EFFECTS OF VALUE ADDED TAX REFUNDS ON VOLUME OF EXPORTS BY THE KENYAN FIRMS

BY

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DECLARATION

This project is my original research work and has neither been presented nor submitted for a degree award in any other university or any other award.

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K102/27047/2014

I confirm that the work reported in this project was carried out by the candidate under my supervision

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DEDICATION

I dedicate this research project to my dear parents: Benard Omwenga and Hellen Kerubo, and my late grandparents: Zablon Omayio, Johnson Mayoyo, Peris Omayio and Veronica Nyamanyi who tirelessly reminded me that education is the only tree with bitter roots but bears sweet fruits.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

ADF	Augumented Dickey Fuller
COMESA	Common Market for East and Southern Africa
CPI	Consumer Price Index
EAC	East Africa Community
EFTA	European Free Trade Area
ETR	Electronic Tax Register
EU	European Union
FY	Financial Year
FDI	Foreign Direct Investment
FTO	Firms Turn-over
GDP	Gross Domestic Product
HS	Harmonized System
ICPAK	Institute of Certified Public Accountants of Kenya
IMF	International Monetary Fund
KNBS	Kenya National Bureau of Statistics
NSIS	National Security Intelligence Services
PwC	Price Waterhouse Coopers
REER	Real Effective Exchange Rate
SSA	Sub-Saharan Africa
TNT	The National Treasury
TOT	Turnover Tax
UNCTAD	United Nations Conference on Trade and Development
USA	United States of America
VAT	Value Added Tax
VATR	Value-added-tax rebates/refunds
WB	World Bank
WTO	World Trade Organization

OPERATIONAL DEFINITION OF TERMS

Exempt goods: This refers to non-taxable goods following financial Act enacted by the parliament.

Exports: This refers to the total value of goods and services sold to another country.

Export performance: This is the ratio of a country's exports to the gross domestic product at a given point in time.

Firms: These are economic entities that works for its profit motive and society as it shares in relation with the society as a whole either directly or indirectly.

Tax compliance: It refers to taxpayer registration, filing of returns, reporting and payment of due taxes.

Tax morale: It is the existence of an intrinsic motivation to pay taxes without coercion.

Tax rebate: This is a refund of taxes when the tax paid is more than tax liability.

Value Added Tax: This is a consumption-based tax that is levied at each stage of product's production and distribution.

VAT refunds: This refers to the difference between output tax and input tax that a business is entitled to a claim from the revenue authority.

Zero-rated goods: These products are currently subject to a zero percent tax rate even though they are solely taxable for value-added tax purposes. The government does not impose sales tax on zero-rated goods but does permit tax credits for input value-added taxes paid.

ABSTRACT

Value Added Tax (VAT) is a consumption-based tax that is levied at each stage of product's production and distribution. The long process of VAT refund and delays in refund payments arguably deprive export firms their working capital, which affects their operations, output and business profits. This may force export firms to alter their blend of production and/or reduce their export production. This study sought to look at how VAT refund affects the export performance of Kenyan firms. Specifically, the study sought to: estimate the effects of the payment of VAT refunds on export volume of firms in Kenya and establish the effects of time taken to pay the VAT refunds on export volume of firms in Kenya. The study utilised a non-experimental research design. The study employed unbalanced panel data consisting of 43 export firms observed at three different periods (2017, 2018 and 2019). The study was faced by missing data challenges thus firms included in the analysis are those that had data on dates of VAT refunds lodgments, approval and payments, VAT refund amounts; and at least three years' observations on exports performance. The study employed Pooled Ordinary Least Square (OLS) model in the analysis, with the second empirical model including the sector dummies to control for the sector specific characteristics to achieve the first objective. The descriptive analysis which was used to address the second objective shows that the average refunds paid by the Kenya Revenue Authority (KRA) to the firms during the three-year period was Kshs 33,542,610.80, with a minimum value of Kshs 1,000,221.77 and a maximum value of Kshs 423,899,228.03. Additionally, the descriptive statistics show that on average, it took five and a half months to verify the refund claims during the period. The shortest time taken to verify VAT refund claims was one month while the longest it took was 14 months. However, it took only one month to pay the VAT refund claims after they were verified. This means that the payment for VAT refunds is well provided for thus the challenge is with the time taken to verify the refund claims. The empirical models showed that payment of VAT refunds has a positive relationship with export performance, meaning that efficient payment of VAT refund is likely to lead to an increase in export performance in Kenya. Moreover, the results from both models also showed that delay in verification of the VAT refunds negatively affects export performance of the Kenyan firms. The study recommends a review of the 100% VAT refunds verification requirement to reduce the refunds claims verification period and VAT data cleaning to improve on the VAT refunds data quality for analyses to inform management decision making and also risk profiling of VAT taxpayers.

CHAPTER ONE

INTRODUCTION

1.1 Background

1.1.1 Exports of Kenyan firms

Many countries in the world including Kenya have shifted focus to export-led economic growth strategies (Were *et a*l., 2002). This calls for incentives to enhance exports by the Kenyan firms. With increased globalization as a result of liberal trade policies, Kenya needs to refocus its trade policies to enhance its competitive edge for it to realize long term aspirations of industrialization (Were et al., 2002). Like most countries in the sub-Saharan African (SSA) region, the export structure of Kenya largely consists of primary commodities besides tourism, which is very vulnerable to frequent fluctuations in world process thus destabilizing the export sector (Were et al., 2002). The main exports from Kenya include tea, coffee and horticultural products. Figure 1.1 shows Kenya's exports since 2010.

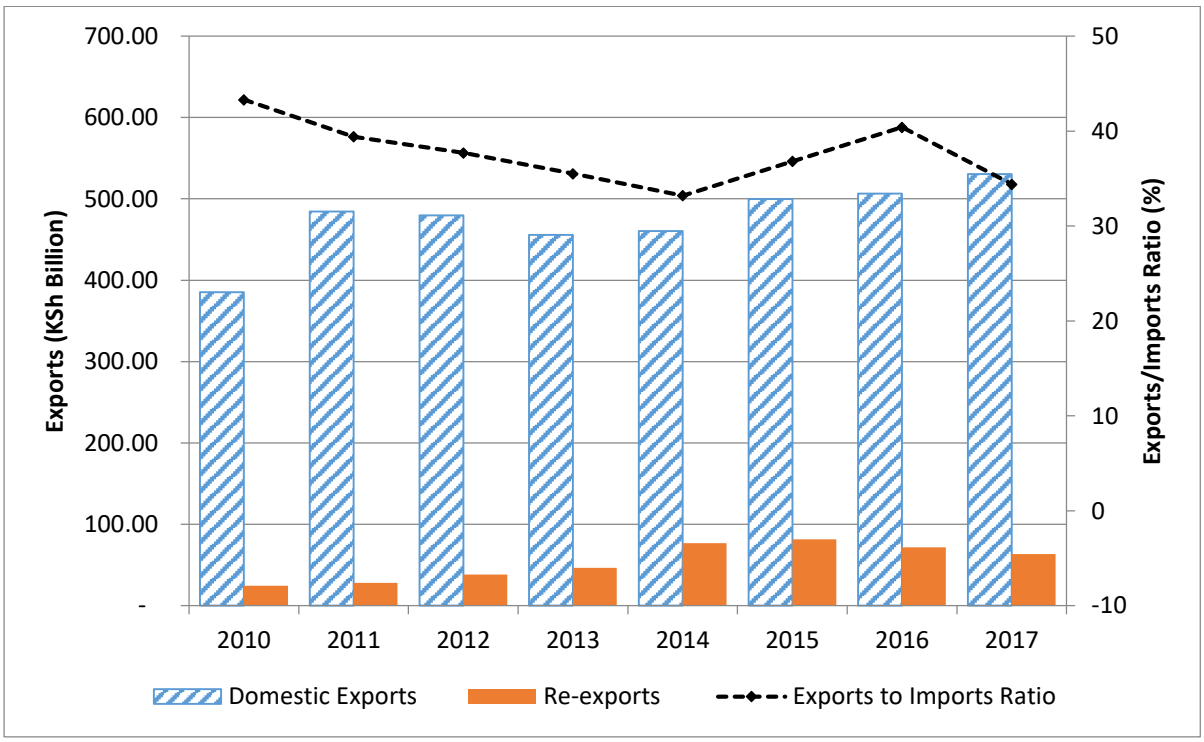

Figure 1.1: Kenya's Exports, 2010 - 2017

Source: Republic of Kenya (2018; 2014b)

