

## Effect of Electronic Monitoring on Excise Duty Compliance Among Cigarette Importers in Nairobi County, Kenya

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### Abstract

Excisable Goods Management System, excise duty compliance rates among cigarette importers in Nairobi, Kenya, remain persistently low. The key aim of the study was to determine the effect of electronic monitoring on excise duty compliance among cigarette importers in Nairobi County, Kenya. The study was anchored on the following theories: the Ability to Pay Theory and the Diffusion of Innovation Theory. The study adopted an explanatory research design. The study's target population was 86 cigarette importers in Nairobi County. The study had two respondents from each of the 86 cigarette importers in Nairobi County, making a total of 172 respondents. 143 respondents, that is 83.1% of the 172 respondents who were intended for the study, took part and submitted fully completed questionnaires. The study used primary data, collected through structured questionnaires administered via a drop-and-pick-later method. The collected data were analyzed using both descriptive and inferential statistics. The study analysis found that electronic monitoring had a strong positive effect on excise duty compliance ( $\beta = 0.232$ ,  $p = .014$ ). Regarding electronic monitoring, the study demonstrates its effectiveness in improving excise duty compliance. The government should invest in integrated real-time tracking systems, including GPS and RFID technologies, for all high-risk excisable goods. Policies should also mandate electronic cargo monitoring for all transit goods to prevent diversion and smuggling at border points. Future research should investigate the effects of behavioral factors, such as tax morale and social norms, in shaping excise duty compliance attitudes.

**Keywords:** *Electronic Monitoring, Excise Duty Compliance, Cigarette Importers*

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### 1. Introduction

Governments worldwide depend on tax revenue to provide public goods and services. To meet the growing need for economic development and growth, these governments have developed various tax regimes, systems, and bases (OECD, 2020). Collecting taxes and fees is a fundamental task for countries to generate public revenue, making it possible to finance

investments in human capital, infrastructure, and provide services for citizens and businesses (IMF, 2020).

Tax compliance includes the voluntary payment of taxes by the spirit of the tax laws (committed tax compliance), the payment of tax for fear of penalties and audits in line with the spirit of tax laws, and the payment of taxes after arranging taxpayers' activities to minimize tax liabilities by complying with tax laws (Amon, 2021). Tax compliance is typically measured in terms of tax legislation or the extent to which taxpayers are subject to tax rules. The tax difference, or the difference between the income received and the amount obtained if the maximum rate of 100 per cent were applied, can be used to determine the non-compliance rate (Tule, 2019).

Excise duty compliance means abiding by taxpaying expectations and tax law (Alley *et al*, 2014). Noncompliance with excise duty is the payment of less tax than due or outright failure to pay excise duty or failure to comply with any other obligations on account of excise duty (Muturi, 2019). In recent years, there has been a global shift towards leveraging technology in tax administration, a trend significantly impacting VAT compliance (Belahouaoui & Attak, 2024). This is precisely also stated in the report by OECD on the significance of employing risk-based compliance management strategies, along with the processes of collecting and sharing data, alongside highlighting the crucial nature of cooperation among tax authorities both locally and internationally (OECD, 2021).

In Kenya, the primary excisable commodities include soft drinks, alcoholic beverages, cigarettes, tobacco, petroleum products, motor vehicles, motorcycles, plastic bags, imported sugar confectionery, imported gas cylinders, cosmetics, food supplements, and the importation of furniture and sugar. Excisable services include money transfer services by financial and cellular phone providers, mobile telephone services, and gambling. Excise duty on beer, cigarettes petroleum products is charged on a specific basis, per volume or quantity. Excise duty on motor vehicles, cosmetics, food supplements, furniture, sugar, and services is charged at an ad valorem excise duty rate. One of the main characteristics of these excisable commodities and services is that they have a low own-price elasticity of demand, implying that their responsiveness to price change is low and, hence, minimum shifting of consumer purchases. It is this characteristic that makes high excise duty rates applicable without distorting the market dynamics of demand and supply of these excisable commodities and services.

An Electronic Monitoring System (EMS) is any technology that records the location of an offender within a locality at particular places and times without human observation and transmits these data electronically to a central monitoring station or uses an electronic device to detect the presence of a prohibited substance in the body (or to monitor other physiological functions) of an offender living in community and transmits those data to a central location. This definition includes GPS tracking, logging, and emerging drug-testing technologies (Renzema & Mayo-Wilson, 2021).

