be complied with (Luttmer & Singhal, 2014). The majority of studies on the topic on tax fairness have been conducted on individuals.

The implementation of new regulations such as e-tolling, does not lead to rapid acceptance by members of society (Lopes, 2010). Trust in government leads to greater acceptance of new regulations. However, in order to build trust, citizens need reminding of the efficiency with which government spends their taxes. High levels of trust in government are associated with less complex regulation (Tammi, 2013). The complexities of the e-tolling system are well documented both by groups opposed to the system's implementation and from certain elements of government.

Tax fairness, the efficiency of public spending and trust in government are factors that affect compliance levels. The financial impact of the tax on companies is another important factor influencing compliance levels. The literature suggests that both large companies (Dowling, 2014) and smaller companies (Gangl et al. 2014; Kamleitner, Korunka, & Kirchler, 2012) may find opportunity to avoid paying taxes. Companies are not solely concerned with profit maximization; corporate social responsibility and responsible corporate citizenship (Bardy, Drew, & Kennedy, 2012) are factors of increasing importance, as society expects these behaviours.

The complexities of the tax system and additional administration costs that may arise may lead to changes in operating behaviour (Einbock, 2006). The choices facing individuals responsible for decision-making play an important role in compliance levels. Stakeholders' interests influence how decision-making individuals reach their decision (Crilly, Zollo, & Hansen, 2012). Exploring game theory provided insight into the possible actions of companies wanting to remain competitive while limiting the impact of tax. Compliance to taxation can be used to assess the importance of the factors mentioned in the literature.

The number of real world examples on companies limits the literature. Research is necessary in order to assess whether the literature applicable to individuals is also applicable to companies.

The constructs that emerge from this literature review and give rise to the hypotheses for testing in the next chapter are:

- tax fairness
- public spending efficiency
- financial impact
- compliance.

3 Hypotheses to be tested

In order to explore the impact that e-tolling is having on businesses, the research objectives and literature review is combined through the hypotheses below:

Hypothesis 1: The null hypothesis states that companies do not see e-tolling (ET) as fair. The alternative hypothesis is therefore that companies see e-tolling as fair.

H10: ET = 0

H1A: ET ≠ 0

Hypothesis 2: The null hypothesis states that companies see the spending on the GFIP as an efficient use of public funds (IPF). The alternative hypothesis is that companies see the spending on the GFIP as an inefficient use of public funds.

H20: IPF = 0

H2A: IPF ≠ 0

Hypothesis 3: The null hypothesis states that compliance with e-tolling is having a negative impact on company finances (CCF). The alternative hypothesis states that compliance is not having a negative impact on company finances.

H30: CCF < 0

H3A: CCF ≥ 0

Hypothesis 4: The null hypothesis states that companies are not complying with e-tolling (CET). The alternative hypothesis is that companies are complying with e-tolling.

H40: CET = 0

H4A: CET ≠ 0

4 Proposed research methodology and design

4.1 Suitability of methodology and design

This aim of this research was to gain a better understanding of the impact that e-tolling is having on businesses. This research made use of quantitative methods by obtaining primary data in the form of a survey. Data collected primarily for one's own research is primary data whereas data originally collected for another purpose is secondary data (Saunders & Lewis, 2012). Surveys are a structured collection of data from a sizeable population that may take the form of questionnaires, structured observations or interviews.

E-tolling is a relatively new regulation that came into effect on 3 December 2013 (Government Gazette, 2013), as such there is a lack of suitable secondary data that could be relied upon in order to test the stated hypotheses. This study was exploratory in nature focussing on seeking new insights into behaviour and compliance levels in businesses that are relevant to the research problem. As such, a questionnaire was the preferred data collection method for this research. This was a cross sectional study as data was obtained at a period in time.

4.2 Selection of sample frame

The Road Freight Association (RFA) is a voluntary membership body for companies in the road freight industry. Its members are mainly road freight service providers. The RFA is a body that aims to influence factors related to road freight for its members.

The RFA's member list is available on the RFA website to members. The list gives details of company name and contact telephone number, but not emails addresses or contact person name. The RFA list was obtained on 12 June 2015. The RFA was contacted, the details and purpose of the research explained, the membership list including email addresses and contact persons requested. After consideration, the RFA

declined to provide this level of detail however they were willing to send out the survey on two occasions to their members. This offer was not taken up, as it would have rendered almost no control over the data collection process of this research.

All the companies appearing on the RFA membership list of 12 June 2015 were contacted over the period 12 June 2015 to 23 July 2015 by telephone requesting the email address of the person in the organisation that would be best suited to complete the survey. Guidance was given to the companies contacted suggesting that the person best suited to answer the survey would be in a finance or operational position.

Of the 542 company names that appeared on the RFA list, 392 email addresses were obtained through the telephoning process. The remaining 150 either declined to provide email addresses, the companies no longer existed or the contact details were incorrect per the RFA list. Internet searches were conducted to obtain contact details for the companies where the telephone number appearing on the RFA list was incorrect.

A trained research assistant assisted in telephoning the companies and obtaining the email addresses. The assistant was instructed on whom to contact daily from the RFA list. This process was repeated until all the companies had been contacted, or confirmation was obtained through internet searches that they no longer existed. Instructions were given to the assistant of what guidance to give to the respondents and how to record the information obtained. The results of information obtained by the research assistant comprised the final list of 392 email addresses that were surveyed.

4.3 Choice of methodology

Quantitative research generates statistics through the use of large-scale survey research, using methods such as questionnaires or structured interviews (Dawson, 2007). A survey was the most appropriate quantitative method of gathering information in order to test the stated hypotheses. Surveys were used in order to gather information from numerous sources for analysis. The intention was to gather information from a wide spread of businesses affected by e-tolling so as to obtain representative results.

There was a lack of suitable secondary info available for analysis. Secondary data that was available lacked academic credibility as it came mainly in the form of website articles that were not peer reviewed. Such data seems biased either in favour of, or against the concept of e-tolling and hence was not be relied upon for the purposes of this study.

Listed companies, such as Shoprite, that have made statements concerning their compliance with e-tolling could be tested providing such information was specifically highlighted in their published results (Businesstech, 2014), however similar statements cannot be tested for non-listed entities due the confidentiality of their annual results' publication. The lack of suitable secondary data pointed this research firmly to the direction of obtaining primary data.

4.4 Population

The universe for this research was all road users. The population consisted of all businesses that have used the tolled freeways, since the introduction of e-tolling. A business was broadly defined as any organisation that ran operations both for profit and non-profit, though not necessarily only those with separate legal liability.

According to Saunders & Lewis (2012) a sampling frame is the complete list of all members of the population. It was not possible to establish a sample frame for this research due to a lack of a complete list of the population. The RFA is a membership body for businesses that are involved in road haulage in South Africa. It was considered relevant to this study and is therefore selected as the population as these businesses are in the road freight industry and were most likely to be impacted by the introduction of e-tolling.

4.5 Unit of analysis

The unit of analysis was businesses that make use of the tolled freeways.

4.6 Sampling method and size

The research focused on all businesses that make use of the tolled freeways. It would have been ideal to survey all businesses that make use of the freeways, though for lack of such a comprehensive list, all members of the population were included irrespective of their fleet size.

The exact size of the sample was not determined, as the exact number comprising the population could not be determined, though the sample selected was expected to return at least 30 positive responses so that the results of survey can approximate a normal distribution. All participants in the RFA population were selected for survey. A limited number of foreign registered hauliers may be members of the RFA. They were included for the purposes of sampling, as their membership of the RFA directly implies that they make use of South African freeways.

4.7 Survey testing

A test survey was distributed to five individuals in order to assess whether the questions are clear, understandable and whether the participants are able to answer without unintended complication. Feedback from the individuals was incorporated into the survey prior to distributing to the survey to the target audience.

4.8 Data gathering process

Ethical clearance was sought and obtained from the University of Pretoria prior to gathering any data. This research made use of non-probability sampling. Each member of the RFA had the same probability of being selected for survey.

The RFA list of members is available to members on the RFA website. The list consists of company names and contact phone numbers. Each of the companies on the RFA list was contacted to obtain their email addresses for the purposes of surveying. Only

companies willing to participate by providing their email address were surveyed. All of the companies willing to participate were surveyed.

The data was analysed from responses received from an electronic survey. The survey consisted of 20 questions designed to test the hypotheses in the form of a Likert scale. The survey was in the form of an anonymous electronic format that participants were required to submit electronically upon completion. Appendix 2: Final Questionnaire shows the final list of questions that comprised the questionnaire. The participants were emailed a link to the survey on SurveyMonkey.

4.9 Significance level

The significance level for data analysis was set at 95%. This is considered a sufficiently stringent threshold for hypothesis testing. Using this significance level, P values that were smaller than 0,05 would not be rejected.

4.10 Reliability

Cronbach's alpha (CA) is commonly used for multiple Likert questions in a survey that form a scale and one wishes to determine if the scale is reliable. It is used to test the internal consistency or average correlation of items in the survey instrument to gauge its reliability, with a score in exceeding 0,65 indicating a high level of reliability (Santos, 1999).

4.11 Factor analysis

Principal component analysis (PCA) is a variable reduction technique of factor analysis used to reduce a larger set of variables into a smaller set of 'artificial' variables, called 'principal components', which account for most of the variance in the original variables (Laerd Statistics, 2015). Factor analysis was used to reduce the number of questions

into fewer constructs. These constructs were used for the purposes of analysing the results of the information from the questionnaire. Kaiser-Meyer-Olkin (KMO) is a measure of sampling adequacy, with a number greater than 0,6 being acceptable. Bartlett's test of sphericity compares the observed correlation matrix to the identity matrix. It is a check of whether the variables can be summarised into fewer factors. Eigenvalues give an indication of how many factors to retain (Laerd Statistics, 2015).

4.12 Analysis approach

Descriptive statistics were used at an entry level to aid the researcher in gaining an understanding of the data. The mean described the central tendency of the data while the standard deviation described the dispersion of the data around the mean (Norusis, 2005). Skewness measures the symmetry of a distribution compared to a normal distribution (Hair, Black , Babin, Anderson, & Tatham, 2006).

In testing the hypotheses, statistical inference for all hypotheses was made using chi-square tests. The chi-square test is applied when there are categorical variables from a single population. The test is used to determine whether there is a significant association between the two variables. It is a nonparametric statistical analysing method often used in experimental work where the data consist in frequencies or `counts' (Laerd Statistics, 2015).

4.13 Limitations

There are various limitations inherent in this research.

- The limited population meant that only a fraction of the total number of road users was surveyed.
- The survey depended on the accuracy of the membership list of the RFA. Any inaccuracies would be included as part of the population and may have resulted in a no-response hence decreasing the response rate achieved.

- Membership to the RFA requires annual payment relative to the fleet size, types of vehicles used, number of axles and tires that an operator declares. Although membership is voluntary, it is not free. Numerous businesses that are relevant to this research did not form part of the sampling process, due to their non-membership of the RFA.
- Members of the RFA may display bias in terms of complying with e-tolling. This may be due to their voluntary membership of the RFA, which has a financial impact.
- The results of this research were limited to the respondents from the RFA and hence inferences across all businesses or road users could not be made.
- The timing of this research did not allow information to be gathered for an extended period of time to allow for time-series analysis. This may have impacted the results of the questions concerning changes to compliance levels over time.
- The number of questions asked limited the statistical tests that could be performed with the data.
- The survey may have suffered the same fate as the surveys referred to by Anderson & Simester (2013), in that respondents may have been less than fully truthful with their responses. Cronbach's alpha test of internal reliability tested whether this was prevalent.
- This research was not intended to offer a solution as to the most appropriate funding method or to the best method of collection.

5 Results

5.1 Survey testing

The initial survey was compiled after completion of the literature review. This survey was tested on five individuals working in the transport industry. One of the persons selected to provide feedback on the questionnaire appeared on the RFA list. Feedback from two of the individuals was that they understood the questionnaire fully and could answer all the questions without needing to suggest any improvements. This feedback did not bring anything additional to testing process and was largely ignored. The three other participants however provided relevant feedback on the test survey that appears in Appendix 1: Test Questionnaire that highlighted the following shortcomings:

- The seven-option Likert scale on the questionnaire allowed for too many response options, contributing towards response fatigue.
- There was no measurement of the financial impact of e-tolling.
- Question 4 was irrelevant to the research, as it was testing public fairness, whereas the research was focussed on business.
- Question 9 did not allow for respondents that are paying their account but that also did not have e-tags.
- Question 14 was irrelevant as the ability to pay was not being tested.
- Questions 18 and 19 implied that the respondent came from a position of non-compliance, as they did not allow for respondents that were already in a position of compliance.

Changes were made to the survey taking into account the feedback received and in order to closer align the questions with the hypotheses being tested. The final survey that was distributed appears in Appendix 2.

5.2 Selection of questions for questionnaire

The questions used in the test survey and final survey were compiled after the establishment of the hypotheses to be tested. There was no reference made to prior questionnaires on similar topics in compiling the questions.

5.3 Response rate

The survey was emailed to the participants on 21 July 2015. Four reminders were sent by email and all participants were telephoned three times to request that they complete the survey. The survey closed on 8 August 2015. Positive responses were received from 70 participants of the 397 surveys that were sent out. An additional two responses to the survey were received by email stating that they could not undertake the survey due to the survey not being conducted by a government body and that the responded felt uncomfortable sharing confidential information respectively. As these two responses did not provide Likert scale information required for data analysis, they were excluded from the data analysis. The response rate achieved was 18%.

5.4 Recoding of data

The responses per the questionnaire were nominal. To convert the responses to scale and ordinal variables and allow for analysis using IBM SPSS Statistics 23 (SPSS), the questionnaire responses were recoded as shown in Table 1.

Questions 1, 2 and 3 were included in the questionnaire in order to provide a basis for comparisons on the data collected. Questions 4 to 20 comprised the Likert scale questions.

Table 1: Recoding of all questions

Questions 1 & 2		Question 3		Questions 4 - 20	
Option	Recoded	Option	Recoded	Option	Recoded
0	0	R 0	0	Strongly disagree	1
1-50	1	R1 - R1000	1	Disagree	2
51-100	2	R1,001 - R5,000	2	Neutral	3
101-250	3	R5,001 - R10,000	3	Agree	4
251-500	4	R10,001 - R100,000	4	Strongly agree	5
501-1000	5	Above R100,000	5		
More than 1000	6	Unsure	6		

5.5 Reliability

Cronbach's alpha (CA) was calculated using SPSS across questions 4 to 20 that requested responses in the form of the Likert scale. CA was calculated per construct tested. Four constructs were tested in the questionnaire.

1. Fairness construct comprised questions 4 to 7
2. Efficiency construct comprised questions 8 to 12
3. Financial Impact construct comprised questions 13 to 16
4. Compliance construct comprised questions 17 to 20.