The figure shows that Kenya's domestic exports have experienced a sluggish growth, rising from Kshs 385.4 billion in the year 2010 to Kshs 530.6 billion in the year 2017. But the re-exports have recorded some significant growth over the period, though this has been on a decline since 2015. The re-exports rose from Kshs 24.4 billion in 2010 to a high of Kshs 81.3 billion in 2015 before dropping to Kshs 63.5 billion in 2017. On average, the domestic exports grew by 5.1 percent annually during the period while the re-exports grew by 17.2 percent annually. The figure also demonstrates that the exports to imports ratios have generally been on a decline implying disproportionate increase in imports relative to exports. The ratio declined from 43.3 percent in 2010 to 33.2 percent in 2014. In 2017, Kenya reported an export to import ratio of 34.4 percent. These figures show the importance of the need to enhance Kenya's exports

The role of trade tax policies in boosting exports has always been a major subject of discussion. However, there has been unnoticeable focus on the potential effects of domestic tax policies (such as VAT tax policies) on exports. VAT is considered to be neutral in matters of international trade (Feldstein and Krugman, 1990) and thus expected not to affect the volume and composition of trade (Sharma, 2017). However, this neutrality relies on provision of VAT refunds to exporters thus efficient refunds management by the government is important. In most countries, businesses either do not continuously get VAT refunds they are entitled or do not receive them within expected timelines (Harrison and Krelove, 2005). Many countries tax imported goods and services to enhance competitiveness with the local products thus VAT refunds is expected to allow exported goods enter non-domestic markets at prices exclusive from tax. If a VAT system is imperfect, its effects on an industry will depend on the volume of intermediate goods in the industry. Consequently, such an imperfect VAT system would also possibly affect the composition of a country's exports (Sharma, 2017). As cited by Gourdon *et al*. (2014), Feldstein and Krugman (1990) showed that incomplete VAT refunds on exports

lead to taxes on exports resulting to reduced exports. The instant effect of a VAT refund reduction (in the absence of a pass-through effect) is a decline in profits expected by exporters, which may disincentive manufacturing firms to adjust their blend of production and therefore unable to orient their sales in the domestic market (Gourdon *et al*, 2014). Gourdon *et al*. (2014) point out that these responses may result to reduced export production thus affecting the aggregate exports performance of a country. It is therefore important to study if the imperfections in VAT refunds process influence Kenya's exports.

1.1.2 The VAT System in Kenya

Prior to VAT Act revision of 2009, taxable goods and services were categorized in eight schedules as shown in Table 1.1.

Table 1.1: Schedule for Value Added Tax in Kenya

First Schedule	• The first part specifies the general rate of tax which is 16 percent • The second part is on taxable services which are charged at 14 percent
Second Schedule	• This schedule covers exempt goods that are not taxable
Third Schedule	• The schedule covers non-taxable services (EXEMPT SERVICES)
Fourth Schedule	• Part one covers designated goods
	• Part one covers designated services-services that are not subject to turnover limits for registration.
Fifth Schedule	• Part A deals with zero-rated supplies • Part A deals with zero-rated goods
Sixth schedule	• The schedule covers procedures followed in registration and deregistration for VAT. It also includes changes once effected will affect registration.
Seventh Schedule	• The schedule entails return, invoices and records in relation to VAT
Eighth Schedule	• The schedule has three parts dealing with zero-rating requirements for public bodies, special goods and persons who have diplomatic privileges.

Source: KRA (2011)

The review of VAT Act ,2013 was coincidental with a reversal in declining trend of VAT revenues. Specifically, the amendments were meant to reduce VAT refunds backlog, cut on revenue administrative costs and boost the cash flow of taxpayers (Republic of Kenya, 2014a). This new VAT Law was necessitated by the challenges the government and the business community were facing in the implementation of VAT Act.

Table 1.2: Classification of Goods and Services

Status	VAT Rate	Examples
Exempt	No VAT	Suppliers cannot claim VAT Examples are: ▪ Insurance services ▪ Financial services ▪ Unprocessed agricultural produce
Zero-rated	0%	Suppliers can claim input VAT Examples are: ▪ Export of goods or taxable services
Standard rated	16%	Suppliers can claim input VAT Examples are: ▪ Other taxable supplies

Source: ICPAK (2015)

Table 1.2 presents the classification of goods and services following VAT Amendment Act of 2013. Some provisions were repealed while new ones were introduced. Some of these changes included the removal of both VAT remission and the reversal of VAT rate of 12 percent. Also, the schedules were reduced from eight to two. The previous subsidiary legislation was also incorporated as a principal legislation (Republic of Kenya, 2017). In addition to this, previously zero-rated and exempt supplies were also brought into tax charge. This reduced the number of companies claiming a tax refund for producing zero-rated goods. To streamline tax administration and clear the backlog of refunds, the number of tax-exempt items was lowered from 400 to 27.

Following the enactment of VAT Act of 2013 and filing of VAT returns through *i-tax*, collection of VAT revenue increased from 4.1 as a proportion of GDP in FY 2013/14 to 4.6 percent in the FY 2015/2016. The introduction of i-tax system in 2014 saw the VAT collections grew at a faster rate than the total final private consumption. This can be attributed to efficiency of VAT collection following automation of processes. In every financial year, The National Treasury allocates money to KRA to cater for VAT refunds. The National Treasury allocated 3.13 percent of GDP in 2015 to cater for tax expenditure on VAT. KRA intends to scrap some

of the exemptions to VAT regime with the intention of improving VAT outcomes in the country (Republic of Kenya, 2016).

1.1.3 Value Added Tax Refunds

Refunds are part and parcel of the operations of VAT system. VAT is a tax that is designed to be borne by the final consumer, not producers or suppliers. Claims for tax refunds mainly result from the invoice-credit form in which some businesses (such as exporters whose export sales are zero-rated) pay more value-added-tax on their business purchases than total collections on taxable sales (Harrison & Krelove, 2005). Also businesses, especially new businesses, which make large purchases relative to current sales tend to have VAT refund claims.

One of the areas with notable changes in the Kenya's FY 2015/2016 National Budget, which had not been provided for in VAT Act 2013, was the amendment to Section 17 of VAT Act which touches on tax refunds. With regards to bad debts, one can make an application for refund within three to five years from the date of supply. Tax refunds done in error should be refunded to the Commissioner within 30 days of service of demand. Failure to comply attracts a two percent interest. From Table 1.2, it is evident that exports are the main benefactors of tax refunds. Unfortunately, upon the introduction of tax refunds, KRA continues to grapple with the challenge of unpaid VAT refunds. This has led to complains from the business community in view of the negative effect on their cash flow due to such business entities remitting more VAT than they are liable (Anyanzwa, 2014). It is also worthwhile noting that by the close of FY2012/13, KRA was struggling to refund approximately $330 million (Kshs 33 billion).