A cigarette supplier in Kenya is a company or entity that is involved in the importation of cigarettes, cigarette paper, packaging material, and the production and distribution of cigarettes. Cigarette Suppliers in Kenya are registered and licensed primarily by the Kenya Revenue Authority (KRA) under the Excise Duty Act, 2015, as cigarettes are classified as excisable goods. They must comply with the Tobacco Control Act, 2007, administered by the

Ministry of Health, which imposes additional obligations such as product conformity, packaging and labeling standards, and contributions to the Tobacco Control Fund. refers to a tax levied on goods and services produced within Kenya or imported into the country, as outlined in the First Schedule of the Excise Duty Act, 2015. Excise duty on Tobacco products, including cigarettes, is a key contributor to Kenya's tax revenue. Tobacco taxes (excise duty, VAT, and import duties) account for a notable portion of KRA's collections under excisable goods (KRA, 2022).

### **1.1 Problem Statement**

Despite the implementation of digitalization initiatives such as Excisable Goods Management System (EGMS) in Kenya since 2013, excise duty compliance among cigarette importers and importers remains alarmingly low as evidenced by the illicit cigarette trade capturing 37% of the market in 2025 up from 27% in 2023 (KRA, 2024) resulting in annual revenue losses of approximately Ksh. 9 billion, alongside significant shortfalls in collections from domestic excise duty of 5.75% to 69.39 billion down from 73.62 billion in the financial year ending June 2025 (KRA 2025). This performance is attributed to a decline of revenue remittances from manufacturers of beer and tobacco products by 13.9% and 8.9% respectively. This shortfall, combined with the unaccounted excise stamps totalling 9.7 million by KRA, as reported by the Auditor General for the financial year ended June 2024, is an indication of low excise duty compliance.

Excise tax reforms have been a key component of the overall tax reform package; for example, EGMS in 2013 widened the excise tax base to include other goods and services. Increasing excise tax rates over the years and the use of new-generation excise stamps. Despite these reforms, overall tax revenue mobilisation, including excise taxation, remains low. The collection of Excise Duty in the financial year 2022/2023 was Ksh . 68,124 billion compared to a target of Ksh 79,522 billion, falling short of the target by Ksh 11,398 billion (KRA, 2023). In the financial year 2023/2024, the set target was Ksh. 73.9 billion, yet KRA collected Ksh. 73.624 billion, again falling short of the target by Ksh 276 million (KRA, 2023). In the financial year 2024/2025, KRA collected Ksh. 69.39 billion is missing the revised target of Ksh. 71.38 billion by 2.80%.

This recurring shortfall in meeting the set target has raised a concern, especially on the cigarette excise duty, which has been declining over the years. For instance, in 2020, the revenue was Ksh. 12,221.16 million; further, in the year 2021, the revenue was Ksh . 11,759.14 million, and in the year 2022, the revenue was Ksh. 11,757.73 million (Economic Survey, 2023). In the financial year ending June 2025, revenue from cigarette manufacturers fell by 8.9% (KRA, 2025). Therefore, it is against this that this study was conducted to examine the effect of electronic monitoring on excise duty compliance among cigarette importers in Nairobi County, Kenya.

## **2. Literature Review**

### **2.1 Theoretical Review**

#### **2.1.1 Ability to pay theory**

The ability to pay theory was expounded by Smith (1776). Adam Smith, in *The Wealth of Nations* (1776), stated that such things as defending the country and maintaining the institutions of good government are of general benefit to the public. Thus, it is reasonable that

the population as a whole should contribute to the tax costs. It is also reasonable to demand certain other things from a tax system, for instance, that the amounts of tax individuals pay should bear some relationship to their abilities to pay.

Johnson (2020) The ability-to-pay philosophy of taxation maintains that taxes should be levied according to taxpayers' ability to pay. The idea is that people, businesses, and corporations with higher incomes can and should pay more taxes. The idea underlying ability-to-pay taxation is that everyone should make an equal sacrifice in paying taxes, and because people with more money effectively have less use for a given dollar, paying more of it in taxes does not impose a more significant burden. According to Chigbu, Eze, and Ebimobowe (2021). Individuals should pay taxes in respect of their ability to pay, such that the taxes do not overburden them.