In order to obtain meaningful CA results, questions 4, 6, 8 and 12 were recoded negatively with results of the Likert scale reversed prior to analysis.

5.5.1 Reliability of Fairness construct

CA of 0,631 resulted from the four questions comprising the Fairness construct. The CA improved to a reliable measure of 0,659 per Table 2 by the elimination of question 5, 'E-tolling is a form of tax'.

Table 2: Cronbach's alpha on construct 1 Fairness

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.631	0.646	4
0.659	0.665	3

5.5.2 Reliability of Efficiency construct

CA of 0,612 resulted from questions 8 to 12 that comprised the Efficiency construct. This was improved to 0,620 by elimination of question 8 per Table 3. CA could not be improved by further elimination of questions.

Table 3: Cronbach's alpha on construct 2 Efficiency

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.612	0.609	5
0.620	0.619	4

5.5.3 Reliability of Financial Impact construct

CA of 0,846 resulted from questions 13 to 16 that measured the Financial Impact construct per Table 4. This result achieved reliability as CA > 0,65 using all 4 questions.

Table 4: Cronbach's alpha on construct 3 Financial Impact

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.846	0.852	4

5.5.4 Reliability of Compliance construct

CA of 0,712 resulted from questions 17 to 20 that measured the Compliance construct per Table 5. This result achieved reliability as CA > 0,65 by using all 4 questions.

Table 5: Cronbach's alpha on construct 4 Compliance

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.712	0.697	4

5.6 Factor analysis

5.6.1 Factor analysis of Fairness construct

All variables of questions 4 to 7 comprising the Fairness construct had at least one correlation above 0,3 per Appendix 3: Correlation matrix for Fairness construct. The results of the KMO and Bartlett's test of sphericity on the Fairness construct are displayed in Table 6. The KMO measure of sampling adequacy was 0,635, which is acceptable for the purposes of factor analysis. Bartlett's test of sphericity showed $P < 0,05$ indicating that PCA was suitable for use on the construct.

Table 6: KMO and Bartlett's test on Fairness construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.635
Bartlett's Test of Sphericity	Approx. Chi-Square	43.620
	df	6
	Sig.	**0.000

** Significance at 0,05 level

One component was extracted based on the Eigenvalue 1 rule representing 49,376% of the variance per Table 7. This component was labelled Fairness1.

Table 7: Number of components and total variance explained of Fairness construct

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.975	49.376	49.376	1.975	49.376	49.376
2	0.864	21.599	70.975			
3	0.759	18.974	89.949			
4	0.402	10.051	100.000			

5.6.2 Factor analysis of Efficiency construct

Factor analysis was performed on questions 8 to 12 comprising the Efficiency construct. The results of the correlation matrix showed that question 12 'Our business has not changed our driving routes because of e-tolling' had no correlations above 0,3 per Appendix 4: Correlation matrix for Efficiency construct. The results of the KMO and Bartlett's test of sphericity on the Efficiency construct are shown in Table 8. The KMO measure of sampling adequacy at 0,644 was acceptable for the purposes of factor analysis. Bartlett's test of sphericity showed $P < 0,05$ indicating that PCA was suitable for use on the construct. Elimination of question 12 with below 0,3 correlations resulted in an unreliable KMO of 0,569 hence the variable was not eliminated.

Table 8: KMO and Bartlett's test on Efficiency construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.644
Bartlett's Test of Sphericity	Approx. Chi-Square	36.891
	df	10
	Sig.	**0.000

** Significance at 0,05 level

Two components were extracted based on the Eigenvalue 1 rule representing 61,755% of the variance per Table 9. Questions 9, 10 and 11 were grouped together to form a component labelled EfficiencyImpact1, and questions 8 and 12 were grouped together to form a component labelled UpgradesRouteChange2. The questions were grouped according to their highest loadings per Appendix 5: Rotated Component Matrix for Efficiency construct. The EfficiencyImpact1 component accounted for 32% of the variance and UpgradesRouteChange2 component accounted for 29% of the variance as reflected in Table 9.

Table 9: Number of components and total variance explained of Efficiency construct

Total Variance Explained									
	Initial Eigenvalues			Extraction Sums of Squared			Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		% of Variance	Cumulative %
1	1.983	39.660	39.660	1.983	39.660	39.660	1.617	32.349	32.349
2	1.105	22.095	61.755	1.105	22.095	61.755	1.470	29.406	61.755
3	0.783	15.650	77.406						
4	0.610	12.201	89.606						
5	0.520	10.394	100.000						

5.6.3 Factor analysis of Financial Impact construct

Questions 13 to 16 comprised the Financial Impact construct. The correlation matrix showed that all variables had correlations above 0,3 per Appendix 6: Correlation matrix for Financial Impact construct. The KMO measure of sampling adequacy was 0,786, which was acceptable for the purposes of factor analysis. Bartlett's test of sphericity showed $P < 0,05$ indicating that PCA was suitable for use on the construct. The results of the KMO and Bartlett's test of sphericity on the Financial Impact construct are shown in Table 10.

Table 10: KMO and Bartlett's test on Financial Impact construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.786
Bartlett's Test of Sphericity	Approx. Chi-Square	125.150
	df	6
	Sig.	**0.000

** Significance at 0,05 level

One component was extracted based on the Eigenvalue 1 rule representing 69,685% of the variance per Table 11. This component was labelled the CoFinances1.

Table 11: Number of components and total variance explained of Financial Impact construct

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.787	69.685	69.685	2.787	69.685	69.685
2	0.629	15.713	85.399			
3	0.342	8.541	93.939			
4	0.242	6.061	100.000			

5.6.4 Factor analysis of Compliance construct

Factor analysis was run on questions 17 to 20 comprising the Compliance construct. The results of the correlation matrix showed that question 20, 'The consequences for non-payment of e-tolls is a major factor influencing our business decision to comply / not comply', had correlations below 0,3 per Appendix 7: Correlation matrix for Compliance construct. The elimination of question 20 resulted in the KMO measure of sampling adequacy of 0,60 which was acceptable for the purposes of factor analysis. Bartlett's test of sphericity showed $P < 0,05$ indicating that PCA was suitable for use on the construct. The results of the KMO and Bartlett's test of sphericity on the Compliance construct are shown in Table 12.

Table 12: KMO and Bartlett's test on Compliance construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.60
Bartlett's Test of Sphericity	Approx. Chi-Square	123.795
	df	3
	Sig.	**0.000

** Significance at 0,05 level

One component was extracted based on the Eigenvalue 1 rule representing 73,453% of the variance per Table 13. This component was labelled the Compliance1 component. Total variance explained was 56,307% when question 20 was included, hence the variable was eliminated.

Table 13: Number of components and total variance explained of Compliance construct

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.204	73.453	73.453	2.204	73.453	73.453
2	0.699	23.311	96.764			
3	0.097	3.236	100.000			

5.7 Results of individual questions

Questions 1, 2 and 3 were analysed individually. The remaining questions were analysed as grouped components according to factor analysis.

5.7.1 Questions relating to fleet size

The first three questions from the questionnaire were asked to establish scale reference points for cross tabulations against the constructs.

5.7.2 Question 1: How many vehicles are there in your business' fleet?

The first question in the survey was asked to establish the fleet size of the respondent, as this information was absent from the RFA database. The question was used as a reference point for cross tabulations later in the analysis to determine whether there was

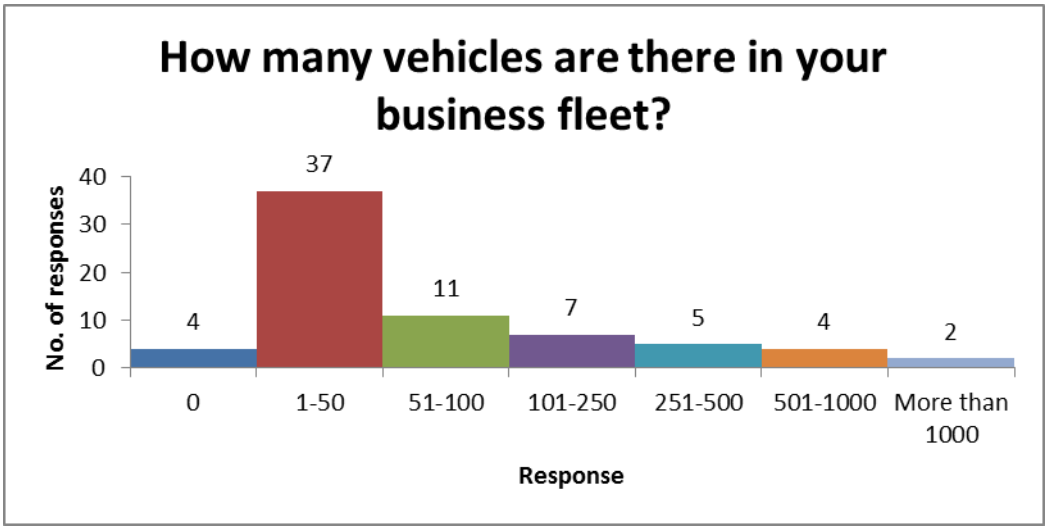
significance across other questions relative to fleet size. The mean was 1,89 and standard deviation was 1,470.

Table 14: Question 1: Frequency table: How many vehicles are there in your business fleet?

How many vehicles are there in your business fleet?			
Response	Frequency	Percent	Cumulative Percent
0	4	5.7	5.7
1 - 50	37	52.9	58.6
51 - 100	11	15.7	74.3
101 - 250	7	10.0	84.3
251 - 500	5	7.1	91.4
501 - 1000	4	5.7	97.1
More than 1000	2	2.9	100.0
Total	70	100.0	

As is evidenced from Table 14 and from the mean of 1,89, most of the respondents had fleet sized between one and 100 vehicles. There were six respondents with fleet sizes exceeding 500, which is an extremely large fleet in South Africa. Taking the mid points of each of the categories and multiplying by the frequency of responses results in the responses covering 10,350 vehicles.

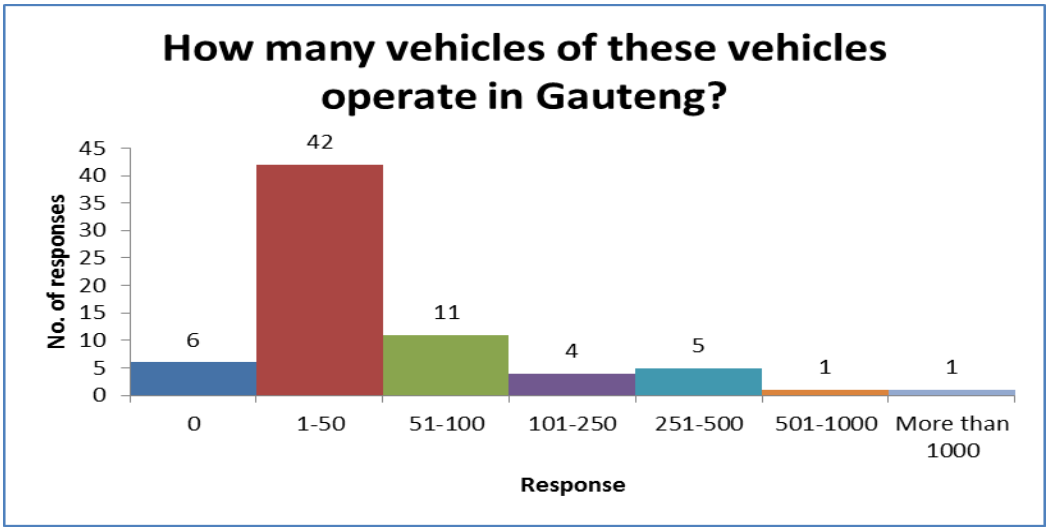
Figure 1: Question 1: Histogram: How many vehicles are there in your business fleet?



5.7.3 Question 2: How many of these vehicles operate in Gauteng?

The second question quantified the number of the respondents' vehicles that operated in Gauteng. The RFA is a national organisation hence one could not assume that all of the respondents operated their businesses in Gauteng. This question was asked as some RFA respondents' vehicles may operate outside of Gauteng and may therefore not be affected by e-tolling. The correlation between questions 1 and 2 was 0,878. The relationship between the two questions was significant as $p < 0,05$ per Appendix 8: Correlations between questions 1 and 2. The dispersion of this question is positively skewed per Figure 2.

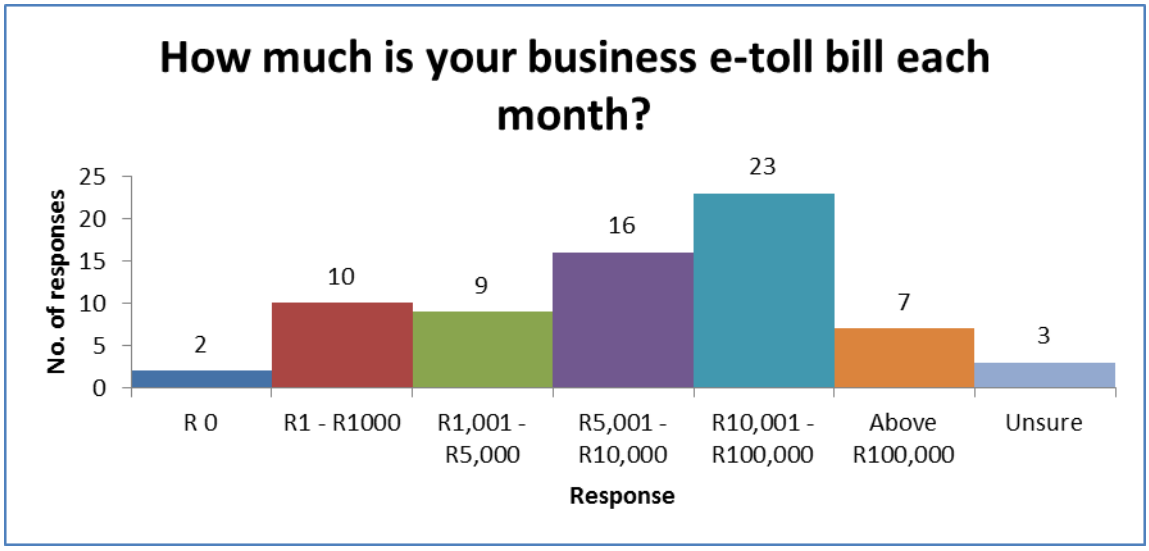
Figure 2: Question 2: Histogram: How many of these vehicles operate in Gauteng?



5.7.4 Question 3: How much is your business e-toll bill each month?

Question 3 was asked in order to measure the financial impact of e-tolling on businesses. The mean of this question was 3,16 indicating that the average e-toll bill per month for the respondents was slightly over R10,000 per month. The correlation between questions 2 & 3 was 0,571 and between questions 1 & 3 was 0,615 per Appendix 8: Correlations between questions 1 and 2 and Appendix 9: Correlations between questions 1 & 3 and 2 & 3 respectively. The correlations were significant as $p < 0,05$ in both cases.