The Government of Kenya first introduced withholding VAT in 2003 to enhance compliance of taxpayers in regard to payments. Ideally, withholding VAT is not an additional tax head by the Authority but a way of facilitating VAT collections. A fraction of VAT is collected by tax agents who are expected to withhold payments made by businesses in relation to goods and

services which should be taxed locally. The withholding VAT agents include government departments and ministries, state corporations, county (devolved) governments, financial institutions, cooperative societies, hospitals, banks, and insurance brokers. The withholding tax is placed at six percent and the business person is paid 10 percent of the remaining VAT. Further, the law requires the withholding VAT agents to remit to the Authority the withheld tax within 14 days from the date the tax amount was withheld. The sixteen percent VAT rate- which has now been reduced to fourteen percent- compounded with delay in VAT refunds has created a cash flow constraint among the majority of VAT taxpayers. This has increased the portion of contingent liabilities for The National Treasury (TNT). With the exclusion of backlogs, VAT refunds have reached an average of Kenya shillings five billion per month. Even though there have been changes, the business community remains concerned about delays in obtaining VAT refunds. For example, Irungu (2013) pointed out that traders had to resort to debts due to delays in VAT refunds. The amounts of VAT refunds paid by KRA have not been sufficient over the years compared to claims lodged by the suppliers. This has affected the volume of exports by the Kenyan firms as shown in Figure 1.2.

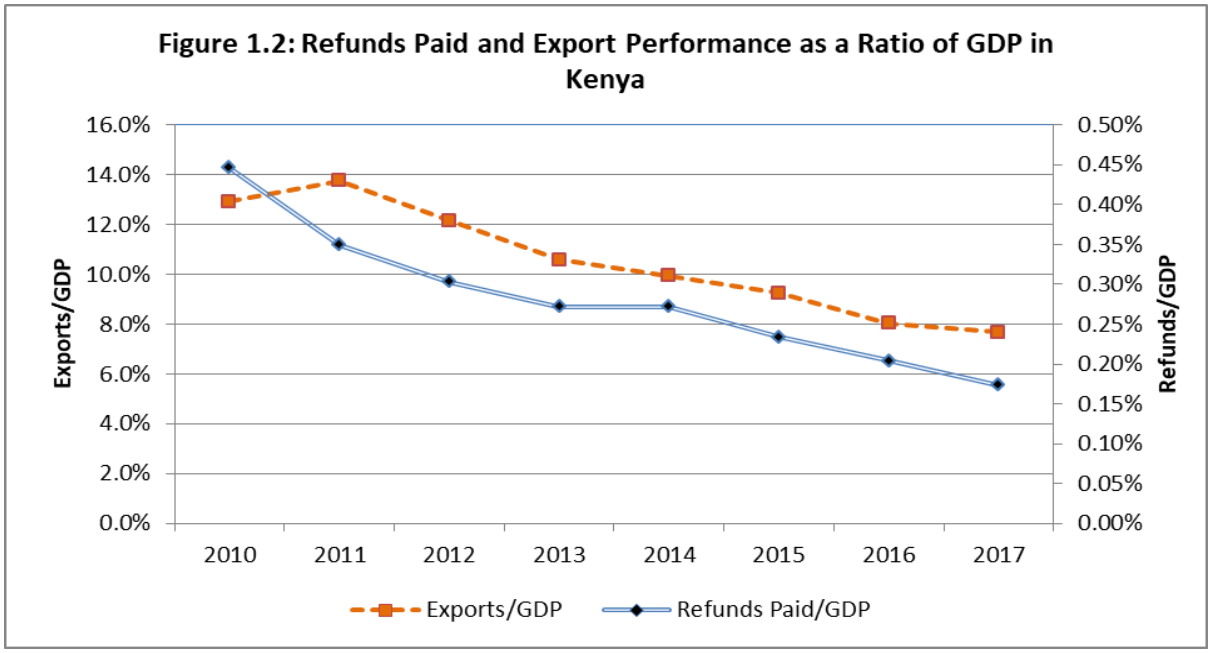

Figure 1.2: Refunds Paid and Exports Performance as a Ratio of GDP in Kenya

Source: KRA (2020); KNBS Economics Survey,2020

The figure shows that ratio of refunds payments to GDP and ratio exports to GDP have been on a declining trend since 2011. The imperfections in VAT refunds process deny the exporters the much needed capital and liquidity thus influence their supply of exports. The imperfections of VAT refunds process are as a result of fraudulent claims by businesses and insufficient allocation of refunds by The National Treasury. The implication of this is that several firms' working capital are held up by the government thus constraining their cash flows and possible re-investments. This study sought to examine this relationship to understand the effects of VAT refunds on Kenya's exports.

1.2 Statement of the Problem

VAT in principle is considered to be neutral in the matters of international trade (Feldstein and Krugman, 1990). It is expected not to affect the volume and composition of trade (Sharma, 2017). However, this neutrality relies on provision of VAT refunds to exporters and the refunds management by the government. In most countries, businesses either do not continually get the refunds they are entitled to or do not receive them within the expected time (Harrison and Krelove, 2005). The management of refunds on VAT has been a source of several taxpayers' complaints leading to mistrust between them and their tax authorities. Theoretically, VAT refunds should be given right away after filing a VAT return, resulting in an excess credit. However, in practice, VAT refunds process by the government is labor-intensive in terms of claims verification and takes long period before effecting payment.

In Kenya, VAT collections are sent to the National Treasury, which then allocates funds for settling VAT refunds for a specified fiscal year. The Kenyan refund program operates on the principle of 100 percent verification, and does not use a risk management process (World Bank, 2017). The long VAT refund process and the delay in refund payments arguably deprive export firms their working capital, which could be affecting their operations, output and profits in the export market. The imperfections in VAT refunds policy and process may result in a fall in

exporters' profits, especially for a small country like Kenya that cannot pass it through to international prices. This may force manufacturers to reduce their export production and in some instances change production blends. It is against this backdrop that this study sought to examine how the VAT refund affects the exports of firms in Kenya and identify the best practices in handling the declining proportion of VAT refunds on exports from 0.45 percent of GDP in 2010 to 0.17 percent in 2017.

1.3 Research Questions

This study sought to address to the following study questions;

i. How does payment of VAT refunds affect exports volumes of firms in Kenya?
ii. What is the effects of time taken to verify and pay the VAT refunds on exports volumes of firms in Kenya?

1.4 Study Objectives

Generally, the objective of this is to estimate effects of VAT refunds on export volume by the Kenyan firms. The study will specifically focus to:

i. Estimate the effects of the payment of VAT refunds on exports volumes of firms in Kenya; and
ii. Establish the effects of time taken to verify and pay VAT refunds on exports volumes of firms in Kenya.

1.5 Significance of the Study

There is need for a clear understanding of how VAT refunds affect Kenya's exports to inform designing of policies that cushion businesses and exports from financial constraints. In addition, this study will form a green pasture for future scholars to evaluate policy implications of VAT changes in the tax laws. The consumers of this study findings include firms in export business, the Kenya Revenue Authority and The National Treasury.

1.6 Scope of the study

Gross VAT refunds comprises of normal VAT refunds, VAT refunds on exports and withholding VAT refunds. Gross VAT collections emanates from imports VAT collections or domestic VAT collections. The study focussed on Gross VAT collections and VAT refunds with special emphasis on VAT refunds effect on exports.

1.7 Organisation of the Study

The study is organised as follows: chapter one (background of the study); the second chapter (literature review); chapter three (methodology); chapter four (empirical findings) and chapter five (summary, conclusion and recommendations).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section presents theoretical and empirical literature reviewed in this study.