According to Kennedy (2021), the ability to pay theory has been justified based on the equality of sacrifice. The basic tenet of this theory is that the members of society should share the burden of taxation on the principles of justice and equity, and that these principles necessitate that the tax burden be apportioned according to their relative ability to pay. This theory suggests that the excise duty payers should pay unconditionally and according to their paying capacity.

This theory propagates that people should be asked to pay taxes according to their ability to pay, and assessment of their taxable capacity should be made based on income and property. The most popular and accepted principle of equity or justice in taxation is that citizens of a country should pay taxes to the government according to their ability to pay (Limerick, 2013). It can, therefore, be argued and appears reasonable. Just that taxes should be taxed based on the taxable capacity of a person, and in using this principle, it can be stated that if the taxable capacity of one individual is greater than that of the other person, then the person who earns more should be asked and expected to pay more taxes in comparison with the one who earns less. The theory will support the dependent variable, excise duty compliance.

### **2.1.2 Diffusion of Innovation Theory**

This theory was proposed by Rogers (1983) and talks about why, how, and the level at which technology and ideas are new in cultures, performing at firm and individual levels (Bradley, 2009). It sees innovations conveyed over definite channels over a period and within specific social systems (Abdullahi & Nyaoga, 2017). The main idea of the theory is that four elements influence the spread of new ideas, including the social system, time, communication channels, and innovation. The diffusion process involves five phases: persuasion, knowledge, confirmation, implementation, and decision. It results in six user categories: leapfroggers, laggards, late majority, early majority, early adopters, and innovators (Sharma & Mishra, 2015).

The diffusion theory of innovation proposes that adopting innovation is influenced by five common concepts in diffusion and adoption research studies, which are used to evaluate various information technologies and communications (Olatokun & Igbiniedion, 2009). The theory asserts that channels of communication dispense innovative knowledge and play a role in forming attitudes about the innovation by the prospective user, leading to an acceptance or rejection decision regarding the innovation (Bradley, 2009). The diffusion of innovation states that fresh technologies have brought about considerable changes in organizational production, which can be in an order that's continuous or episodic, hence making settings for innovations occur (Miranda et al., 2016). The theory supports electronic

monitoring.

## **2.2. Empirical Review**

### **2.2.1 Electronic monitoring**

Electronic monitoring of transit goods and facilitation system, which was implemented by Jordan, has reduced smuggling along the roads within Jordan but led to increased organized smuggling at the Jordan customs stations after the electronic seals are untagged from the transit goods (Alfitiani 2021). This is a clear indication that electronic tracking deters smuggling of goods on the routes until they reach the border stations. Electronic monitoring, a system implemented by three partner states of Kenya, Uganda, and Rwanda, aims to eliminate the same challenge that had been witnessed for a long time while using the licensed tracking vendors.

Karibu (2021) researched the effects of electronic monitoring on the operational performance of KRA and transporters between Kenya and other East African countries. The findings of the study revealed that the EM has been beneficial in improving performance for both KRA and transporters for outbound cargo. A study conducted by Prado et al. (2023) on the use of electronic monitoring Systems among trucking companies in South Brazil revealed that the system discouraged truck drivers from deviating from the planned route. The use of electronic monitoring Systems also provided effective ways of dealing with theft of transit cargo and also deter transit vehicles from being hijacked. The cargo monitoring process is on a real-time basis, and this is achieved using the Radio Frequency Identification (RFID) and GPS/GPRS technology (Raghu Das & Peter Harrop, 2022).

Mukeshimana (2012) in his study analyzed the effect of electronic monitoring Systems on tax revenue performance. The study used a cross-sectional descriptive survey design to collect data from the Rwanda Authority. Findings showed that the contribution of electronic monitoring Systems on revenue performance is characterized by maximizing revenue collections through minimizing time spent by the taxpayers, availing services to the taxpayers, reducing costs of compliance, improving tax compliance, and adapting new technology. In addition, the findings showed that electronic monitoring improved tax revenue performance. The findings recommended the adoption of electronic monitoring Systems as a way of improving tax performance.

Mugambi (2021) conducted a study to establish the effect of the electronic monitoring system on trade between Kenya and Uganda. The study adopted an exploratory research design and focused on the structure of an enquiry to draw inferences from a causal relationship of the data. The findings were that electronic monitoring adopted by the Kenya Revenue Authority has reduced diversion of cargo to the local markets, as well as clearance time at the border points, and collection of duties and fines has been made easier due to the implementation of the system. The study concluded that the electronic monitoring system improves border efficiency, reduces transit time, and costs for private businesses. The study recommends synchronization of the electronic monitoring and the RFID system being employed by both Kenya and Uganda to create a seamless operation and management of cargo between the two countries.