Figure 3: Question 3: Histogram: How much is your business e-toll bill each month?



5.8 Results from hypothesis testing

5.8.1 Hypothesis 1: The null hypothesis states that companies do not see e-tolling (ET) as fair

Questions 4 to 7 of the questionnaire tested the fairness of e-tolling. These questions were combined according to the factor analysis to form the Fairness1 construct. The mean result of the four questions was calculated in SPSS after coding the questions negatively. The results of combining the four questions are shown in Table 15 after rounding the response to the nearest integer to allow the results to be analysed according to the Likert scale of the questionnaire. The results are shown graphically in Figure 4.

Table 15: Fairness1: Frequency table

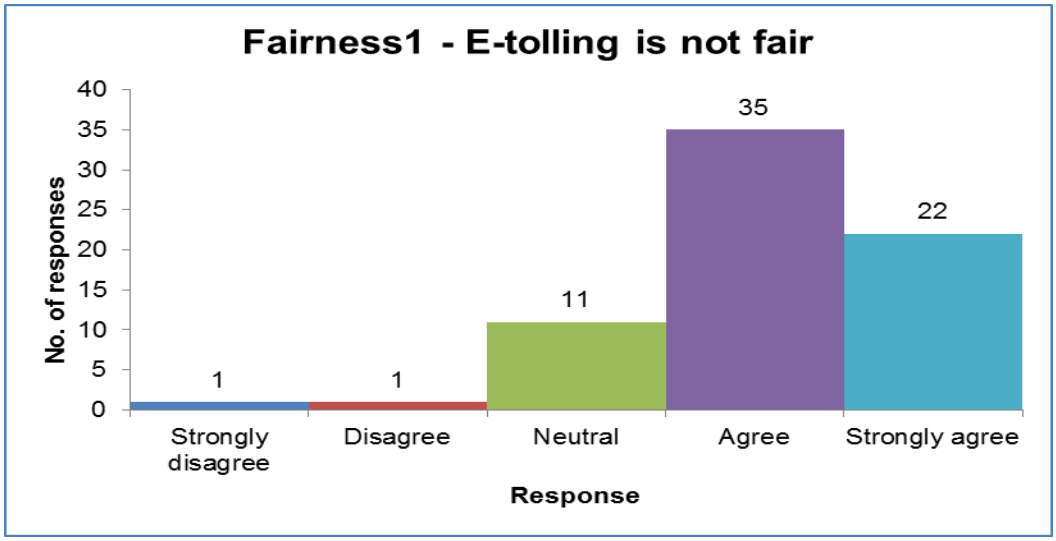
Fairness1: E-tolling is not fair				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1.0	1.4	1.4	1.4
Disagree	1.0	1.4	1.4	2.9
Neutral	11.0	15.7	15.7	18.6
Agree	35.0	50.0	50.0	68.6
Strongly agree	22.0	31.4	31.4	100.0
Total	70.0	100.0	100	

Of the responses, 81% either agreed or strongly agreed with the statement that e-tolling was not fair. The mean and median were both slightly stronger than agree, with the mode also being agree. The standard deviation was 0,812 indicating the strength of the dispersion around the agree category. The Fairness1 construct shows strong negative skewness of -0,996.

Table 16: Fairness1: Descriptive statistics

Fairness1	
Mean	4.086
Median	4.158
Mode	4.000
Std. Deviation	0.812
Skewness	-0.996

Figure 4: Fairness1: Histogram



Cross tabulations were run against the Fairness1 construct and question 3, 'How much is your business e-toll bill each month?'. The results of the cross tabulation are in Table 17. The results of the chi-square test in Table 18 show that there is a significant relationship between the construct and the amount of the e-toll bill each month as $p < 0,05$. Crosstabs were run against the construct and questions 1 and 2 measuring fleet size. Question 2 relating to fleet size in Gauteng showed an improved chi-square result compared to question 1 however none were statistically significant as $p = 0,84$ and $p = 0,80$ as per Appendix 10: Chi-Square test of Fairness1: vs. How many vehicles are there in your business fleet? and Appendix 11: Chi-Square test of Fairness1: vs. How many of these vehicles operate in Gauteng? respectively.

The result was do not reject the null hypothesis as companies do not see e-tolling as fair.

Table 17: Crosstab of Fairness1: E-tolling is not fair vs. How much is your business e-toll bill each month?

Fairness1 * How much is your business' e-toll bill each month? Crosstabulation									
Fairness1: E-tolling is not fair	How much is your business e-toll bill each month?								
	Response	0	R1 - R1000	R1,001 - R5,000	R5,001 - R10,000	R10,001 - R100,000	Above R100,000	Unsure	Total
	Strongly disagree	0	1	0	0	0	0	0	1
	Disagree	0	1	0	0	0	0	0	1
	Neutral	2	1	0	1	5	0	2	11
	Agree	0	6	5	7	11	6	0	35
	Strongly agree	0	1	4	8	7	1	1	22
	Total	2	10	9	16	23	7	3	70

Table 18: Chi-Square test of Fairness1: E-tolling is not fair vs. How much is your business e-toll

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	39.847	24	**0.022
Likelihood Ratio	34.328	24	0.079
Linear-by-Linear Association	1.539	1	0.215
N of Valid Cases	70		

** Significance at 0,05 level

5.8.2 Hypothesis 2: The null hypothesis states that companies see the spending on the GFIP as an efficient use of public funds (IPF)

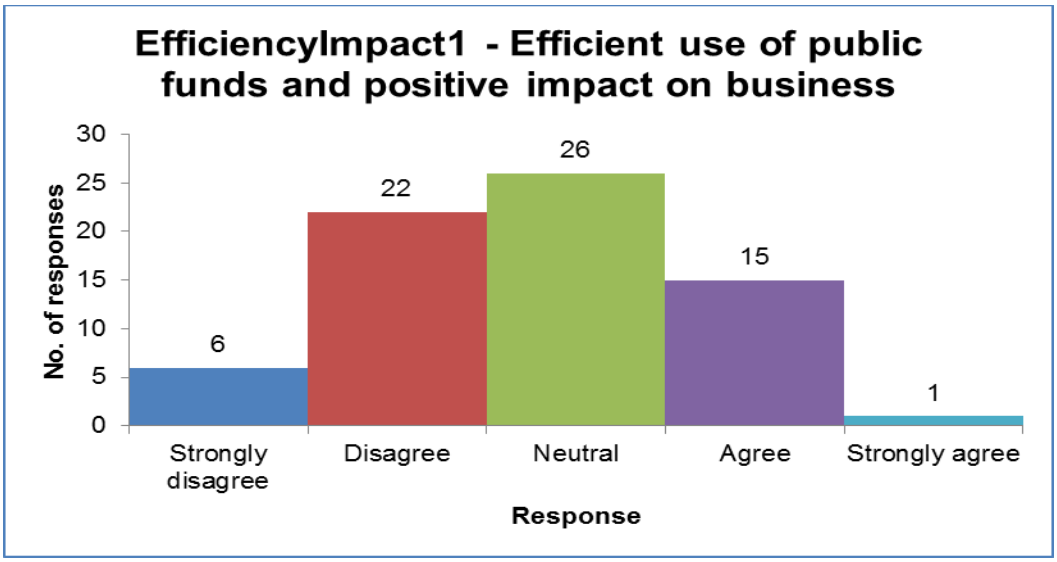
5.8.2.1 EfficiencyImpact1 component

The first component extracted from the Efficiency construct was the EffieicncyImpact1 component. This component consisted of the means of questions 9, 10 and 11 after coding the questions positively. The results of the new component were rounded to allow for analysis according to the Likert scale of the questionnaire. From the descriptive statistics shown in Table 19, the mean and median are slightly greater than disagree. The distribution is close to being normal from the skewness of -0,030 in Table 19. From Figure 5, 28 of the respondents or 40% strongly disagreed or disagreed that the upgraded freeways was and efficient use of public funds and that they are having a positive impact on business, compared to 16 or 23% that agreed or strongly agreed. 37% of respondents were neutral. Opinion was therefore spread on this component.

Table 19: EfficiencyImpact1: Descriptive statistics

EfficiencyImpact1	
Mean	2.757
Median	2.750
Mode	3.000
Std. Deviation	0.939
Skewness	-0.030

Figure 5: EfficiencyImpact1: Histogram



The results of the EfficiencyImpact1 component were cross tabulated against question 3 'How much is your e-toll bill each month?' as shown in Table 20. The results of the chi-square tests showed that there was significance between the variables as $p < 0,05$ from Table 21.

Table 20: Crosstab of EfficiencyImpact1: vs. How much is your business e-toll bill each month?

EfficiencyImpact1 * How many vehicles are there in your business fleet? Crosstabulation								
EfficiencyImpact1 : Efficient use of public fundsand positive impact on business	How many vehicles are there in your business fleet?							
Response	0	1-50	51-100	101-250	251-500	501-1000	More than 1000	Total
Strongly disagree	1	3	0	1	1	0	0	6
Disagree	0	12	5	1	0	3	1	22
Neutral	1	17	2	4	1	0	1	26
Agree	1	5	4	1	3	1	0	15
Strongly agree	1	0	0	0	0	0	0	1
Total	4	37	11	7	5	4	2	70

Table 21: Chi-Square test of EfficiencyImpact1: vs. How much is your business e-toll bill each month?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	38.134[a]	24	**0.034
Likelihood Ratio	31.252	24	0.147
Linear-by-Linear Association	0.007	1	0.934
N of Valid Cases	70		

** Significance at 0,05 level

5.8.2.2 UpgradeRouteChange2 component

The second component extracted from the Efficiency construct was the UpgradeRouteChange2 component. This component comprised of questions 8 and 12. The means of the new component were rounded to allow for analysis according to the Likert scale of the questionnaire. The mean and median of the component was close to agree per Table 22. The results showed skewness of -0,615 as can also be seen in Figure 6.

Table 22: UpgradeRouteChange2: Descriptive statistics

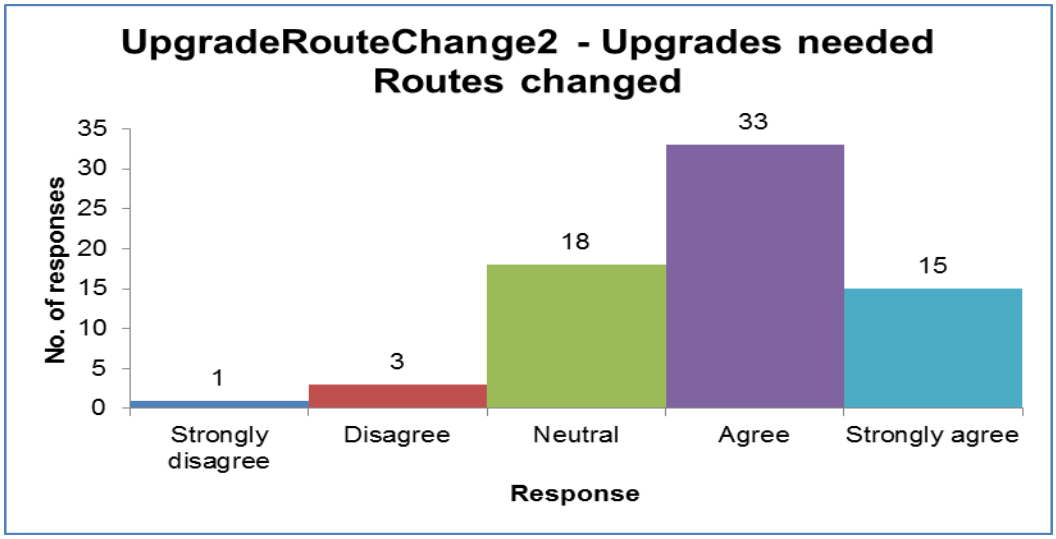
UpgradeRouteChange2	
Mean	3.829
Median	3.860
Mode	4.000
Std. Deviation	0.868
Skewness	-0.615

Table 23: UpgradeRouteChange2: Frequency table

UpgradeRouteChange2: Upgrades needed Routes changed				
	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly disagree	1.0	1.4	1.4	1.4
Disagree	3.0	4.3	4.3	5.7
Neutral	18.0	25.7	25.7	31.4
Agree	33.0	47.1	47.1	78.6
Strongly agree	15.0	21.4	21.4	100.0
Total	70.0	100.0	100	

The frequency table in Table 23 shows that 68% of respondents agreed or strongly agreed that upgrades were required to the Gauteng freeways and that their business driving routes changed because of e-tolling. Only 6% disagreed or strongly disagreed with 26% remaining neutral.

Figure 6: UpgradeRouteChange2: Histogram



The UpgradeRouteChange2 component was compared to question 3 'How much is your business e-toll bill each month?' using cross tabulations shown in Table 24. The results of the chi-square test in Table 25 did not show significance between the variables, as $p > 0,05$. Cross tabulations, testing the component against question 1 'How many vehicles are there in your business fleet?' and question 2 'How many of these vehicles operate in Gauteng?' similarly did not show significance between the variables as per Appendix 12: Chi-Square tests on UpgradeRouteChange2 component.

Table 24: Crosstab of UpgradeRouteChange2: vs. How much is your business e-toll bill each month?

UpgradeRouteChange2 * How much is your business e-toll bill each month? Crosstabulation									
	How much is your business e-toll bill each month?								
	Response	0	R1 - R1000	R1,001 - R5,000	R5,001 - R10,000	R10,001 - R100,000	Above R100,000	Unsure	
UpgradeRouteChange2: Upgrades needed Routes changed	Strongly disagree	0	1	0	0	0	0	0	1
	Disagree	1	0	0	1	1	0	0	3
	Neutral	0	2	1	4	11	0	0	18
	Agree	1	5	5	6	9	4	3	33
	Strongly agree	0	2	3	5	2	3	0	15
	Total	2	10	9	16	23	7	3	70

Table 25: Chi-Square test of UpgradeRouteChange2: vs. How much is your business e-toll bill each month?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.823	24	0.088
Likelihood Ratio	29.330	24	0.208
Linear-by-Linear Association	0.440	1	0.507
N of Valid Cases	70		

5.8.2.3 Summarised results from Efficiency1 and UpgradeRouteChange2 components

Component 1 showed significance when compared to amount of the respondents' e-toll bill however, the distribution was close to being normal. The results of component 1 are insufficient to conclude that businesses see the upgrading of the Gauteng freeways as an efficient use of public funds.

The analysis of component 2 showed strong negative skewness. There was no significant relationship between the component to questions 1, 2 or 3.

The result is to reject the null hypothesis due to insufficient evidence to support it.