2.2 Theoretical Literature

2.2.1 Principle of Political Economy and Taxation

Ricardo (1817) argued that an increase in raw material price would have an effect on the prices of all commodities produced from it in equal proportion, but there would be a variation on the effects since the value of the commodities are made up of different proportions of raw material and labor. He further noted that this effect would motivate or impede the exportation of specific commodities, and would certainly impair the natural relation between the values of the commodities. This would impliedly not place the country under any comparative disadvantage with regards to competition in foreign markets.

2.2.2 International Competitiveness Trade Theory

This theory argues that VAT as a consumption tax would not impose the prejudice against saving and thus help to promote economic growth through capital formation. Businesses view VAT as a necessary aid to international competitiveness since value added tax is levied on imports but exports are allowed tax rebates. This means that producers of exports are supposed to pay income tax but foreign producers of the imported goods are not liable to pay it. Proponents of this theory allude that countries that have VAT tend to have an added advantage in international competition as compared to countries that rely on income taxation. Feldstein and Krugman (1990) theoretically showed that incomplete VAT rebates or refunds (VATR) mostly makes VAT act as an exports tax in situations where it is equal to VAT charged less VATR. The export tax usually reduces as VATR increases, thus presenting a positive relationship between VATR and trade exports.

2.2.3 Theory of the Firm

Firms use different intermediate goods to come up with the final products which are mostly identified with price taking behavior and perfect competition. The norm of economists around the world is to model the profit maximization objective of the firm. Firms in the export market opt to maximize profits by increasing output and minimizing costs.

According to Wang &Anwar (2019) a firm can be thought of having a Cobb-Douglas production function specified as:

$$Y_t = \left[\int_0^1 Y_{j,t}^{\frac{\varepsilon-1}{\varepsilon}} \right]^{\frac{\varepsilon}{\varepsilon-1}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2.1)$$

Where Y_t represents final good at time t, $Y_{j,t}$ is j-th intermediate commodity, the ε is the elasticity of substitution between the intermediate goods.

A representative firm whose objective is to maximize profits with $P_{j,t}$ as the price of the intermediate products and P_t given as the price of the final product can be represented as follows:

$$\underset{y_{j,t}}{Max}\prod\nolimits_t = P_t Y_t - \int_0^1 P_{j,t} Y_{j,t}\, dj \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2.2)$$

In Kenya, exporting firms are allowed to claim VAT refunds based on the difference between input and output tax. Impliedly, equation (2.2) will be stated as follows:

$$\max_{Y_{j,t}} \prod\nolimits_t = P_t Y_t - \left| \frac{\gamma}{1+\gamma} P_t Y_t - \gamma \int_0^1 P_{j,t} Y_{j,t}\, dj \right| + \frac{s}{1+\gamma} P_t Y_t - (1+\gamma) \int_0^1 P_{j,t} Y_{j,t}\, dj ..(2.3)$$

Where ϒ is the rate of VAT in the production process,

$-\left|\frac{\gamma}{1+\gamma}P_tY_t-\gamma\int_0^1 P_{j,t}Y_{j,t}dj\right\|+\frac{s}{1+\gamma}P_tY_t\Big|..\Big|$ is the difference generated by VAT refunds,

$\frac{s}{1+\gamma}P_tY_t$ denotes the amount of VAT refunds to the firms,

$\left|\frac{\gamma}{1+\gamma}P_tY_t-\gamma\int_0^1 P_{j,t}Y_{j,t}dj\right|$ is the computed difference between output and input tax,

For firms to lodge VAT refunds, output tax is assumed to be more than input tax and this implies that:

$$\frac{\gamma}{1+\gamma}P_tY_t-\gamma\int_0^1 P_{j,t}Y_{j,t}dj>0$$

Equation (2.2) can also be written as:

$$\max_{Y_{j,t}}\prod_t=\frac{1+s}{1+\gamma}P_tY_t-\int_0^1 P_{j,t}Y_{j,t}dj \quad \text{.....(2.4)}$$

The exports from Kenya are assumed to be stable which implies that foreign aggregate demand (C) is fixed and total demand of Kenyan exports in the international market is assumed to be greater or equal to total export supply of domestic goods. This can be demonstrated as:

$$P_t.Y_t\le C \quad \text{.....(2.5)}$$

A non-linear dynamic system can be obtained from equations (2.4) and (2.5) which is stated as:

$$\max_{Y_{j,s}}\prod_t=\frac{1+s}{1+\gamma}.P_tY_t-\int_0^1 P_{j,t}Y_{j,t}dj \quad \text{.....(2.6)}$$

Subject to $P_t.Y_t\le C$

The equivalent Lagrange function (A) is stated as :

$$A = \frac{1+s}{1+\gamma} P_t Y_t - \int_0^1 P_{j,t} Y_{j,t}\, dj + \lambda(C - P_t Y_t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.7)$$

Using the Kuhn-Tucker Theorem, the 1st order conditions can be obtained as follows:

$$\frac{\delta A}{\delta Y_{j,t}} = \left[\frac{1+s}{1+\gamma} - \lambda\right] \cdot P_t \cdot \left[\int_0^1 Y_{j,t}^{\frac{\varepsilon-1}{\varepsilon} dj}\right]^{\left(\frac{\varepsilon}{\varepsilon-1}-1\right)} \cdot Y_{j,t}^{\left(\frac{\varepsilon-1}{\varepsilon}-1\right)} - P_{j,t} \le 0, Y_{j,t} \ge 0, Y_{j,t} \cdot \frac{\delta A}{\delta Y_{j,t}} = 0 \ldots\ldots\ldots (2.8)$$

$$\frac{\delta A}{\delta \lambda} = C - P_t Y_t \ge 0, \lambda \ge 0, \lambda . \frac{\delta A}{\delta \lambda} = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.9)$$

Marginal profits of exporting firms can be equated to marginal cost of the firms if $Y_{j,t}>0$

The marginal costs of exporting firms is given by:

$$\frac{\delta A}{\delta Y_{j,t}} = 0$$

From equation (2.9), if $\lambda > 0$, all resources will be completely utilized.

$\frac{\delta A}{\delta \lambda} = C - P_t y_t = 0 \ldots\ldots\ldots (2.10)$, this implies that $P_t Y_t = C$

But since $Y_{j,t}>0$, the first order condition can be derived as follows:

$$\frac{\delta A}{\delta Y_{j,t}} = \left[\frac{s-\lambda}{1+\gamma}\right] P_t \cdot \left[\int_0^1 Y_{j,t}^{\frac{\varepsilon-1}{\varepsilon}} dj\right]^{\left(\frac{\varepsilon}{\varepsilon-1}-1\right)} \cdot Y_{j,t}^{\left(\frac{\varepsilon-1}{\varepsilon}-1\right)} - P_{j,t} = 0 \ldots\ldots\ldots\ldots\ldots\ldots (2.11)$$

Equation (2.11) holds for intermediate products i and j.

Equation 2.12 is the integral of the intermediate goods j:

$$\int_0^1 P_{j,t} Y_{j,t}\, dj = P_{i,t} Y_{i,t}^{\frac{1}{\varepsilon}} \cdot \int_0^1 Y_{j,t}^{\frac{\varepsilon-1}{\varepsilon}} dj \ldots\ldots\ldots\ldots\ldots\ldots (2.12)$$

In competitive markets, the assumption of no barriers to entry implies that there will be zero profits in the long run. Combining equation (2.12) with the zero-profit condition, we shall have,

$$\frac{1+s}{1+\gamma}\cdot P_t Y_t = P_{i,t} Y_{i,t}^{\frac{1}{\varepsilon}} \cdot \int_0^1 Y_{j,t}^{\frac{\varepsilon-1}{\varepsilon}} dj \quad \text{.....(2.13)}$$

We can rewrite equation (2.13) as follows:

$$Y_t = \left(\frac{1+\gamma}{1+s}\right)^{\varepsilon} \cdot \left(\frac{P_{i,t}}{P_t}\right)^{\varepsilon} \cdot Y_{i,t} \quad \text{.....(2.14)}$$

Equation (2.14) indicates that the demand for an intermediate good usually decreases in relative prices of the intermediate commodities but assumes a non-decreasing trend in the final output of good (i).