### **2.2.2 Excise Duty Compliance**

Excise Duty Compliance refers to the adherence of manufacturers, service providers, and importers to the laws and regulations governing the payment, declaration, and remittance of excise duty on specified goods and services. This involves timely filing of returns, accurate



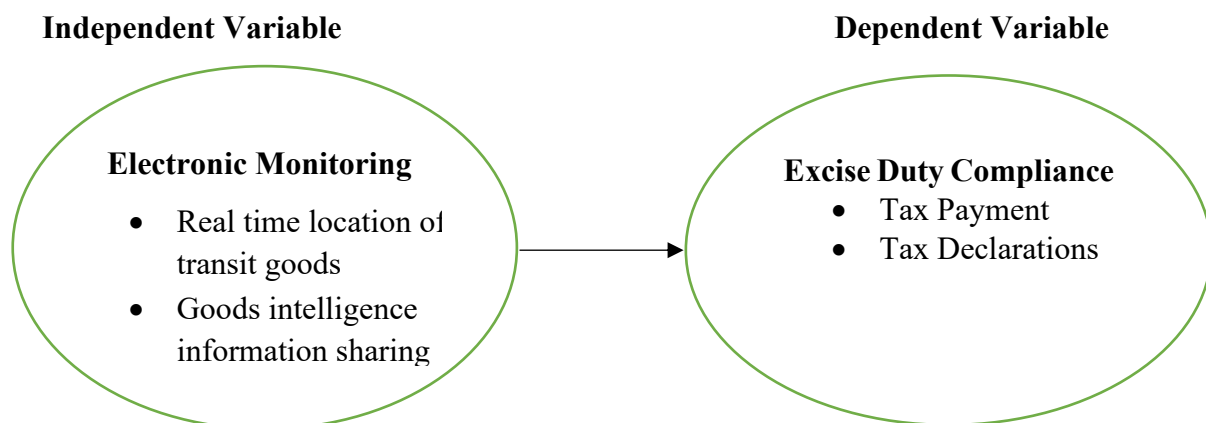
declaration of excisable goods, and full payment of the applicable taxes as mandated by the relevant tax authority. The concept of compliance in this context extends beyond payment, encompassing the maintenance of proper records, accurate classification of products, and adherence to any reporting or procedural requirements outlined in the Excise Duty Act or similar legislative frameworks (OECD, 2020).

Excise taxes are equally levied on products, which causes negative externalities. The Excise Duty Act (2015) introduced a new tax based on units of quantity on harmful goods to compensate for harmful effects caused by production, supply, consumption, or use of goods whose costs are not directly reflected in their price (Deloitte & Touche, 2015). Other Such products include tobacco and alcohol. Excise taxes are also applied to improve the vertical equity of the tax system in the economy. This is seen when excise is levied on commodities seen as luxurious.

In the past, Excise Duty has been one of the tax heads that has proved a challenge, remained static in terms of growth, and was also the most abused and subject to fraud. Very few taxpayers of excisable goods and services filed or declared the correct monthly tax returns; hence, there is a need to rethink outside the box. From 2011/2012 to 2015/2016, after the introduction of iTax and EGMS, excise Duty has significantly grown (KRA, 2017). According to Nyaga (2021), automation seems to have played a key role in controlling illicit and unlicensed mineral water bottlers. However, much is yet to be done to completely curb these unlicensed bottling companies because their distribution channels are not well defined.

### 2.3 Conceptual Framework

A study by Kothari (2004) explains that a conceptual framework is a crucial tool in research. It provides a visual explanation of the relationship between study variables. In the context of this research, the conceptual framework is a diagrammatic representation of the study's variables that links the variables of the inquiry and how they are operationalized (Mugenda & Mugenda, 2013). Creswell (2013) asserted that it helps the researcher to define the concept, map the conceptual scope, systematize relations among concepts, and identify gaps in the literature. The conceptual framework is created to demonstrate relationships between the independent variable, electronic monitoring, and the dependent variable, excise duty compliance. As shown in Figure 1.