5.8.3 Hypothesis 3: The null hypothesis states that compliance with e-tolling is having a negative impact on company finances (CCF).

The CoFinances1 component comprised questions 13 to 16 according to the factor analysis performed. The construct measured the negative impact of e-tolling on company finances. The results of constructing the component from the four questions were rounded in order to eliminate decimals and to allow for analysis according to the Likert scale of the questionnaire. Figure 7 shows the histogram of the mean responses of the four questions comprising the construct. The results are shown graphically in Figure 7. 74% of the respondents agreed or strongly agreed that e-tolling was having a negative impact on company finances. Only 6% disagreed or strongly disagreed that e-tolling was having a negative impact on company finances. Cross tabulations comparing the construct CoFinances1 were run against question 1 as shown in Table 26.

Figure 7: CoFinances1: Histogram

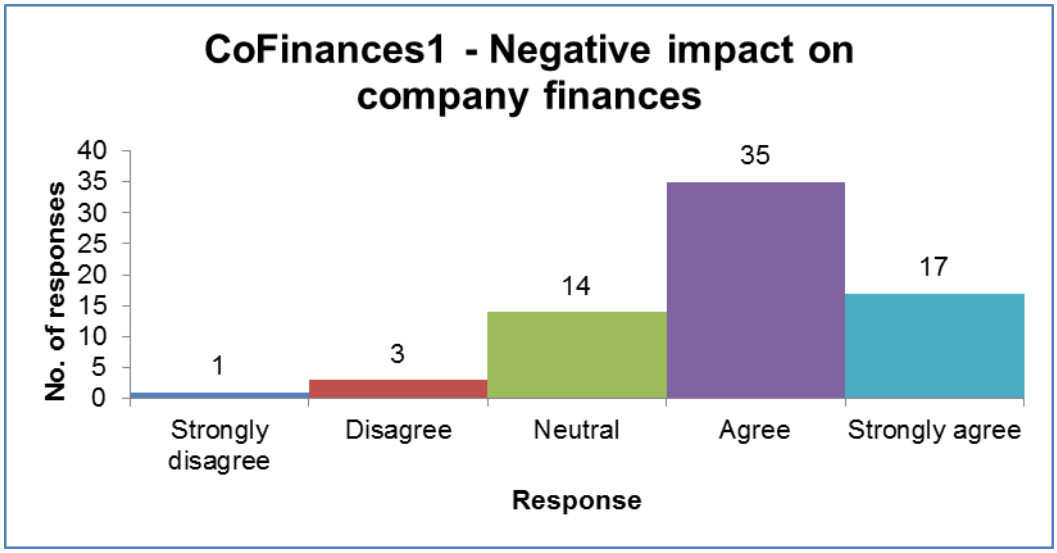


Table 26: Crosstab of CoFinances1: vs. How many vehicles are there in your business fleet?

CoFinances1 * How many vehicles are there in your business' fleet? Crosstabulation									
CoFinances1: E-tolling is having a negative impact on company finances	How many vehicles are there in your business fleet?								
	Response	0	1-50	51-100	101-250	251-500	501-1000	More than 1000	Total
	Strongly disagree	1	0	0	0	0	0	0	1
	Disagree	1	1	0	0	1	0	0	3
	Neutral	0	3	3	4	1	3	0	14
	Agree	0	22	6	3	2	1	1	35
	Strongly agree	2	11	2	0	1	0	1	17
	Total	4	37	11	7	5	4	2	70

The results of the chi-square test in Table 27 show that there is a significant relationship between the construct and the amount of the e-toll bill each month as $p < 0,05$. Crosstabs were run against the CoFinances1 construct and questions 2 and 3 measuring fleet size operating in Gauteng and the how much the business e-toll bill is each month respectively. In both cases there was significant relationship between the variables tested as shown by the chi-square tests in Table 29 and Table 31. The results of the cross tabulations are shown in Table 28 and Table 30.

The result was do not reject the null hypothesis as e-tolling is having a negative impact on company finances.

Table 27: Chi-Square test of CoFinances1: vs. How many vehicles are there in your business fleet?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	47.959	24	**0.003
Likelihood Ratio	36.884	24	0.045
Linear-by-Linear Association	1.707	1	0.191
N of Valid Cases	70		

** Significance at 0,05 level

Table 28: Crosstab of CoFinances1: vs. How much is your business e-toll bill?

CoFinances1 * How much is your business' e-toll bill each month? Crosstabulation								
CoFinances1: E-tolling is having a negative impact on company finances	How much is your business' e-toll bill each month?							
Response	0	R1 - R1000	R1,001 - R5,000	R5,001 - R10,000	R10,001 - R100,000	Above R100,000	Unsure	Total
Strongly disagree	0	1	0	0	0	0	0	1
Disagree	0	2	0	0	0	1	0	3
Neutral	1	2	0	1	7	0	3	14
Agree	1	1	5	11	14	3	0	35
Strongly agree	0	4	4	4	2	3	0	17
Total	2	10	9	16	23	7	3	70

Table 29: Chi-Square test of CoFinances1: vs. How much is your business e-toll bill each month?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	45.663[a]	24	**0.005
Likelihood Ratio	45.284	24	0.005
Linear-by-Linear Association	0.040	1	0.842
N of Valid Cases	70		

** Significance at 0,05 level

Table 30: Crosstab of CoFinances1: vs. How many vehicles operate in Gauteng?

CoFinances1 * How many of these vehicles operate in Gauteng? Crosstabulation								
CoFinances1: E-tolling is having a negative impact on company finances	How many of these vehicles operate in Gauteng?							
Response	0	1-50	51-100	101-250	251-500	501-1000	More than 1000	Total
Strongly disagree	1	0	0	0	0	0	0	1
Disagree	1	1	0	0	1	0	0	3
Neutral	2	4	6	0	2	0	0	14
Agree	0	24	5	4	1	0	1	35
Strongly agree	2	13	0	0	1	1	0	17
Total	6	42	11	4	5	1	1	70

Table 31: Chi-Square test of CoFinances1: vs. How many vehicles operate in Gauteng?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	43.008[a]	24	**0.010
Likelihood Ratio	41.026	24	0.017
Linear-by-Linear Association	0.108	1	0.743
N of Valid Cases	70		

** Significance at 0,05 level

5.8.4 Hypothesis 4: The null hypothesis states that companies are not complying with e-tolling (CET).

The Compliance1 construct comprised questions 17 to 20. The construct measured whether companies are complying with e-tolling. The results of constructing the construct from the four questions were rounded in order to eliminate decimals and to allow for analysis according to the Likert scale of the questionnaire. Table 32 shows the descriptive statistics. The mean is close to agree with the mode of agree.

Figure 8: Compliance1: Histogram

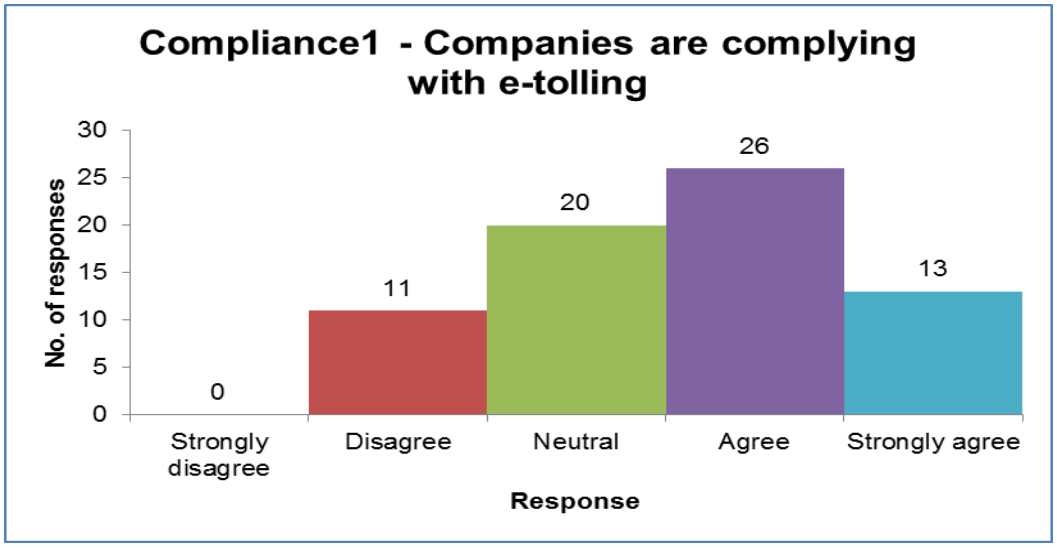


Table 32: Compliance1: Descriptive statistics

Compliance1	
Mean	3.586
Median	3.609
Mode	4.000
Std. Deviation	0.970
Skewness	-0.151

Cross tabulations were run comparing the Compliance1 construct and question 3 as shown in Table 33. The results of the chi-square test in Table 34 show that there is no significance between the two as p > 0,05.

Table 33: Crosstab of Compliance1: vs. How much is your e-toll bill each month?

Compliance1 * How much is your business' e-toll bill each month? Crosstabulation									
	How much is your business' e-toll bill each month?								
Compliance1: Companies are complying with e-tolling	Response	0	R1 - R1000	R1,001 - R5,000	R5,001 - R10,000	R10,001 - R100,000	Above R100,000	Unsure	Total
	Disagree	0	4	1	1	2	2	1	11
	Neutral	2	4	2	3	6	2	1	20
	Agree	0	2	4	9	9	1	1	26
	Strongly agree	0	0	2	3	6	2	0	13
	Total	2	10	9	16	23	7	3	70

Table 34: Chi-Square test of Compliance1: vs. How much is your e-toll bill each month?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.104[a]	18	0.327
Likelihood Ratio	21.670	18	0.247
Linear-by-Linear Association	1.794	1	0.180
N of Valid Cases	70		

Cross tabulations were also run comparing the construct to question 1 ‘How many vehicles are there in your business fleet?’ and question 2 ‘How many of these vehicles operate in Gauteng?’. The chi-square tests for both showed p > 0,05 indicating there was no significance between the variables as shown in Table 35 and Table 36.

Cross tabulations were run comparing the Compliance1 construct to the Fairness1 construct. There was no significance between the variables as indicated in Table 37, as P > 0,05. The correlation between Compliance1 and Fairness1 was 0,39 with p > 0,05 indicating the relationship between the variables was not significant.

The result is to reject the null hypothesis, as companies are complying with e-tolling despite fleet size, fleet operating in Gauteng and the amount of their monthly e-toll bill.

Table 35: Chi-Square test of Compliance1: vs. How many vehicles are there in your business fleet?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	16.910	18	0.529
Likelihood Ratio	18.536	18	0.421
Linear-by-Linear Association	2.258	1	0.133
N of Valid Cases	70		

Table 36: Chi-Square test of Compliance1: vs. How many of these vehicles operate in Gauteng?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.960	18	0.192
Likelihood Ratio	25.499	18	0.112
Linear-by-Linear Association	2.509	1	0.113
N of Valid Cases	70		

Table 37: Chi-Square test of Compliance1: vs. Fairness1

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.387	16	0.570
Likelihood Ratio	14.546	16	0.558
Linear-by-Linear Association	0.139	1	0.709
N of Valid Cases	70		

5.9 Results from semi-structured interview with the Operations Manager of a transport company

An interview was held on 28 August 2015 with the Operations Manager responsible for South Africa of a transport group that operates in South Africa, Zimbabwe, Zambia and

Democratic Republic of Congo (DRC). The purpose of the interview was to discuss the results from the survey and to gain insight on relevant items that were not tested in the survey. The Operations Manager was one of the respondents of the survey. The survey was held in the office of the Operations Manager in Kempton Park. The interview commenced at 11am and lasted for approximately 35 minutes. The interview was semi-structured allowing for exploration of topics.

5.9.1 Tax fairness, trust in government and efficiency of public spending

The interview started with a discussion on the fairness of taxation and the impact that this was likely to have on the payment. The response was that businesses "don't want to be on the wrong side of the law therefore they have no option but to pay". The comment was made that government needs income in the form of taxes to run the country. When the question of wasteful expenditure and corruption was raised, the comment was that this was wrong. The issue surrounding Nkandla was discussed where the comment was made by the interviewee that the public would not have known about it had it not been reported in the media. When asked whether this negatively tainted government, the response was yes but that this did not extinguish the responsibility to pay taxes.

The question was asked whether the spending on the GFIP was efficient, the response was "I don't know and therefore cannot comment". Even after informing the respondent that R50bn had been spent on the freeway upgrades, the same comment was made. The interviewee affirmed that he felt that the freeways needed upgrading but when asked whether the upgraded roads were having a positive impact on his business, his response was that there was no real benefit. He stated that companies in the business of doing shorter routes may see an improvement as it was now easier to get on and off the freeways, whereas the long distance hauliers would have seen no difference.

When other routes were mentioned, specifically the N3, the interviewee commented that the tolls on that road were fair as all vehicles had to pay. In addition, he mentioned that because concession holders operated sections of that road, the toll money spent was on maintenance. If those roads were to change to e-tolled roads, he mentioned that the maintenance of those roads would decline.

5.9.2 Financial impact on business, additional administration costs and changes in operating behaviour

When asked whether e-tolling was having a negative impact on company finances, the response was that it was but that businesses had to build the cost into their rates charged to customers. The comment was made that that the finance impact is not being shared by all businesses "as taxis and busses don't have to pay". There are also a substantial number of vehicles using the freeways with counterfeit number plates and those businesses "will never pay and it's unfair on local transporters". When asked specifically whether his business was paying e-tolls, the response was that they were on their South African registered fleet but not on fleet registered outside of South Africa.

When the discussion was broadened to all businesses using the freeways, the comment made was that people complain about e-tolling but they still pay e-tolls. The interviewee responded that there had to be other ways of raising the funds. "Why didn't they work it into fuel taxes? It would have been much easier with less paperwork and everyone would be happy". When asked whether e-tolling had created additional administration costs in the business, the response was "yes". The interviewee commented that his business had not changed their driving routes because of e-tolling.

The question was asked whether a company under financial distress would avoid using the tolled freeways, to which the response was no they would still use the freeways but just not pay their account. The interviewee commented that his company had not been able to raise their rates because of e-tolling as their clients were not interested in whether the business was paying for e-tolling, they would only be interested in obtaining a service for the cheapest possible price. Their customers are would argue that the business does not have to make use of the tolled freeways therefore they would not want to pay a transport company additional rates because of driving on the tolled freeways.