Summation of all intermediate goods will lead to:

$$Y_t = \left(\frac{1+\gamma}{1+s}\right)^{\varepsilon} \cdot P_t^{-\varepsilon} \cdot \int_0^1 P_{i,t}^{\varepsilon} Y_{i,t}\, di \quad \text{.....(2.15)}$$

Combining equations (2.14) and (2.15), the relationship between intermediate goods prices and the export price of final products is stated below:

$$P_t = \left(\frac{1+\gamma}{1+s}\right) \cdot \left[\int_0^1 P_{i,t}^{\varepsilon} Y_{i,t}\, di\right]^{\frac{1}{\varepsilon}} \cdot \left[\int_0^1 Y_{i,t}^{\frac{\varepsilon-1}{\varepsilon}} di\right]^{\frac{1}{1-\varepsilon}} \quad \text{.....(2.16)}$$

Equation (2.16) indicates an inverse relationship between price of final export goods and the rate of VAT refunds (s).

The relationship between VAT refunds rate and exports can be expressed as:

$$Q_t = Y_t * P_t \quad \text{.....(2.17)}$$

Replacing equation (2.14) and equation (2.16) into equation (2.17),

$$Q_t = \frac{1+\gamma}{1+s} * P_{i,t}^{\varepsilon} * \left[\int_0^1 P_{i,t}^{\varepsilon} Y_{i,t}\, dj \right]^{\frac{1-\varepsilon}{\varepsilon}} * \int_0^1 Y_{i,t}^{\frac{1-\varepsilon}{\varepsilon}} dj \quad \text{.....(2.18)}$$

Differentiating equation (2.18),

$$\frac{\partial Q_t}{\partial s} = -\frac{1+\gamma}{(1+s)^2} * \phi_{i,t} \quad \text{.....(2.19)},$$

Where Q_t represents the total export volume of the representative firm,

$$\phi_{i,t} = P_{i,t}^{\varepsilon} * \left[\int_0^1 P_{i,t}^{\varepsilon-1} dj \right]^{1-\varepsilon} * Y_{i,t}$$

It is very clear from equation (2.19) that the exports of the representative firms have inverse relationship with the VAT refund rate. This means with a government decision to increase VAT refunds rate would lead to a decrease in the quantities of exports.

The theory indicates that a rise in VAT refunds reduces both firm exports and prices.

Equation (2.18) is the basis on which the theoretical model used in the study to address the study objectives.

2.3 Empirical Literature Review

2.3.1 VAT Refunds/Rebates and Exports

Braakmann et al. (2017) carried out a study to understand how VATR adjustments affect export price, quantity, number of firms and destinations of Chinese exports. Braakmann et al. (2017) used VATR as a novel instrument of price to identify the export demand elasticity and argued that in their framework, VATR adjustment will shift the supply but not shift demand conditional on the fixed effects. The study constructed export price as unit value, that is, export revenue divided by export quantity as commonly used in literature. Braakmann et al. (undated) corrected for the endogeneity that VATR adjustments may be responses to export shocks and restricted the sample from January 2005 to December 2006, the period without a relevant

economic crisis in the world market. The study found out that, in overall, one percentage point decrease of VATR raises export price by 21%, and that VATR effect on price is negatively related to market competition, but positively related to multinational production. The study showed that the export quantity reduced by 24%, indicating 3% decrease of export value. Using difference-in-difference approach, Braakmann *et al*. (2017) found out that the decrease of VATR significantly reduces the number of firms exporting the adjusted product and destinations the product exported right after the ETR adjustment. The study also argued that VATR adjustment shifts supply curve, but not demand curve, thus could be used as an instrument to estimate export demand elasticity.

Most of the studies on effect of VAT rebates or refunds (VATR) on exports have been carried out on China where VATR is widely used as a trade policy. Compared to the most developed nations, the value-added tax system of China is not impartial since it makes it more beneficial to sell a product domestically than to export it (Gourdon *et al*., 2014). In China, goods exported to other countries attract refunds from full or part of the paid VAT by businesses during the process of production, distribution and sales.

Therefore, VATR is a usually applied in export-promoting policy by Chinese government that was introduced to the fiscal system in April 1985. Liang (2014) studied the effect of VAT refunds on exports in China. In the study, Liang (2014) noted that strengthening competitiveness of local products and thus extending export was the most vital function of tax refunds on business exports. Since the enactment of business export tax refund in China in 1985, the country's export grew at a faster rate. Liang (2014) showed that apart from the years 1996, 1998 and 2009, the average yearly growth rate of China's export exceeded 10 percent in the 1990s and 2000s. The study also noted that the dependence level of China's economy on trade export was approximated at 9.0 percent in 1985 but this increased to 47 percent in 2012. It was estimated that China's economy would expand by 0.3 percent in case the refund rate

was increased by one percent. Liang (2014) pointed out that the export tax refund policies were also used as a device for controlling the macro-economy.

Wang & Anwar (2019) studied the link between VAT rebate policy and export performance of mechanical products. Empirical analysis of the panel data showed that VAT rebate has a significant negative effect on China's mechanical goods export. On average, a one percentage point increase in VAT rebate rate decreases the exports by 2.07 percent. Further testing showed that the empirical results are robust. These results do not necessarily suggest inefficiency of China's VAT rebate policy. The study recommended a further research suing a longer time series is needed to examine the effectiveness of the VAT rebate policy on other sectors.

2.3.2 Determinants of Exports Performance

Were *et al*. (2002) examined the factors that have influenced Kenya's export. Were *et al.* (2002) found out that real exchange rate profoundly influenced exports. Investment as a share of GDP had a significant (and positive) impact on the firms export trade quantities of only coffee but not for other trade export of goods and services. Income of trading partners was found to be vital in elucidating export volumes of 'other exports of goods and services' than agricultural coffee exports. With increased trade liberalization around the world, some sub-sectors (that is horticulture and to some extent manufacturing and tourism) seem to have thrived while others like the coffee sub-sector have stifled, partly due to increased costs of inputs resulting from market liberalisation.

Using a disequilibrium model of agricultural crop export, Maugu et al. (2013) looked at the factors that affected Kenya's supply of agricultural crop exports between 1963 and 2012. The study found that while coffee exports were not significantly influenced by the real exchange rate, exports of tea, pyrethrum, and horticulture were. It was discovered that productivity, as measured by GDP, was a key factor in determining coffee, tea, and total exports. Coffee exports

were significantly impacted by El Nino rainfall, as measured by a dummy, whereas trade liberalization was only significantly impacted by pyrethrum exports.

Chirchir *et al.* (2017) examined the effect of exchange rate volatility and selected microeconomic variables on exports. An increase in the shilling exchange rate volatility led to a more than proportionate decrease in demand for tea exports volumes from Kenya to the main five importers. The findings further explained that this meant that tea exporters in Kenya are risk averse and with an increase in exchange rate volatility exporters would tend to reduce their exports in order to reduce their risk exposure.

Epaphra (2016) examined the determinants of exports in Tanzania using time series data for the 1966-2015 period. The empirical model included real per capita GDP, inflation rate (measured as the growth rate of consumer price index and used as a proxy of macroeconomic stability), VAT dummy, trade liberalization (proxied by share of trade in GDP), real exchange rate, and official development assistance on total export as a percent of GDP. The results showed that all the variables included in the model influenced exports in Tanzania.