**Figure 1: Conceptual Framework**

**3. Methodology**

According to Kombo and Tromp (2009), a research design holds all elements of a research project together. It is used to structure the research to show how all the significant parts of the research project worked together. When the issue is under investigation, the research design provides guidelines for approaching it (Dulock, 2021). Its main goal was to ensure that the information obtained allows the study to respond to the survey questions as unequivocally as possible. This study employed an explanatory research design as it is the most effective in testing the relationship between the independent variables and the dependent variable. Mugenda and Mugenda (2012) defined population as the entire group of individuals, events, or objects with a common observable characteristic that the researcher intends to discover and generalize its attributes for decision-making. The study had two respondents from each of the 86 cigarette importers in Nairobi County, totalling 172 respondents. (KRA, 2024). The two respondents included an accounts manager and a finance manager. The response rate for the survey, as shown in Table 1, that 143 respondents, which is 83.1% of the 172 respondents who were intended for the study took part and submitted fully completed questionnaires.

**Table 1: Response Rate**

	Number	%
Response	143	83.1
Non response	29	16.9
Response Target	172	100

**Reliability analysis**

Cronbach’s alpha was used to evaluate the scale items and compare the two scores obtained. Nunnally (1978) argued that a Cronbach's alpha value of 0.7 and above proves that the research instrument is reliable. This study adopted a coefficient of 0.7 as the reliability threshold. Table 2 shows that excise duty compliance has an alpha value of 0.771, while electronic monitoring has an alpha value of 0.928. The test shows that the items measuring each latent construct were reliable since all alpha values are above the threshold of 0.7.

**Table 2: Test of Reliability of Questionnaire**

Factor	Number Items	of Cronbach's Alpha score	Conclusion
Excise duty compliance	5	0.771	Reliable
Electronic monitoring	5	0.928	Reliable

## 4. Results and Discussion

### 4.1 Descriptive Analysis

#### 4.1.1 Descriptive Electronic Monitoring

Table 3 shows the descriptive statistics for the electronic monitoring questionnaire items reveal varying levels of agreement among respondents. The statement I am aware of the existence of electronic monitoring has a mean response of 4.05 (SD = 0.816), indicating that respondents generally agreed with this statement. For Automated systems to provide timely feedback for excise duty audits, the mean is 3.63 (SD = 0.969), suggesting moderate agreement, with a slightly higher dispersion of opinions. The statement that electronic monitoring excise duty returns have simplified the excise duty filing process has a mean of 4.05 (SD = 0.922). Respondents also largely agreed that the feedback from electronic monitoring is accurate and reliable, with a mean of 4.01 (SD = 1.003). Finally, Electronic monitoring has reduced the need for manual checks, showing a mean of 3.82 (SD = 1.130). The aggregate mean of 3.91 across all items indicates a generally favorable perception of electronic monitoring, though some aspects, such as timeliness and manual check reduction, elicited more varied responses.

**Table 3: Electronic Monitoring**

	N	Mean	Std. Deviation
I am aware of the existence of electronic monitoring	143	4.05	.816
Automated systems provide timely feedback for excise duty audits.		3.63	.969
Electronic monitoring excise duty returns have simplified the excise duty filing process.		4.05	.922
The feedback from electronic monitoring is accurate and reliable.		4.01	1.003
Electronic monitoring has reduced the need for manual checks.		3.82	1.130
<b>Mean</b>		<b>3.91</b>	

#### 4.1.2 Descriptive statistics for Excise Duty Compliance

Table 4 shows that for the statement Our company has registered as a taxpayer for all the taxes has a mean response of 3.79 (SD = 1.106), suggesting that respondents generally leaned toward agreement. For the item, our company pays taxes by the due date, the mean is 3.97 (SD = 0.787), showing that most respondents agreed with the statement. Similarly, our company files tax returns only to avoid penalties has a mean of 4.03 (SD = 0.787), indicating agreement. The statement Our company declares correct monthly excise duty has the highest mean (4.09, SD = 0.731), reflecting strong agreement. Finally, our company submits business tax returns by the due date, has a mean of 4.00 (SD = 0.475), demonstrating strong agreement. The composite mean of 4.00 across all items indicates that respondents generally agree with statements about excise duty compliance, with varying degrees of consistency in their responses.