5.9.3 Game theory and compliance issues

The interviewee was asked whether he thought that a company that was not complying with e-tolling would have a competitive advantage over another company that was complying. His response was no, as the market is price sensitive and customers are always interested in the cheapest price. He commented that a company that was not complying with e-tolling would still continue to make use of the freeways but just not pay

their bill. In short, companies would pay e-tolls to their financial detriment. The question of the consequences for non-compliance was raised, to which the interviewee responded that he was not worried about those consequences as they had not yet been legislated. In addition, he mentioned that the "authorities are threatening to take action but they have not done do as yet". He also raised concerns regarding the ability of the authorities to take action against so many companies and individuals that are not complying.

The results of specific questions were shared with the interviewee. When asked whether he was surprised that 64% of responded disagreed or strongly disagreed that e-tolling was fair, his response was no. When he was told that 63% of respondents had paid their e-toll account in the last two months, he explained that he was not surprised as "people complain about e-tolling but still do another thing" by paying.

5.9.4 Other comments

In closing, the interviewee commented that he thought e-tolling would have to be abolished "as the whole community is against it". By the interviewee's estimates, more than 97% of the community were opposed to it.

5.10 Conclusion

The aim of this chapter was to report the findings of the survey data in order to answer the hypotheses that were formulated in Chapter 3. The methodology described in Chapter 4 was used to generate results on the survey data. The results of this Chapter will be further analysed in Chapter 6 comparing the results of each hypothesis to the literature findings in Chapter 2.

6 Discussion of results

6.1 Introduction

The previous chapter presented the results of the survey conducted. The results of the descriptive statistics, reliability analysis, factor analysis and chi square tests were presented for each component. This section discusses those results.

This research was exploratory research that obtained results using primary data sources. The research findings are aimed at building new knowledge in the field of microeconomics and specifically the e-tolling. As such, the results of this research will not be compared to previous research on the topic, as this research was not based on previous work on the topic. The results of this data will be compared to the literature reviewed, and analysis drawn as to whether the literature is supported.

6.2 Descriptive statistics on independent variables

The results of questions 1 (refer to Table 14) show that respondents were positively skewed toward smaller fleet sizes, with 74% of responses covering the categories up to 100 vehicles. The mean fleet size was close to 50 vehicles with the mode in the 1 – 50 vehicles category. The sizes of fleets decreased dramatically after 100 vehicles, as only 18 of 70 or 26% responses made up the categories from 100 to more than 1000 vehicles.

The correlation between questions 1 and 2 was 0,878 indicating a strong correlation between total fleet size and number of vehicles operating in Gauteng. From this result, it is clear that RFA membership is highly correlated toward companies whose fleets operate in Gauteng. For question 2, there was a greater weighing of fleet numbers under 100 at 84% (refer to Figure 2) compared to question 1.

One would expect a high correlation between the results of questions 2 and 3, as both of these questions are specific to Gauteng. The correlation between these questions was 0,571 and was significant as $p < 0,05$ though may had been higher had flat rates been applied instead of variable pricing according to vehicle type, frequency of use and time of use (Government Gazette, 2015). The data obtained does not give details of specific fleet composition of each respondent; as such detailed analysis of the amount of e-tolling

and correlating this back to question 2 on a more accurate basis is not possible. As the survey was designed to test the hypotheses and not focus specifically on fleet composition, it was decided against including further questions that interrogated fleet composition. The mean for question 3 was 3,16 or slightly over R5,000 per month. The mode was in the category of R10,001 to R100,000 (refer to Figure 3). There was a significant relationship between question 3 and the CoFinances1 component, indicating that the monthly e-toll bill was having a significant negative impact on company finances despite the amount of the amount of the e-toll bill.

6.3 Hypothesis 1: Companies do not see e-tolling as fair

Alm & Torgler (2011) found that individuals undertook a variety of actions to reduce their tax liabilities when taxes were seen as unfair. Adding to this literature, Luttmer & Singhal (2014) found that taxes that were seen as fair were more likely to be complied with. Both of these studies and hence their conclusions were reached based on studies of individuals. This research targeted companies in order to establish whether the findings in literature on individuals were applicable to companies.

The Fairness1 construct was reliable with a CA measure of 0,659 (refer to Table 2). Factor analysis was appropriate on this construct as $p < 0,05$ (refer to Table 6). The Fairness1 construct showed that 50% of respondents agreed that e-tolling was not fair with a further 31% strongly agreeing. Only 3% strongly disagreed or disagreed with 16% remaining neutral (refer to Table 15). The results are heavily weighted in agreeing that e-tolling is not fair.

Lopes (2010) found that there was a degree of stability in the beliefs of economic fairness in a society, as the implementation of new regulations does not result in a shift in the minds of citizens. This research supports that view, as the overwhelming response was that e-tolling was not fair to companies.

The Fairness1 construct showed a significant relationship to question 3, ‘How much is your business e-toll bill each month’. This finding is appropriate given that companies are likely to be aggrieved by the amount that they have to pay over in taxes.

6.4 Hypothesis 2: Companies see the spending on e-tolling as an inefficient use of public funds

The reliability of the Efficiency construct was 0,620 but could not be improved to a reliable 0,650 despite eliminating additional variables (refer to Table 3). This was likely due to use of questions generated independently by the researcher without reference to past literature testing efficiency of public spending.

Two components were extracted from the Efficiency construct representing 61,755% of the variance (refer to Table 9). The first component, EfficiencyImpact1 comprised questions 9, 10 and 11. The distribution of the EfficiencyImpact1 component was close to being normal with a mean and median close to neutral and a mode of neutral (refer to Table 19). The results of analysis on this component show that the spread of responses across the categories and did not show a strong skewness as may have been expected.

This is better explained when considering the results of the individual questions (refer to Appendix 13: Results of individual questions 4 – 20). The results from question 9 show a close to normal distribution. From the results of question 9, it cannot be proved that the upgrading of the Gauteng freeways was an inefficient use of public funds. The results of question 10 were similarly close to a normal distribution. The responses received for this question could not adequately prove that the upgraded freeways were having a positive impact on the respondents' business. Question 11, by contrast, showed that the results were positively skewed towards strongly disagree. This question was conclusive that e-tolling was not an efficient method to pay for the upgraded freeways. As these three questions together comprise the component, the results of the component were close to a normal distribution as shown in Figure 5.

The assumption that public investment is inherently productive as proposed by Dabla-Norris et al. (2012) is supported by this research. The research found no statistical significant findings of inefficiency of public spending, as confirmed by the data analysed and results of the interview conducted. The concerns of OUTA regarding the inefficiency of use of public funds (OUTA, 2015) could not be confirmed by results of this component. Similarly the inefficiency of public spending suggested by Barone & Mocetti (2011) could not be supported by this research.

There was a significant relationship between the Efficiency1 component and question 3. This is appropriate as the three questions comprising this component all have payment and financial impact in common.

Factor analysis resulted in the grouping of questions 8 and 12 grouped together to form the UpgradesRouteChange2 component. The results of this component showed skewness of -0,615 (refer to Table 22). Table 23 shows 69% or respondents agreeing or strongly agreeing that upgrades to the Gauteng freeways were needed and that their business had changed their driving routes because of e-tolling, compared to 6% that disagreed or strongly disagreed.

The results of the cross tabulations of the UpgradesRouteChange2 component are unsurprising given how the respondents interpreted the questions. The researcher intended for one component to be extracted and analysed instead of two. This component suffers from unreliability of the questions asked as confirmed by the CA result.

In summary, this construct suffers from unreliability resulting in the questions asked not being answered in the manner expected. It is likely that a type 1 error may be present, which is a rejection of the null hypothesis when it is true.

6.5 Hypothesis 3: Compliance with e-tolling is having a negative impact on company finances

Questions 13 to 16 comprising the Financial Impact construct showed strong reliability with CA = 0,846 (refer to Table 4). KMO was 0,786 and Bartlett's test of test of sphericity showed significance as $P < 0,05$ indicating that factor analysis was appropriate on the component.

From Figure 7, 74% of the respondents agreed or strongly agreed that e-tolling was having a negative impact on company finances. This is the vast majority compared to 6% who disagreed or strongly disagreed that e-tolling was having a negative impact on company finances. Kramberger & Curin (2011) argued that an optimal road tolling system is one that results in economic benefits to society. When measured in terms of the impact on company finances, the results of this research found that e-tolling was having a negative impact on company finances therefore the e-tolling system cannot be

described as optimal. This research supports the findings of Schürenberg-Frosch (2014) who found that the increase in taxation in the form of tolls adds an additional category of cost to businesses thereby decreasing margins. The theory of road improvement as suggested by Olsson (2009) was not supported by this research due to e-tolling adding to cost instead of reducing it.

The results of the cross tabulations found significance between CoFinances1 component and questions 1, 2 and 3. This is unsurprising given that the strength of the reliability and adequacy of the factor analysis performed. This result means e-tolling is having a negative impact on company finances, whether one considers the size and location of fleet or the amount of the company's e-toll bill.

When analysing the data obtained from the semi-structured interview, the comment was made that e-tolling was having a negative impact on company finances, but that this cost should be worked into the rates that were being charged to customers. When this was explored further a slight divergence from this initial finding was revealed as customers were not willing to bear the additional cost relating to e-tolling. In short, the cost is being borne by the company. Companies are responsible corporate citizens as suggested by Christensen (2011), despite the negative financial impact of e-tolling.

6.6 Hypothesis 4: Companies are not complying with e-tolling

The literature reviewed found that a large number of individuals were complying with taxation regulations, but that there were few examples could be found relating to corporates (Alm & Torgler, 2011). This hypothesis aimed to test whether this held true for corporates. The results from this quantitative study demonstrated that the scale showed adequate reliability as CA = 0,712 (refer to Table 5). Question 20 'The consequences for non-payment of e-tolls is a major factor influencing our business decision to comply / not comply' reduced the variance explained by the component to 56,307% from 73,453% when the question was excluded as seen in Table 13. The component excluding question 20 showed a mean response that was closer to agree than neutral (refer to Figure 8). The results of this component show that 66% of respondents agreed or strongly agreed that they were complying with e-tolling compared to on 16% that disagreed with 29% remaining neutral (refer to Figure 8). The results do not support the findings of Estache & Wren-Lewis (2009) who found that institutions and compliance was lower in developing countries than in developed countries.

The results of the Compliance1 component show there is overwhelming compliance displayed by respondents of the survey to e-tolling. This is in contrast to the findings of Besley & Persson (2014) who found that perception that a tax system is unfair did not hinder the emergence of a norm of compliance toward e-tolling. This data found that members of organisations knew which types of compliance behaviours were permissible and acted to comply with those, in contrast to the ethical difficulty suggested by Wiltermuth & Flynn (2013). The results of question 19 (refer to Appendix 13: Results of individual questions 4 – 20) showed that in 63% of the respondents agreed or strongly agreed that a senior person made the decision to comply / not comply with e-tolling compared to only 16% who disagreed or strongly disagreed with the statement. The result of this question 19 and the Compliance1 component support the findings of Schaubroeck el al, (2012) who found that leaders impart ethical values on their organisations.

Small businesses are likely to display less compliance to taxes than large businesses (Kamleitner, Korunka, & Kirchler, 2012). This research showed that fleet size did not have a significant relationship to the Compliance1 component. Large corporates, who have substantial resources available to exploit tax avoidance (Dowling, 2014) similarly displayed a high level of compliance toward e-tolling. The results of this research found that both small and large businesses were complying with e-tolling in contrast to the findings of Gangl, Torgler, Kirchler, & Hofmanna (2014). This research did not support the findings of Pache & Santos (2010) who found that organisations were unlikely to comply with regulation. The results from the semi-structured interview did not support the findings of Traxler (2010), as companies are aware of the tax evasion practices of other members of society yet they show overwhelming compliance.

Stakeholders' interests, including the interest of the tax authorities significantly influence the actions of managers toward compliance (Crilly, Zollo, & Hansen, 2012) as confirmed in the semi-structured interview. The chi-square results of $p > 0,05$ comparing Compliance1 to Fairness1 (refer to Table 37) as well as the very low correlation and significance between these variables shows that fairness of taxation was found not to significantly influence the compliance decision of taxpayers, in contrast to the findings of Luttmer & Singhal (2014) conducted on individuals. The results of this research supports Rossi (2010), as managers behave morally in terms of compliance decisions.

The results of the semi structured interview revealed that companies were complying with e-tolling because companies did not want to be on the wrong side of the law. The results of this research were in contrast to the findings of Nugent (2013) as noncompliance was not justified in order to correct inequality and unfairness.

6.7 Game theory

Companies that were not complying with e-tolling would continue to make use of the tolled freeways but would not pay their e-tolls, as suggested in the semi-structured interview which is in contrast to the findings of Henderson, Shalizi, & Venables (2001). This would leave companies that were complying at a financial disadvantage compared to their non-compliant competitors adding weight to the real world strategic decision-making suggested by Bloomquist (2011). This research also supports the findings of Alm & McKee (2004) who argued that some equilibria would not be chosen, such as the decision not to comply with e-tolling in order to realise a financial advantage. The results of the semi-structured interview support the findings of Ritsatos (2014) as companies are risk averse and do not want to be on the wrong side of the law.

Data collected from this research found that companies comply with the spirit of the law thereby contributing toward social good, which is consistent with the finding of Dowling (2014). Taxpayers are however aware of the language and letter of the law as regards to the consequences for noncompliance not yet having been enacted into law, specifically referring to results of the semi-structured interview and question 20. The results of this question may change should legislation change preventing the licencing of vehicles with outstanding e-tolls.

6.8 Trust in government

The research found that there was considerable distance between taxpayer and authorities leading to the overwhelming response that e-tolling is unfair, as suggested by Barone & Mocetti (2011). Despite the perceived unfairness of the e-tolling system and the low trust in government, the results of the semi-structured interview found that businesses still acknowledged their responsibility to contribute toward the successful running of the country in the form of compliance. This research confirmed the findings of Torgler (2005) as trust in the President is closely associated public spending efficiency.

The work of Slemrod (2002) could not be supported by this research as lack of trust in government did not lead to increased tax evasion concerning e-tolling. Similarly, Cullis, Jones, & Savoia's (2012) findings that compliance with taxation is sensitive to signals emitted by political leaders was not supported by this research.

6.9 Conclusion

This research proved hypothesis 1, as companies do not see e-tolling as fair. Hypothesis 2 was rejected as there was inconclusive evidence that companies see the spending on e-tolling as an inefficient use of public funds. This hypothesis suffered from unreliability of the questions being asked as well as an interpretation of the questions by respondents, hence a type 1 error cannot be ruled out on this hypothesis.

There was strong evidence to support hypothesis 3 that stated that compliance with e-tolling is having a negative impact on company finances. Hypothesis 4 was rejected as companies are clearly complying with e-tolling. This result was interesting despite the unfairness of the e-tolling system, the negative impact on company finances and questionable levels of trust in government.

The results from testing game theory found that companies that were not complying with e-tolling would be at a financial advantage over those that were complying, however noncompliance would not necessarily result in a change to operating routes. Compliance was the overriding factor in decision making concerning e-tolling.