2.4 Summary of Literature

The study focussed on three main theories namely Principle of Political Economy and Taxation, International Competitiveness Trade Theory and Theory of the Firm. The theory on Principle of Political Economy and Taxation argues that that an increase in raw material price would have an effect on the prices of all commodities produced from it in equal proportion, but there would be a variation on the effects since the value of the commodities are made up of different proportions of raw material and labor. According to the International Competitive Trade Theory, VAT as a consumption tax would not impose the prejudice against saving and thus help to promote economic growth through capital formation. The Theory of the firm argues that a government decision to increase VAT refunds rate would lead to a decrease in the quantities of exports. Most of the empirical studies on effect of VAT rebates or refunds (VATR)

on export have focused on China. This is because the VAT system in China is considered to be impartial as exported products attract refunds with full or part of the paid VAT during the process of production of goods, distribution channel and sales to final consumers. This study seeks to fill this study gap by concentrating on a country with neutral VAT system but with imperfections in VAT refunds processing leading to delays in paying the VAT refunds, which denies export firms part of their working capital.

The literature reviewed also highlights the factors that have been found to influence exports in a number of countries. These factors include: real exchange rate, trade liberalization, external demand (foreign national income of trading partners), access to credit, labour costs, costs of intermediate inputs, domestic economy productive capacity (GDP or investment), trade promotion policies, VAT refunds adjustments, domestic inflation rates, access to foreign markets, transport infrastructure development, contribution of Foreign Direct Investment (FDI) to capital formation, and institutional quality among others.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter focused on the research design, the theoretical framework, the theoretical model, the empirical model, measurement of variables and data analysis.

3.2 Research Design

The study employed a non-experimental research design. It involved desk review of available literature on the subject matter and made use of the available secondary data from KRA to carry out an empirical analysis of the effects of VAT refunds on Kenya's exports. The study employed the available data on VAT refunds, Customs data on exports and iTax data on returns of exports firms in Kenya. Pooled OLS regression will be used in the panel data analysis.

3.3 Theoretical Model

The study focussed on the theory of the firm as presented in the theoretical literature to formulate the theoretical model. The theory of the firm as used in this study assumes that aggregate exports are essentially stable. The study borrowed heavily from the theory of firm which was borrowed from Wang & Anwar (2019) study on whether VAT rebate policy stimulate performance of mechanical trade exports. Analysis of VAT refunds effect on representative firms' exports will be modelled under the theory of the firm framework.

The theoretical model used in this study was borrowed from Braakmann *et al.* (2017), which was specified as follows:

$$lnX_{ijdt} = \Omega_2 \, lnVATR_{ijt} + \varphi_{ij} + \varphi_{dt} + \mathcal{E}_{ijdt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(3.1)}$$

Where:

lnX_{ijdt} is the export value logarithm of good *i* exported by firm *j* to destination country *d* at time *t*

$lnVATR_{it}$ is log of VAT refund provided to firm *j* producing good *i* at time *t*

φ_{ij} is the fixed effect of the product-firm, which is used to control for the time-invariant firm, product and industry attributes

φ_{dt} is country destination-time fixed effect, which is used to control for the prevailing economic circumstances of the foreign markets (such as foreign aggregate demand parameters and exchange rate fluctuations)

3.4 Empirical Model

The study made use of the available firm-specific micro data on VAT refunds and exports performance. Since in Kenya VAT refunds are aggregated and paid per firm but not per transaction, this study modified the above model and employed the following empirical model:

$$LnExport_{jdt} = \beta_1\, LnRefund_{jt} + \beta_2\, RefundV_{jt} + \beta_3\, RefundP_{jt} + \beta_4\, LnFTO_{jt} + \beta_5\, LnGDPC_{djt} + \beta_6\, LnREER_{djt} + \sum \pi_i\, Sectordummy_{jt\ .} + \mathcal{E}_{jdt} \ldots\ldots (3.2)$$

Where:

j represents a firm (the cross-sectional units)

d represents destination country

t represents time period (2017, 2018 and 2019)

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \pi_i$ are the coefficients to be estimated

$LnExport_{jdt}$ is the logarithm of value of goods exported by firm *j* to country destination *d* at time *t*

$LnRefund_{jt}$ is logarithm of VAT refund paid to firm *j* at time *t*

$RefundV_{jt}$ is the time taken (in months) to verify VAT refund claims by firm *j* at time *t*

$RefundP_{jt}$ is the time taken (in months) to pay VAT refunds to firm *j* after verifying the claims

$LnFTO_{jt}$ is the logarithm of annual turnover of firm *j* at time *t*

$LnGDPC_{djt}$ is the logarithm of GDP per capita of destination country *d* where firm *j* sold its exports at time *t*

$LnREER_{djt}$ is the logarithm of Real Effective Exchange Rate of destination country *d* where firm *j* sold its exports at time *t*

$Sectordummy_{jt}$ is a dummy used to capture sector specific characteristics. The sectors include Horticultural sector, Agricultural sector (Crop and Animal Products), Manufacturing sector and Mining Sector

$\mathcal{E}$ is the error term

3.5 Measurement of Variables and Data Sources

This section indicates how each of the variables included in the model were measured and the respective sources of the data.

Table 3.1: Measurement of Variables

Variable	Measurement of variables	Expected Coefficient
Exports (Export)	Measured by the value of exports of goods by firm *j* in period *t*, reported in Kenya Shillings (Kshs), converted to US $ using the annual average exchange rate of Kshs to US $ for each year)	
Refund Paid (*Refund*)	Measured by the amount of VAT refunds paid to firm *j* in period *t*, reported in Kenya Shillings (Kshs), converted to US $ using the annual average exchange rate of Kshs to US $ for each year).	+
Refund Verification Period (RefundV)	Used to capture the time taken in verifying the refund claims. Measured by the number of months taken from date of lodgment of claims to when the claims are approved.	-
Refund Payment Period (*RefundP*)	Used to capture delays in refund payments. Measured by the number of months taken to pay the VAT refunds after the refund claims have been verified and approved	-
Firm Turnover (*FTO*)	Measured by the annual turnover of the export firm *j* in period *t*, reported in Kenya Shillings (Kshs), converted to US $ using the annual average exchange rate of Kshs to US $ for each year)	+
Destination Country's GDP per Capita (*GDPC*)	Measured by the GDP per capita of the main destination country of exports from firm *j* in period *t*, reported in current prices (US $) by the World Bank	+
Real Effective Exchange Rate for the Destination Country (*REER*)	Measured by Consumer Price Index (CPI)-based REER reported by UNCTAD.	-

Dummy for Horticultural sector (H)	Assumes the value of one for those firms in the horticultural sector, and zero for firms not in the horticultural sector.	+/-
Dummy for Agricultural sector (Crop and Animal Products) (A)	Takes the value of 1 for a firm in the Agricultural sector (crop and animal Products) sector, and zero otherwise	+/-
Dummy for Manufacturing sector (Ma)	Takes the value of 1 for a firm in the manufacturing sector, and zero otherwise	+/-
Dummy for Mining sector (Ma)	Takes the value of 1 for a firm in the mining sector, and zero otherwise	+/-

Source: Authors (2023)

Data on VAT refunds and period was obtained from Domestic Tax Department (DTD), Refunds Section. Data on exports and firm turnovers was extracted from the KRA's iTax system. Data on destination country's GDP per capita was sourced from the World Economic Indicators statistics. The final dataset employed in the analysis was arrived at by eliminating the cross-sectional units with incomplete data on the key variables. Therefore, the 43 firms included in the analysis are those that had data on: date of VAT refunds lodgments, approval and payments; VAT refund amounts; and at least two years' observations on exports performance for the period spanning 2017 to 2019.