**Table 4: Excise Duty Compliance**

	N	Mean	Std. Deviation
Our company has registered as a taxpayer for all the taxes	143	3.79	1.106
Our company pays taxes by the due date.		3.97	.787
Our company files tax returns only to avoid penalties.		4.03	.787
Our company declares the correct monthly excise duty.		4.09	.731
Our company submits business tax returns by the due date.		4.00	.475
<b>Mean</b>		<b>4.00</b>	

#### 4.2 Correlation Analysis

Table 5 presents the correlation analysis. The strength of the association between each predictor variable and the dependent variable was measured using Pearson's correlation coefficient. Two variables are more strongly linked in either direction if the relationship is closer to 1 or -1.(Azeez, 2020). Electronic monitoring has a significant and positive correlation with excise duty compliance ( $r = .501$ ,  $p\text{-value} = .030$ ). This suggests that real-time tracking mechanisms significantly enhance tax adherence, possibly by deterring fraud and ensuring accurate reporting.

**Table 5: Correlation Statistics**

	Excise duty compliance	Electronic monitoring
Excise duty compliance	1	0.501**
Electronic monitoring	0.501**	1
Sig.	0.030	

\*\* . Correlation is significant at the 0.05 level (2-tailed).

#### 4.3 Regression Analysis

The model summary showed the correlation R and the coefficient of determination R-squared. Table 6 showed that electronic monitoring correlated with excise duty compliance at 50.1%. The model summary further showed that electronic monitoring was responsible for 25.1 of % variance in excise duty compliance. The remaining 74.9% variation was caused by factors not included in the model.

**Table 1: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.501 <sup>a</sup>	.0251	.247	.35892

a. Predictors: (Constant), Electronic monitoring \_mean

The ANOVA results presented in Table 7 indicate that the F statistic of 350.044 and the p-value of  $0.000 < 0.05$ , which indicates that the model was significant in explaining the variance caused by Excise duty compliance.

**Table 7: ANOVA**

Model		Sum Squares	of df	Mean Square	F	Sig.
	Regression	35.044	1	35.044	350.044	0.000
1	Residual	14.117	141	0.100		
	Total	49.161	142			

a. Dependent Variable: Excise duty compliance

b. Predictors: (Constant) Electronic monitoring

**Table 8:** Standardized coefficients showed that electronic monitoring has a significant positive effect on excise duty compliance, with a standardized beta coefficient of ( $\beta = 0.232$ ,  $p = 0.014$ ). This indicates electronic monitoring caused a 0.232 increase in excise duty compliance. The study found that electronic monitoring had a positive and significant effect on excise duty compliance,  $\beta = 0.232$ ,  $p\text{-value} = 0.014 < 0.05$ . Consequently, the null hypothesis was rejected.

**Table 8: Regression Coefficient analysis**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.705	0.240		7.104	0.000
1	Electronic monitoring	0.232	0.093	0.221	2.495	0.014

a. Dependent Variable: Excise duty compliance

#### 4.4 Discussion of the Findings

The correlation matrix showed that electronic monitoring has a significant and positive correlation with excise duty compliance ( $r = .501$ ,  $p\text{-value} = .030$ ). This suggests that real-time tracking mechanisms significantly enhance tax adherence, possibly by deterring fraud and ensuring accurate reporting. The study found that a unit change in electronic monitoring systems caused a 0.232 increase in excise duty compliance ( $\beta = 0.232$ ,  $p = .014$ ). Suggesting

that real-time surveillance contributes to better tax adherence. Most studies align with the finding that electronic monitoring improves tax compliance. Mugambi (2021) found that Kenya's electronic monitoring system reduced cargo diversion and improved border efficiency.

## 5. Conclusion

The study sought to determine the effect of electronic monitoring on excise duty compliance. The findings conclude that real-time electronic surveillance significantly improves excise duty compliance by deterring fraud and ensuring accurate reporting. The null hypothesis (H02) was rejected. This study extends prior research by demonstrating how real-time monitoring technologies can be effectively implemented in excise tax administration, offering insights for policymakers on combating tax evasion.

## 6. Recommendations

Regarding electronic monitoring, the study demonstrates its effectiveness in improving excise duty compliance. The government should invest in integrated real-time tracking systems, including GPS and RFID technologies, for all high-risk excisable goods. Policies should also mandate electronic cargo monitoring for all transit goods to prevent diversion and smuggling at border points. Future research should investigate the effects of behavioral factors, such as tax morale and social norms, in shaping excise duty compliance attitudes.

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