This study confirmed and contradicted many relationships described in literature. The main differences were that conclusions concerning compliance reached on studies of individuals were not necessarily true of businesses, as businesses showed statistical compliance to e-tolling.

7 Conclusion

7.1 Introduction

This chapter aims to highlight the main findings of the research, offer recommendations to stakeholders based directly on the findings, and provide suggestions for future research and managerial implications.

The conclusions were reached by keeping the aim and objectives of this study in mind to ensure that they were met. The aim was to investigate the compliance of businesses to Gauteng's e-tolling. The responses were investigated by means of obtaining insight from respondents in the road freight industry.

7.2 Principal findings

This research provides an academic contribution to the microeconomics field as well as practical implications for stakeholders in the business field and managers within companies relating specifically to e-tolling. The academic contribution provides a case study of South African business that confirms certain theories of tax morality and compliance related to individuals while challenging others. Of particular importance are the findings that theories relating to individuals are not applicable to companies. The findings related to game theory suggest that companies that decide not to comply with e-tolling, would not alter their operating behaviour by avoiding the tolled freeways.

In general, while tax fairness in an important factor in determining the business response to e-tolling and financial implications are significant to all businesses, compliance is an overriding factor in determining how businesses have responded to e-tolling.

The objectives below were set out and the corresponding key conclusions were reached.

7.2.1 To determine whether businesses considered the e-tolling as fair

The overwhelming response achieved from the data was that e-tolling is not seen as fair by businesses. The results from the chi-square tests indicated that there was a significant relationship between fairness and the amount that the respondents were paying in monthly e-tolls. The literature reviewed suggested that similar to individuals, companies found that taxes were unfair (Alm & Torgler, 2006) but unlike individuals, the research suggests that this had little bearing on the overall compliance practices of the companies.

7.2.2 To determine whether businesses considered e-tolling as an efficient use of public funds

The results suggest there was a strong need for upgrades to the Gauteng freeways prior to the implementation of e-tolling. The results were less conclusive when answering the question of whether the upgrades to the Gauteng freeways constituted an efficient use of public funds. Similarly, the results were not conclusive when testing whether the upgraded freeways were having a positive impact on business. Businesses were strongly opposed when considering e-tolling to be an efficient method to pay for the upgraded freeways but the responses were dispersed when responding to whether businesses had changed their driving routes because of e-tolling.

The components extracted from the factor analysis resulted in a rejection of the hypothesis, though this was due to insufficient evidence to support it rather than evidence conclusively favouring the alternate hypothesis.

Literature findings suggesting that inefficiency in public spending may lead to a lower compliance level (Barone & Mocetti, 2011) were not supported by this research. Those that felt that public funds had been wasted and had low tax morale (Molero & Pujol, 2012) still displayed compliance toward e-tolling. The data could not conclusively answer whether businesses considered the upgraded freeways to be an efficient use of public funds.

7.2.3 To determine compliance with e-tolling was having a negative impact on company finances

The results indicate overwhelmingly that e-tolling was having a negative impact on company finances. The chi-square tests showed significance for total fleet size, fleet size in Gauteng and the amount of the business e-toll each month measured against the component. The conclusion reached confirms findings in the literature review that firstly e-tolling was not an optimal road tolling system (Kramberger & Curin, 2011) and secondly, e-tolling was adding an additional category of cost to business resulting in a decrease of their margins (Schürenberg-Frosch, 2014).

7.2.4 To determine whether companies were complying with e-tolling

The results indicated that the size of fleet was not significant when testing whether companies were complying with e-tolling. The size of a company's fleet and fleet in Gauteng similarly were not significant when testing whether companies were complying with e-tolling. The results showed that companies were complying with e-tolling despite finding it to be an unfair system.

The conclusion reached is that companies are complying with e-tolling and therefore it does not support the literature that states that tax fairness affects compliance or that taxes that were seen to be fair were more likely to be complied with (Luttmer & Singhal, 2014). Literature by Alm & Torgler (2011) relating specifically to individuals who reduced their tax liabilities when taxes were seen as unfair, was not relevant to companies. The companies surveyed generally display the most important aspect of corporate citizenship, by not avoiding to pay for e-tolls (Christensen, 2011).

7.3 Implications for stakeholders

This research has relevance to those in government as well as those responsible for determining policy. The King III report is authoritative and clear that directors of organisations such as SANRAL should consider the legitimate interests and expectations

of all stakeholders and not only those of shareholders. The evidence suggests e-tolling is perceived to be unfair yet SANRAL and government are persisting with a system that is achieving significance compliance by businesses. Government should be aware that unfair taxes have been repealed in the past in the United Kingdom (Besley, Jensen, & Persson, 2014) and businesses would welcome this.

Government should place greater emphasis on the high compliance levels by business and highlight the efficiency of the e-tolling system as a method to increase compliance levels to the desired targets (Maciejovsky, Schwarzenberger, & Kirchler, 2012). Highlighting cases of non-compliance would do little to improve the tax morale of businesses of which the majority are clearly complying, and would instead risk decreasing it (Prinz, Muehlbacher, & Kirchler, 2014).

Lobby groups such as OUTA and others that are opposed to e-tolling should draw greater attention to the financial cost that e-tolling is having on businesses of all sizes and the perceived unfairness of the system as a means of furthering their cause. Alternatives need to be suggested that include greater compliance than is currently being achieved. They should also draw attention to the impact on business and the unintended consequences if costs increase resulting in the burden of payment for the system falling to business.

7.4 Implications for managers

The research is of value to managers in companies who are responsible for compliance decisions within their organisations. These results help companies understand the financial impact that e-tolling is having on their business and are relevant to all companies despite their fleet size, where they operate in the country or the amount of their e-toll bill each month.

Managers in companies that perceive e-tolling as being unfair are in the majority, yet the perceived unfairness has not resulted in a failure to comply with e-tolling. The financial impact that e-tolling is having on business is a cost that companies will try to pass on the

cost to customers, but will have to absorb at least part of the cost resulting in a decrease in their margins. The results of this research show that customers may be unwilling to entertain e-tolling as a reason for an increase in prices. Companies surveyed were similarly unwilling to accept e-tolling as a reason for the increase from suppliers. Managers therefore need to exercise greater cost control in their companies in an effort to reduce the financial impact of e-tolling. Apart from the direct financial impact that e-tolling has created for companies in the form of the toll fees, managers should be aware of the additional administrative costs that need to be accommodated in companies.

Managers need to be informed of the compliance actions of competitors, as this is likely to translate into adverse rate differentials between them and their competitors on a like-for-like route basis where non-compliant competitors continue to use the tolled freeways. Managers may feel constrained by the need to comply with e-tolling in terms of corporate citizenship while simultaneously concerning themselves with cost control and operational challenges likely to impact customer-service levels.

7.5 Limitations of this research

This research is limited to participants from the road freight industry. Generalising these findings across different industries and companies may not be relevant. This research was not conducted as a time-series study resulting in the findings being relevant now. Thus, future research may need to verify the behaviour of respondents in other industries and consider whether there has been and changes to the responses. Furthermore, the respondents are members of the RFA, hence this database could become outdated or have additional members. The number of respondents limited the statistical analysis that could be performed with the data.

7.6 Suggestions for future research

Future research may choose to explore further the relationship between tax fairness and tax compliance as it relates to businesses in general. Future research could also be performed in other areas of non-compliance within tax. The researcher would suggest

the use of more qualitative methods to gain a better understanding of the factors that influence business' perceptions concerning fairness and the factors influencing compliance. Exploration of the relationship and the factors influencing the non-compliance could include specific factors that result in compliance turning to non-compliance. Such research may establish measurable variables that could build a model capable of predicting compliance levels in business. This would necessitate the use of additional statistical techniques and increasing the number of questions asked.

Future research may focus attention on broadening the sample frame to include other industries, to extend the findings beyond the selected industry. Longitudinal research would be of considerable value as a method of measuring the changes in responses over time.

Another area that could be explored in greater detail is the financial impact that e-tolling is having on company finances. As businesses become more accustomed to dealing with e-tolling, information on the impact on company finances may become readily available especially on listed companies. Future studies may investigate alternative methods of recovering the cost of the freeway upgrades compared to the implemented system.

The outcome of efficiency of public spending was not answered adequately by this research. Future studies may focus their attention by exploring questions that can better prove this component.

Future research may be directed toward different stakeholders including lobby groups to measure the factors that are influencing their members. Such studies may include the ranking of factors to enable comparisons to be drawn against the results of this research.

7.7 Conclusion

Businesses perceive e-tolling to be an unfair system that is having a negative financial impact on company finances. Despite this perceived unfairness and the negative impact on company finances, the majority of businesses have high tax morale and comply with the e-tolling system.

Appendices

Appendix 1: Test Questionnaire

No.	Statement / Question	1 - 20	21 - 50	51 - 100	101 - 200	201 - 500	501 - 1000	Above 1000
1	How many vehicles are there in your fleet?							
2	For how many vehicles are you paying e-tolls?							
		Stongly disagree			Neutral			Strongly agree
		1	2	3	4	5	6	7
3	It is fair to charge businesses for e-tolling							
4	It is fair to charge the public for e-tolling							
5	Our business was adequately consulted prior to the decision to implement e-tolling							
6	The improved freeways were a good investment of public funds							
7	E-tolling is a good method to recover the investment made in the freeways							
8	The costs of e-tolling are easy to understand							
9	Our business is paying their e-toll account							
10	We have e-tags in all of our businesses vehicles							
11	E-tolling is the best method to recover the costs of the freeways							
12	There are cheaper ways, other than e-tolling, to pay for the freeways							
13	Our business is prepared to contribute towards the freeways, but not in the form of e-tolls							
14	Our business can afford to pay for e-tolls							
15	We are passing on the cost of e-tolling to our customers							
16	The improved freeways are having a positive impact on our business							
17	We have had to change our driving routes as a result of e-tolling							
18	We were paying our e-tolls before, but not anymore							
19	We were not paying our e-tolls before, but we are now							
20	If the punishment for non-payment increases then we will pay for e-tolls							

Appendix 2: Final Questionnaire

I am conducting research into business' response to Gauteng's e-tolling. To that end, you are kindly requested to complete the following survey. This will help us to better understand how businesses have responded to e-tolling and the reasons why. This survey should not take longer than five minutes of your time. Your participation is voluntary and you can withdraw at any time without penalty. All data will be kept confidential. By completing the survey, you indicate that you voluntarily participate in this research. If you have any concerns, please contact my supervisor or I. Our details are provided below:

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No.	Question / Statement	0	1 - 50	51 - 100	101 - 250	251 - 500	501 - 1000	Above 1000
1	How many vehicles are there in your business' fleet?							
2	How many of these vehicles operate in Gauteng?							

		0 - R1000	R1,001 - R5,000	R5,001 - R10,000	R10,001 - R100,000	Above R100,000
3	How much is your business' e-toll bill each month?					
		Stongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
4	Our business was given the opportunity to voice their concerns prior to the decision to implement e-tolling					
5	E-tolling is a form of tax					
6	It is fair to charge businesses for e-tolling					
7	Businesses have reason to complain about e-tolls					
8	The Gauteng freeways needed to be upgraded					
9	The upgrading of the Gauteng freeways was an efficient use of public funds					
10	The upgraded Gauteng freeways are having a positive impact on our business					
11	E-tolling is an efficient method to pay for the upgraded freeways					
12	Our business has changed our driving routes because of e-tolling					
13	Our business is experiencing additional administrative costs because of e-tolling					
14	Suppliers used e-tolling as a reason to justify increasing their prices charged to us					
15	We have increased the prices of our goods / services charged to customers because of e-tolling					
16	E-tolling is having a negative impact on company finances					
17	Our business has paid their e-toll account in the last two months					
18	Our business will be paying their e-toll account in the next two months					
19	A senior person(s) in our business made the decision to comply / not comply with e-tolling					
20	The consequences for non-payment of e-tolls is a major factor influencing our business' decision to comply / not comply					

Optional information requested:

Name:
Position:
Company:

Appendix 3: Correlation matrix for Fairness construct

Correlation Matrix					
		Our business was given the opportunity to voice their concerns prior to the decision to implement e-tolling.	E-tolling is a form of tax.	It is fair to charge businesses for e-tolling.	Businesses have reason to complain about e-tolls.
Correlation	Our business was given the opportunity to voice their concerns prior to the decision to implement e-tolling.	1.000	-0.205	0.292	-0.329
	E-tolling is a form of tax.	-0.205	1.000	-0.163	0.318
	It is fair to charge businesses for e-tolling.	0.292	-0.163	1.000	-0.574
	Businesses have reason to complain about e-tolls.	-0.329	0.318	-0.574	1.000

Appendix 4: Correlation matrix for Efficiency construct

Correlation Matrix						
		The Gauteng freeways did not needed to be upgraded before e-tolls were implemented.	The upgrading of the Gauteng freeways was an efficient use of public funds.	The upgraded Gauteng freeways are having a positive impact on our business.	E-tolling is an efficient method to pay for the upgraded freeways.	Our business has not changed our driving routes because of e-tolling.
Correlation	The Gauteng freeways did not needed to be upgraded before e-tolls were implemented.	1.000	-0.014	0.080	0.316	0.238
	The upgrading of the Gauteng freeways was an efficient use of public funds.	-0.014	1.000	0.386	0.338	0.244
	The upgraded Gauteng freeways are having a positive impact on our business.	0.080	0.386	1.000	0.335	0.175
	E-tolling is an efficient method to pay for the upgraded freeways.	0.316	0.338	0.335	1.000	0.273
	Our business has not changed our driving routes because of e-tolling.	0.238	0.244	0.175	0.273	1.000

Appendix 5: Rotated Component Matrix for Efficiency construct

Rotated Component Matrix		
	Component	
	1	2
The Gauteng freeways did not needed to be upgraded before e-tolls were implemented.	-0.171	0.871
The upgrading of the Gauteng freeways was an efficient use of public funds.	0.832	0.040
The upgraded Gauteng freeways are having a positive impact on our business.	0.759	0.122
E-tolling is an efficient method to pay for the upgraded freeways.	0.491	0.590
Our business has not changed our driving routes because of e-tolling.	0.282	0.589

Appendix 6: Correlation matrix for Financial Impact construct

Correlation Matrix					
		Our business is experiencing additional administrative costs because of e-tolling.	Suppliers have used e-tolling as a reason to justify increasing their prices charged to us.	We have increased the prices of our goods / services charged to customers because of e-tolling.	E-tolling is having a negative impact on our company finances.
Correlation	Our business is experiencing additional administrative costs because of e-tolling.	1.000	0.663	0.470	0.757
	Suppliers have used e-tolling as a reason to justify increasing their prices charged to us.	0.663	1.000	0.545	0.664
	We have increased the prices of our goods / services charged to customers because of e-tolling.	0.470	0.545	1.000	0.446
	E-tolling is having a negative impact on our company finances.	0.757	0.664	0.446	1.000