3.6 Data Analysis and Diagnostic Tests

Augmented Dickey Fuller (ADF) Fisher, Levin, Lin and Chu (2002) (LLC), and Im, Pesaran and Shin (2003) (IPS) were conducted in testing for panel unit root tests. Panel level heteroskedasticity was tested using the modified Wald test with the null hypothesis states that there is homoscedasticity in the panels. The test for contemporaneous correlation was conducted by the Pesaran's (2004) test of cross-sectional independence in which the null hypothesis states that the residuals are not correlated across entities.

The random effects test was used to choose between the random effect model and pooled OLS model in case random effect model is selected over the fixed effects model after running the Hausman test in the first step (Greene, 2012).

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

The chapter highlights descriptive statistics, diagnostic test results, selection of the regression model and discussion of the empirical results. The final data employed in the analysis was arrived at by eliminating the cross-sectional units with incomplete data on the key variables. Therefore, the 43 firms included in the analysis are those that had data on: date of VAT refunds lodgments, approval and payments; VAT refund amounts; and at least two years' observations on exports performance for the period spanning 2017 to 2019.

4.2 Descriptive Statistics

The summary statistics for the main variables used to estimate the effect of VAT refunds on volume of exports by Kenyan firms and establish the effect of time taken to verify and pay VAT refunds on exports of firms in Kenya are presented in Table 4.1. The panel data is unbalanced and consists of 43 export firms (n), observed at three different periods (T).

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
Export Values (US $)	133,098.3	13,629.7	43,061.8	164,421.3
Refund Paid (US $)	324,688.0	716,097.5	10,650.0	4,103,288.0
Refund Verification Period (Months)	5.5	5.6	1	14
Refund Payment Period (Months)	1	0	1	1
Main Destination's GDP per Capita (Current US$)	25,707.1	26,226.2	444.4	82,016.0
Real Effective Exchange Rate for the Destination Country	107.8	13.2	95.9	128.2

Source: Author (2023)

Table 4.1 shows the mean, the standard deviation, and the minimum and maximum values for exports, refund paid, refund verification period, refund payment period, main destination country's GDP per capita and the real effective exchange rate for the destination country. On average, the value of exports by the firms is US$ 133.1 thousand (Kshs 13.75 million) and the GDP per Capital of the main destination countries is US$ 25.7 thousand (Kshs 2.7 million).

The minimum export values by the firms is US$ 43.0618 thousand (Kshs 4.448 million) and the GDP per Capital of the main destination countries is US$ 444.4 (Kshs 0. 04591 million). On the other hand, the maximum export values by the firms is US$ 164.421 thousand (Kshs 16.986 million) and the GDP per Capital of the main destination countries is US$ 82.016 thousand (Kshs 8.473 million). The figures are converted to Kenya Shillings (Kshs) using the average exchange rate of the US Dollar to Kenya Shilling for the January 2017–December 2019 period, where US$ 1 exchanged for Kshs 103.31.

The average refunds paid by KRA to the firms during the three-year period was US$ 324.7 thousand (Kshs 33.5 million), with a minimum value of US$ 10.65 thousand (Kshs 1.0 million) and a maximum value of US$ 4,103.3 thousand (Kshs 423.9 million). Additionally, the descriptive statistics show that on average, it took 5.5 months to verify the refund claims during the period compared with prescribed timeframe of 24 hours in Peru and three moths in France as found out in the study by Harrison & Krelove (2005). The shortest time taken to verify VAT refund claims was one month while the longest it took was 14.4 months. The descriptive statistics also show that it took a maximum of one month to pay VAT refund claims after they were verified. This means that the payment for VAT refunds is well provided for thus the challenge is with the time taken to verify the refund claims. Since the refund payment period has values of one for all cross-sectional units, it is dropped from the model to control for collinearity problem.

4.3 Relationship between payment of VAT refunds and exports of firms

The first objective was to estimate the effects of the payment of VAT refunds on exports of firms in Kenya was achieved. For empirical analysis of the effect of VAT refunds on volumes of exports by the Kenyan firms, the study employed pooled OLS regression method using firm-level panel data. This was done following Hausman test results and absence of significant panel effect in the data.

4.3.1 Diagnostic Tests Results

To test for panel unit roots, the study therefore employed the ADF Fisher unit root test. Panel level heteroskedasticity was tested using the modified Wald test. The test for contemporaneous correlation was conducted by Pesaran's (2004) test of cross sectional independence. Table 4.2 shows the results for the ADF Fisher unit root test, heteroskedasticity and contemporaneous correlation tests conducted on the firm level data.

Table 4.2: Diagnostic Tests Results

Test	Results	Conclusion
ADF Fisher unit root test		
a. Exports	Chi2=14.91 P=0.015	Stationary
b. VAT refunds	Chi2=11.29 P=0.027	Stationary
Heteroskedasticity Test		
Modified Wald Test	chi2 (13) = 8.34 **Pob**>chi2 = 0.9821	No Heteroskedasticity
Test for Contemporaneous Correlation		
Pesaran's CD Test	Error: The panel is highly unbalanced. Not enough common observations across panel to perform Pesaran's test.	No cross-sectional dependence
Note: (*), (**) and (***) indicates statistical significance at 10%, 5% and 1%		

Source: Author (2023)

The ADF test results show that exports and VAT refunds are stationary since their p-values are less than 0.05 and therefore we reject the null hypothesis that the series have a unit root. The diagnostic tests show that there is no panel level heteroscedasticity and that there is no cross-sectional dependence in the model. This is expected in the view of the short time period and the fact that this is a micro data of export firms with limited or no common characteristics.

4.3.2 Selection of the Regression Model

To determine the appropriate regression model to employ, the study relied on Hausman test and Lagrange Multiplier test. For Hausman test, the null hypothesis is that random effects model is preferred to fixed effects model. On the other hand, the null hypothesis for the random effects test is that there is no difference across the cross-sectional units (Greene, 2012).

Table 4.3: Hausman and Random Effects

Test	Test Statistics	Conclusion
Hausman Test	Chi2(3) = 6.12 Prob>chi2 = 0.2950	Random Effects model is preferred to Fixed Effects model
Random Effects Test	Chibar2(01) = 1.15 Prob>Chibar2 = 0.1415	No significant panel (random) effect
Note: (*), (**) and (***) indicate statistical significance at 10%, 5% and 1% respectively		

Source: Author (2023)

Since Prob>chi2 = 0.2950> 0.05, we accept the null hypothesis and conclude that random effect is more efficient and consistent than the fixed effect as observed from the hausman test results and conclude that the random effects model is preferred to the fixed effects regression model. On the other hand, since Prob>Chibar2 = 0.1415, the results for random effects test show that at five percent level of significance, there is no significant panel effect in the dataset. This means that the random effects model is not appropriate in analyzing the dataset. The study used Pooled OLS regression method to estimate the effect VAT refunds on volume of exports.

4.3.3 Discussion of the Empirical Results

The first objective was to estimate the effects of the payment of VAT refunds on exports of firms in Kenya. Based on the diagnostic test results conducted on the firm level panel data, the study opted for pooled OLS regression method. The empirical regression results without controlling for sector specific effects are presented in Table 4.4 while empirical regression results when the sector specific effects are controlled are presented in Table 4.5.