Appendix 7: Correlation matrix for Compliance construct

Correlation Matrix					
		Our business has paid their e-toll account in the last two months.	Our business will be paying their e-toll account in the next two months.	A senior person(s) in our business made the decision to comply / not comply with e-tolling.	The consequences for non-payment of e-tolls is a major factor influencing our business' decision to comply / not comply with e-tolling.
Correlation	Our business has paid their e-toll account in the last two months.	1.000	0.900	0.436	0.213
	Our business will be paying their e-toll account in the next two months.	0.900	1.000	0.393	0.178
	A senior person(s) in our business made the decision to comply / not comply with e-tolling.	0.436	0.393	1.000	0.073
	The consequences for non-payment of e-tolls is a major factor influencing our business' decision to comply / not comply with e-tolling.	0.213	0.178	0.073	1.000

Appendix 8: Correlations between questions 1 and 2

Correlations			
		How many vehicles are there in your business' fleet?	How many of these vehicles operate in Gauteng?
How many vehicles are there in your business' fleet?	Pearson Correlation	1	0.878
	Sig. (2-tailed)		**0.000
	Sum of Squares and Cross-products	147	106.229
	Covariance	2.1	1.5
	N	70	70

** Significance at 0,05 level

Appendix 9: Correlations between questions 1 & 3 and 2 & 3

Correlations				
		How many vehicles are there in your business' fleet?	How many of these vehicles operate in Gauteng?	How much is your business' e-toll bill each month?
How many vehicles are there in your business' fleet?	Correlation	1	0.878	0.615
	Significance (2-tailed)		**0.000	**0.000
	df	0	68.000	68.000
How many of these vehicles operate in Gauteng?	Correlation	0.9	1.0	0.571
	Significance (2-tailed)	**0.000		**0.000
	df	68.0	0.0	68.0

** Significance at 0,05 level

Appendix 10: Chi-Square test of Fairness1: vs. How many vehicles are there in your business fleet?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34.064[a]	24	0.084
Likelihood Ratio	30.019	24	0.184
Linear-by-Linear Association	0.005	1	0.944
N of Valid Cases	70		

Appendix 11: Chi-Square test of Fairness1: vs. How many of these vehicles operate in Gauteng?

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34.257[a]	24	0.080
Likelihood Ratio	26.609	24	0.323
Linear-by-Linear Association	2.134	1	0.144
N of Valid Cases	70		

Appendix 12: Chi-Square tests on UpgradeRouteChange2 component

Chi-Square test of UpgradeRouteChange2: vs. How many vehicles are there in your business fleet?

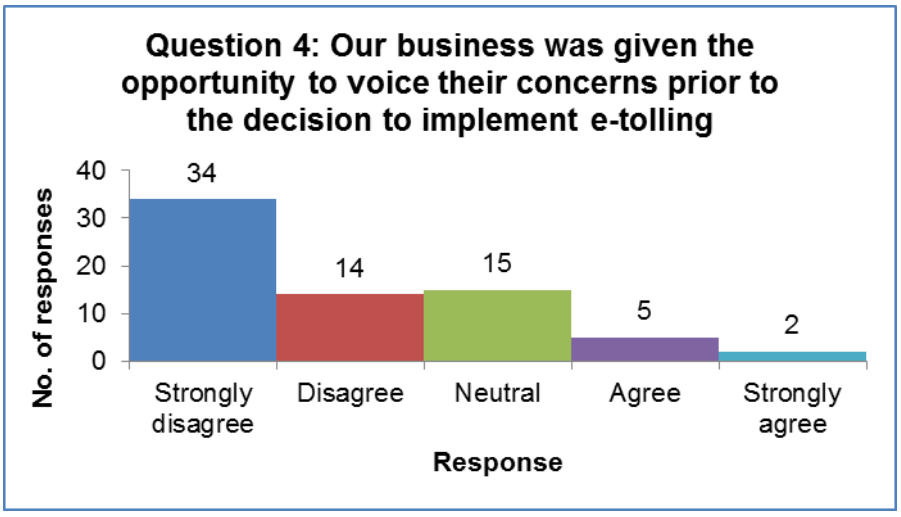
Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	29.001	24	0.220
Likelihood Ratio	18.764	24	0.764
Linear-by-Linear Association	1.440	1	0.230
N of Valid Cases	70		

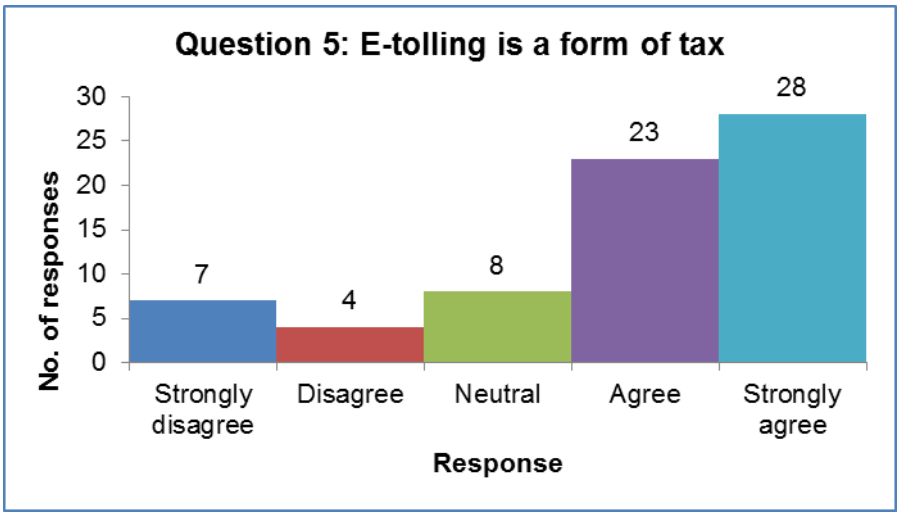
Chi-Square test of UpgradeRouteChange2: vs. How many of these vehicles operate in Gauteng?

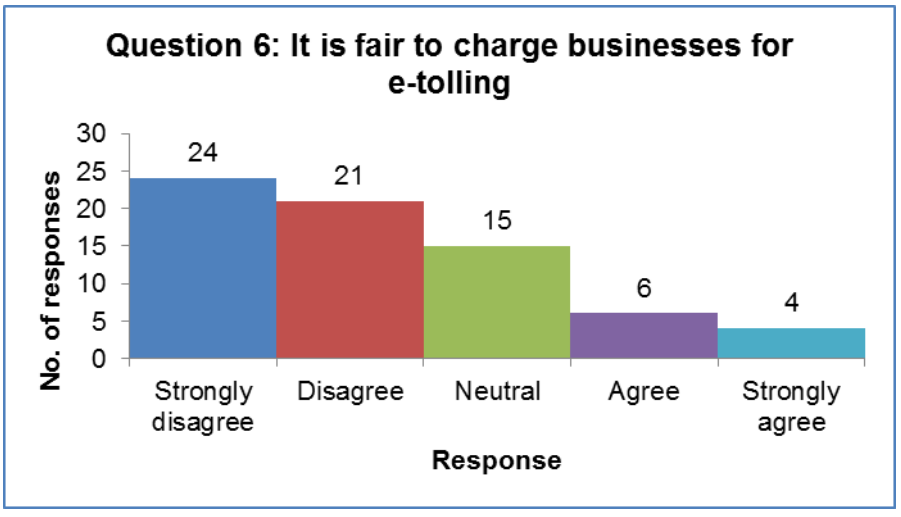
Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	30.132	24	0.180
Likelihood Ratio	25.024	24	0.404
Linear-by-Linear Association	1.429	1	0.232
N of Valid Cases	70		

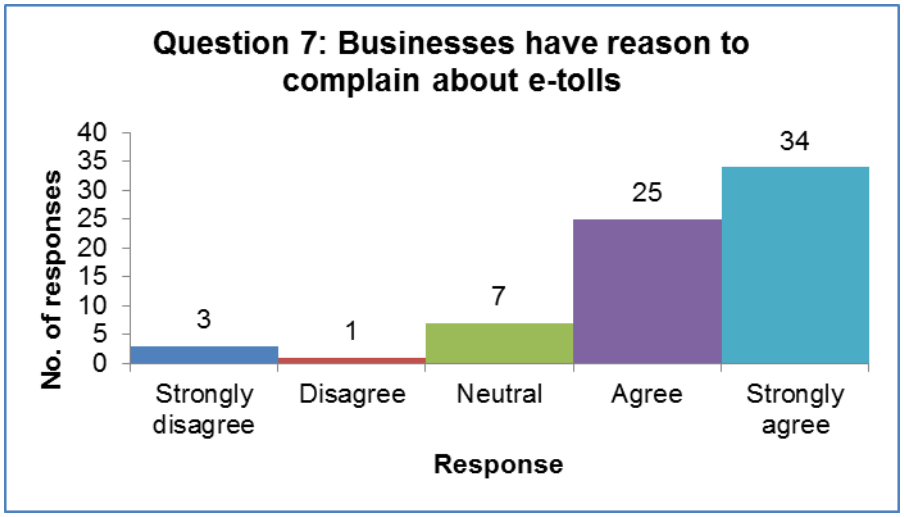
Appendix 13: Results of individual questions 4 – 20

Questions testing fairness

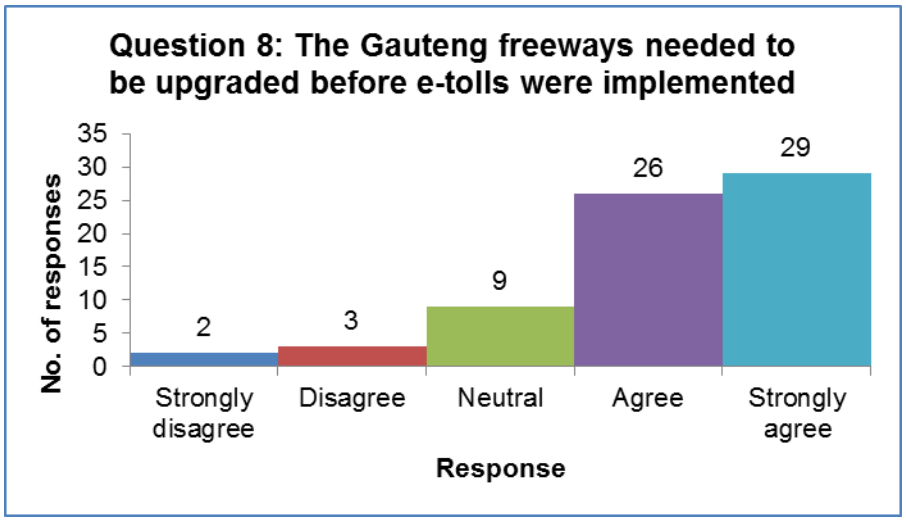


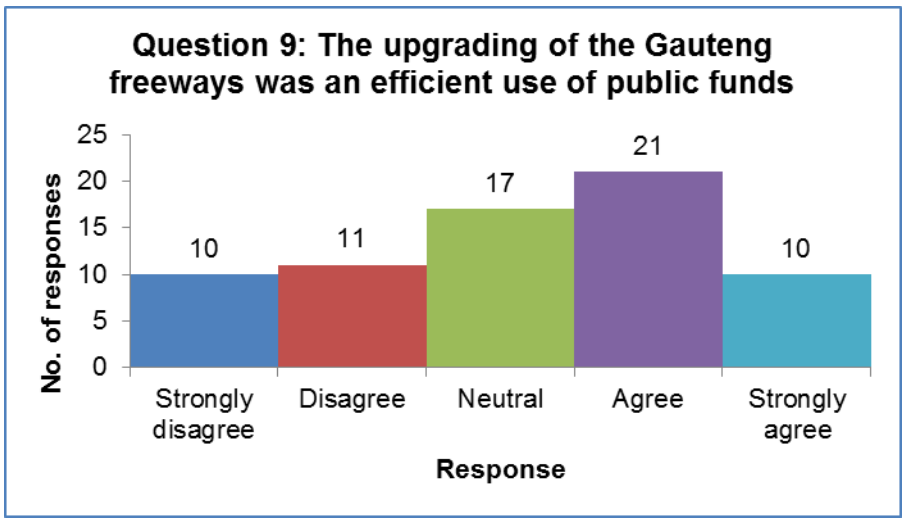


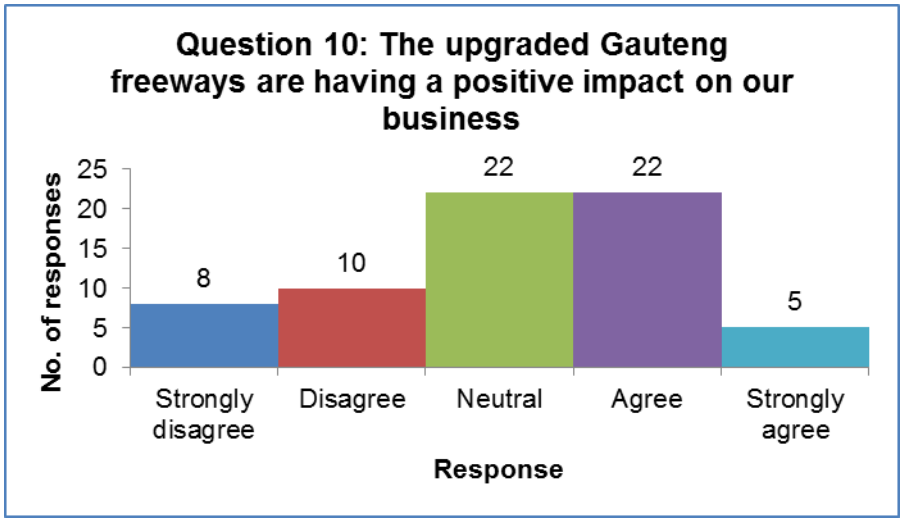


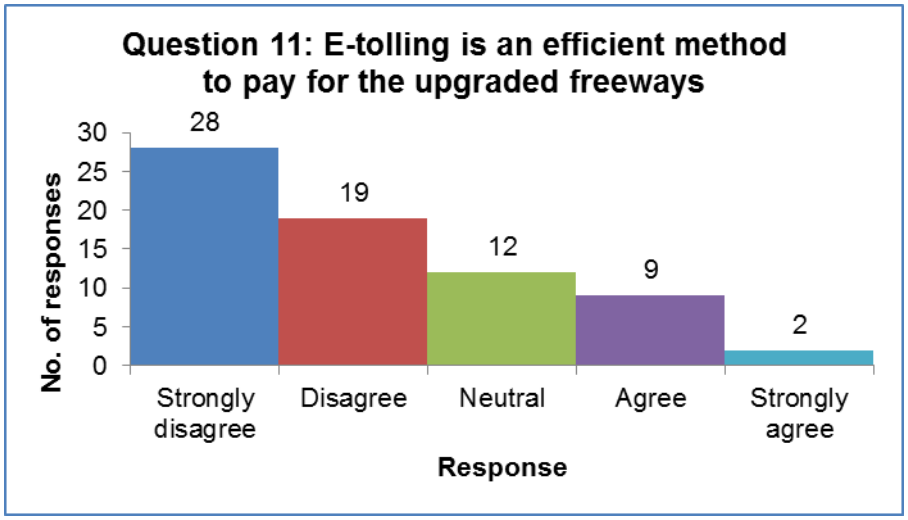


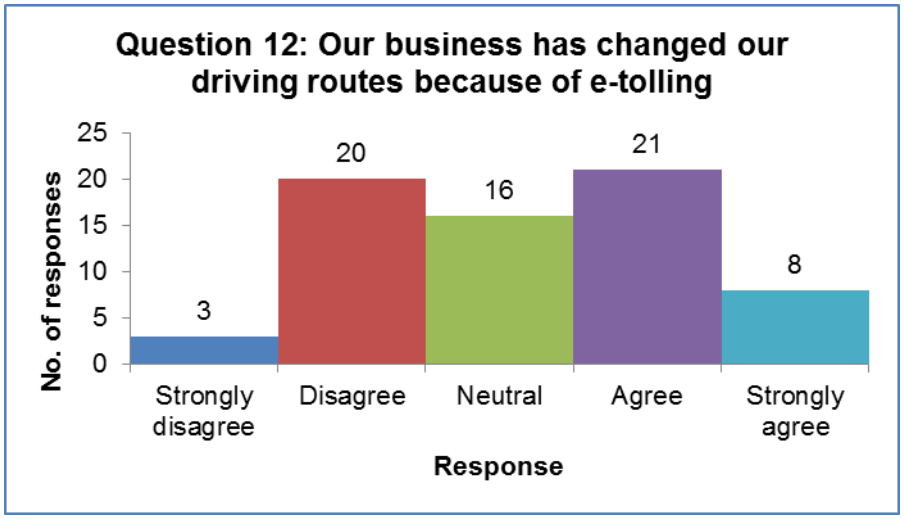
Questions testing the efficiency of public spending



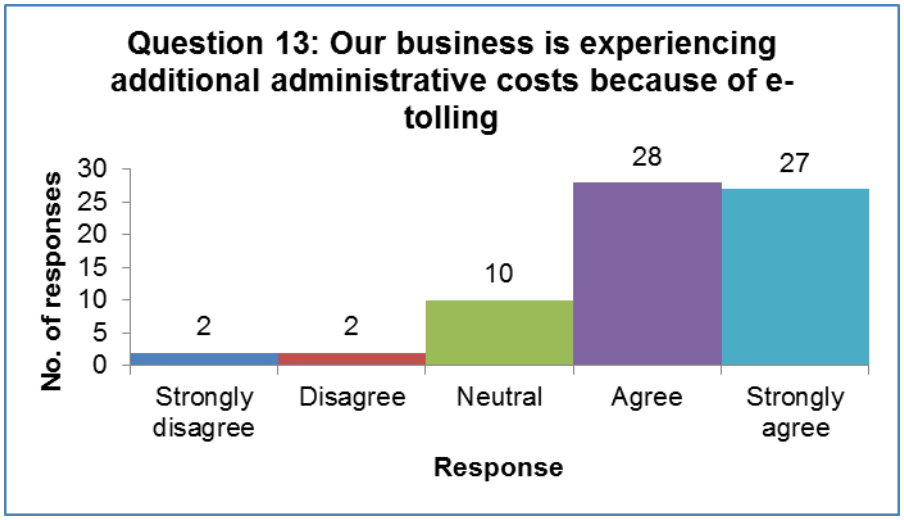


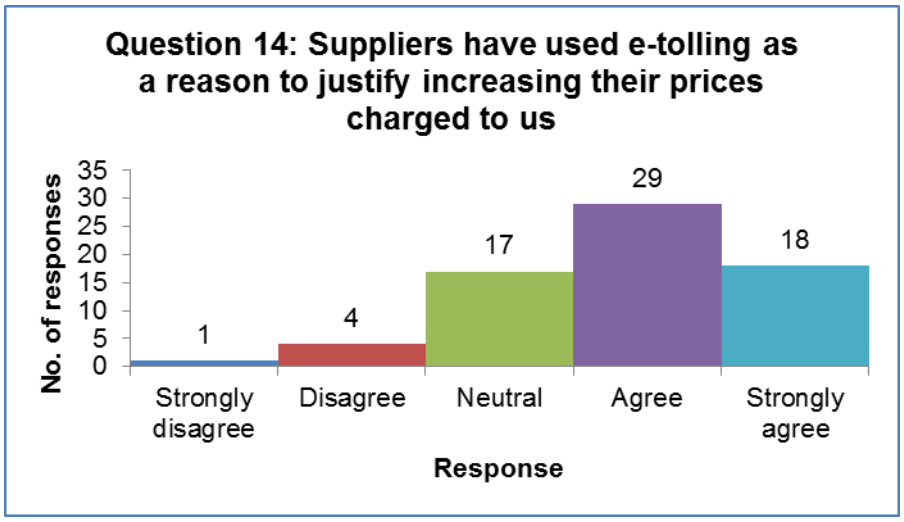


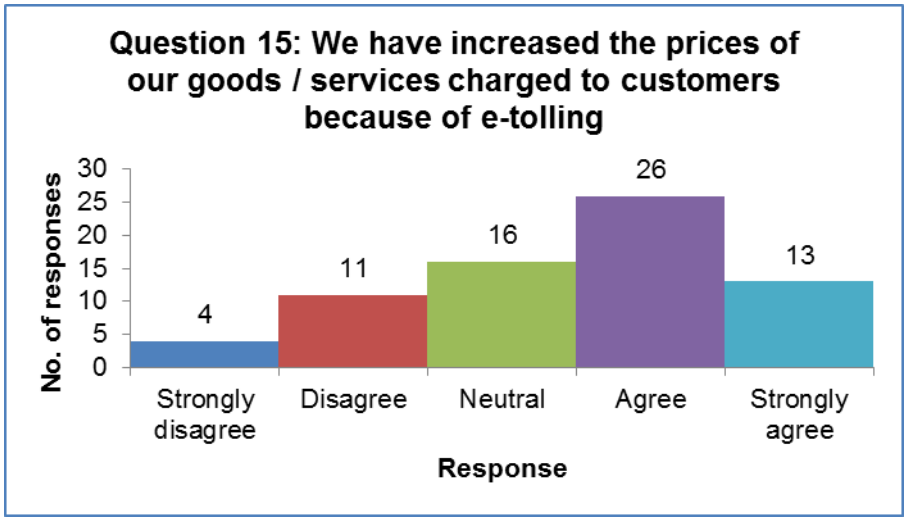


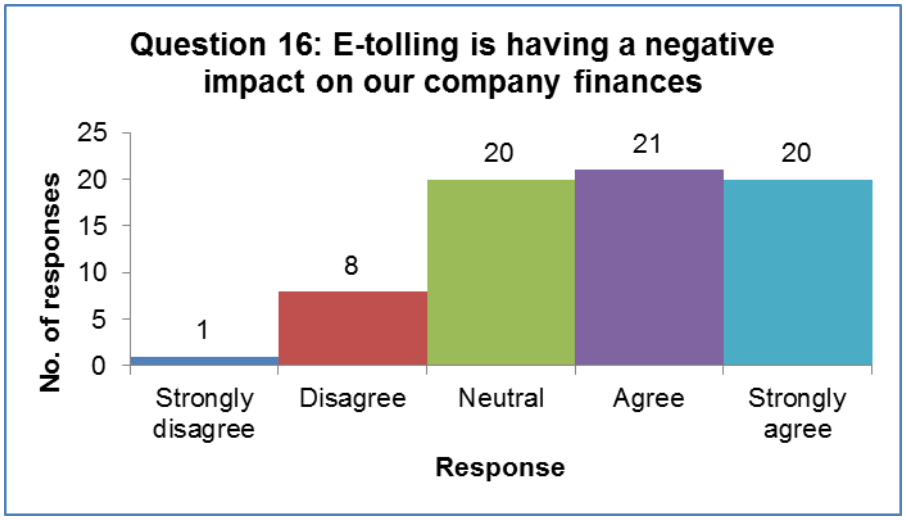


Questions testing the financial impact of e-tolling on business

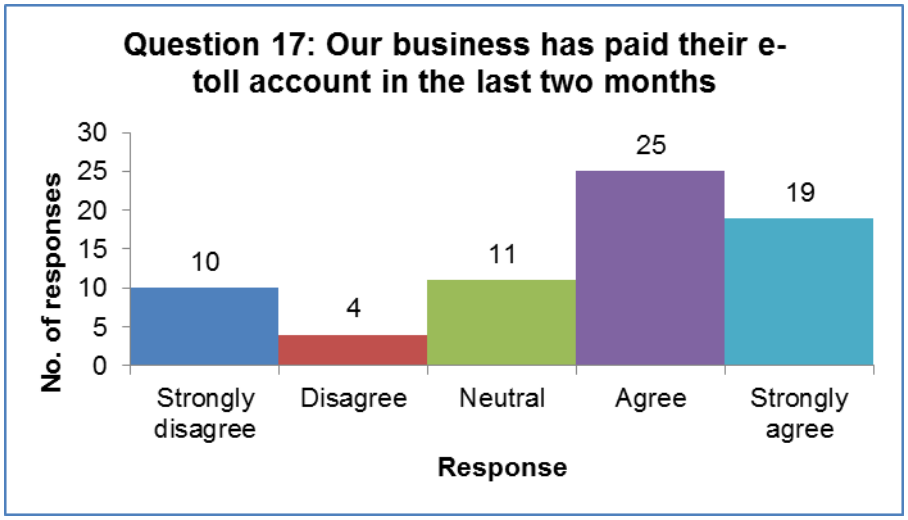


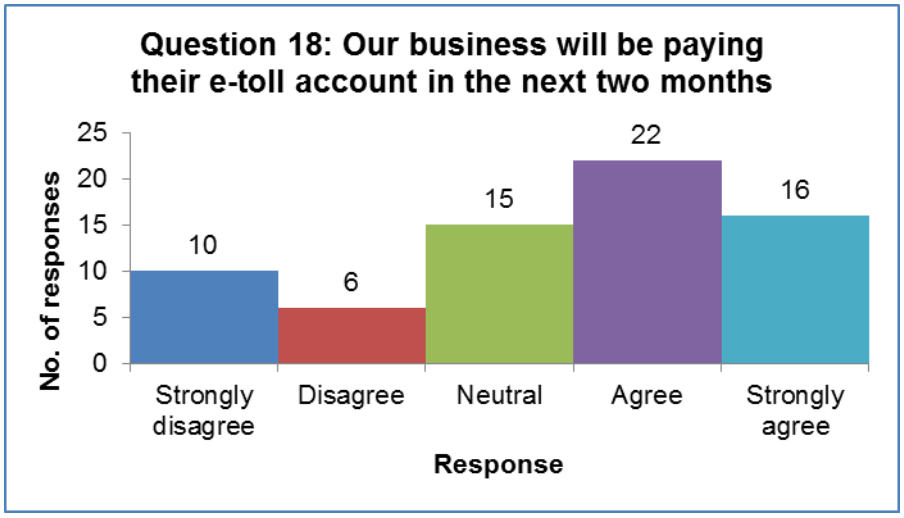


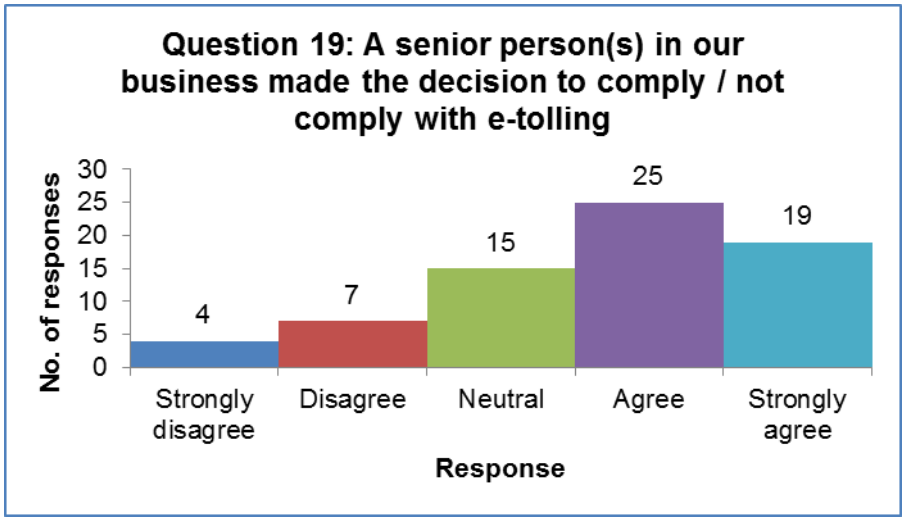


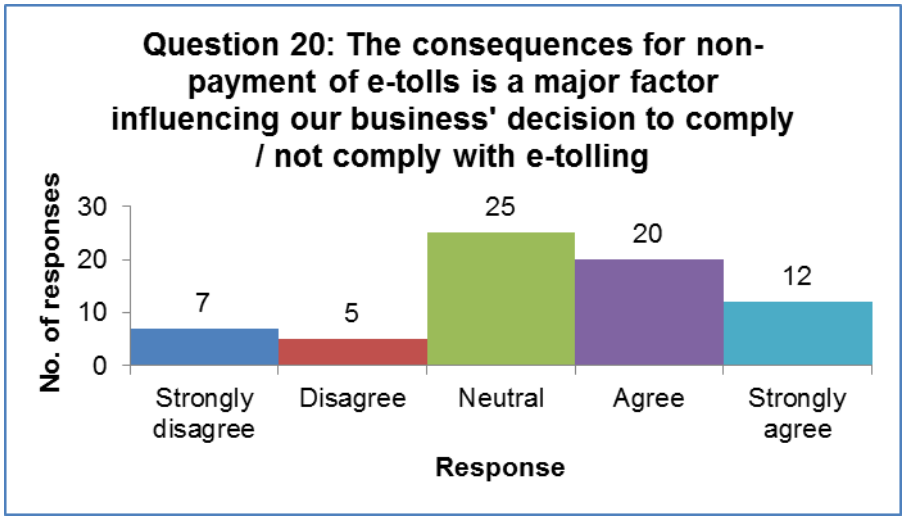


Questions testing compliance with e-tolling









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