Table 4.4: Pooled OLS regression results without controlling for sector specific effects

	Without Controlling for Sector Specific Effects (1)	
Regressors	Dependent Variable: Log of Exports (*Ln Export*)	p-values
Log of Refund Paid (*LnRefund*)	0.1898*** (0.1122)	0.0043
Refund Verification Period (*RefundP*)	-0.0633** (0.0323)	0.022
Log of Firm Turnover (*LnFTO*)	1.1301*** (0.2655)	0.0039
Log GDP per Capita (*LnGDPC*)	0.3525*** (0.1047)	0.0017
Log of Real Effective Exchange Rate (*LnREER*)	-0.0962 (3.0963)	0.9514
Number of Observations	129	
Constant Term	-7.5170 (11.8942)	
Adjusted R-squared	0.6807	
F – statistic	Prob > F = 0.0011	
Note: Level of significance are denoted by *** p<1%, ** p<5%, and* p<10%. The figures inside the parentheses are robust standard errors		

Source: Author (2023)

Since Prob>F = 0.0011, the model variables are significant in explaining the sample variations in export performance. The adjusted R-squared result shows that the model variables explain about 68.1 percent of the variations in Kenya's export performance.

The VAT refunds payments is used as the main explanatory variable in this study. From the estimation results, firms' exports are positively affected by payment of VAT refunds. The coefficient is significant at one percent level of significance as indicated by the p-value of 0.0043. For each percentage point of increase in the payment of VAT refunds, the value of firms' exports increases by 0.19 percent which translates into an additional $6.86 of exports for each $1 of payment of VAT refunds. Based on the descriptive statistics presented in Table 4.1, the average VAT refunds paid were estimated at USD 324,688, translating into an additional USD 2,227,359 of exports. This magnitude is very large as it amounts to 0.046 percent of Kenya's total exports made in 2017. Analysis of VAT rebates and firms 'export performance in China using firm (level) data similarly showed that a large- and significant-impact on the volume of Chinese exports (Chandra & Long, 2013). The findings further reveal that for each percentage point increase in the VAT rebates rate, the amounts of exports increases on average by 0.13 percent, which translates into an additional $4.70 of exports for each $1 of exports tax rebates. This suggests that in both emerging and developed countries, including Kenya, a country's reliance on VAT revenue is significantly and negatively associated with the economy's trade intensity in addition to its percentage of exports. Also, an increased dependence of a country on VAT revenue tends to be related with a sharp decrease in its net exports, even though the effect dwindles fast. The inconsistency between the neutral effects of VAT on exports hypothesized by trade policy may be due to perfect payment of VAT refunds on inputs used by the exporters. Also, the findings show that it is only in an idealized system that VAT will not affect the country's exports. However, with non-ideal aspects such as VAT refunds, the VAT system will have an effect on country's exports.

The VAT refund verification period was found to have a negative but significant relationship with firms' exports. This is evident of the negative coefficient of 0.063 and p-value of 0.022 which is significant at 5 percent level of significance. A delay in the VAT refund verification period by one month reduces firms' exports values by 0.0633 percent assuming all other factors remains constant. The delay is mostly occasioned by lodgment of mostly fraudulent claims which requires strict verification before they are approved. This finding is consistent with the theoretical prediction that the value added tax system with delayed VAT refunds process for exports reduces trade volume (Feldstein & Krugman, 1990). This further implies that in the absence of traders lodging fraudulent VAT claims and efficiency by KRA staff in verification of VAT claims, timely payment of verified VAT refunds will enhance firms' exports.

The coefficients of the control variables that were found to be significant in explaining export performance were exporting firm's turnover and the main destination country's GDP per capita. This is evident of the respective p-values of 0.0039 and 0.0017 both at one percent level of significance. The empirical results show that at one percent level of significance, a percentage point increase in the export firms' turnover result to a 1.13 percent point rise in export performance without controlling for the sector specific effects. The results also show that one percentage point increase in GDP per capita of the destination country would lead to a 0.35 percent increase in export performance. This implies that an increase in income (hence purchasing power) of the citizens of the destination country would lead to an increase in demand for the Kenyan exports thus an increase in export performance.

The second model shows regression results controlling for sector specific effects presented in Table 4.5. Since Prob > F= 0.0000, the model variables are jointly significant in explaining the sample variations in export performance. The adjusted R-squared shows that the model variables explain about 71.6 percent of the variations in Kenya's export performance.

Table 4.5: Pooled OLS regression results controlling for sector specific effects

Regressors	***Controlling for Sector Specific Effects(2)*** Dependent Variable: Log of Exports (*Ln Export*)	P-value
Log of Refund Paid	0.1997*** (0.1033)	0.0073
Refund Verification Period	-0.0532* (0.0436)	0.065
Log of Firm Turnover	1.2811*** (0.2770)	0.0059
Log GDP per Capita	0.3872*** (0.0945)	0.0063
Log of Real Effective Exchange Rate	-0.5156 (3.2237)	0.7674
Dummy for Horticultural sector	-0.7872* (0.4200)	0.042
Dummy for Manufacturing sector	-0.7711 (0.5724)	0.8943
Dummy for Mining Sector	-0.4230 (0.5443)	0.1246
Number of Observations	129	
Constant Term	-8.1427 (11.5507)	0.2345
Adjusted R-squared	0.7155	
F – statistic	Prob > F = 0.000	
Levels of significance are as follows: *** p<1%, ** p<5%, and* p<10%.		

Source: Author (2023)

The firms' exports are positively affected by payment of VAT refunds. The coefficient is significant at one percent level of significance as suggested by the p-value of 0.0073. For each percentage point of increase in the payment of VAT refunds, the value of firms' exports increases by 0.1997 percent which translates into an additional $ 7.22 of exports for each $1 of payment of VAT refunds compared with the additional $6.862 of exports when there is no control of sector specific effects. Analysis of VAT rebates and export performance in China using firm level data similarly showed that a large and significant impact on the volume of Chinese exports. The findings further reveal that for each percentage point of increase in the VAT rebates rate, the amounts of exports increases on average by 13 percent, which translates into an additional $4.70 of exports for each $1 of exports tax rebates (Chandra &Long, 2013). The VAT refund verification period was found to have a negative but significant relationship with firms' exports. This is evident of the negative coefficient of 0.0532 and p-value of 0.065 which is significant at 10 percent level of significance. A delay in the VAT refund verification period by one month reduces firms' exports values by 0.0532 percent assuming all other factors remains constant. The delay is mostly occasioned by lodgment of mostly fraudulent claims which requires strict verification before they are approved. This finding is consistent with the

theoretical prediction that VAT system delayed VAT refunds process for exports reduces trade volume (Feldstein & Krugman, 1990). This further implies that in the absence of traders lodging fraudulent VAT claims and efficiency by KRA staff in verification of VAT claims, timely payment of verified VAT refunds will enhance firms' exports.

The coefficient of the control variables that were found to be significant in explaining export performance were export firm's turnover and the main destination's GDP per capita. The p-value of the coefficients of exports firms' turnover and the main destination's GDP per capita were estimated at 0.0059 and 0.0063 both at one percentage point level of significance. The empirical results show a percentage point rise in the export firms' turnover would lead to a 1.28 percent increase in export performance holding all other factors constant. Also, a percentage point rise in GDP per capita of the destination country would results to a 0.39 percent rise in export performance.

The second model controlled for the sector specific effects using dummies for the respective sectors. The Agriculture sector (crops and animal products) was omitted due to the high correlation with the Horticultural sector. The empirical results show that at ten percentage point level of significance, a percentage point policy control in the horticultural sector would lead to a 0.7872 percent decrease in export performance holding all other factors constant. The results show the importance of Horticultural sector in export performance as indicated by Were *et. al* (2002) which identified the main exports from Kenya as tea, coffee and horticultural products. Though the coefficients are insignificant except that for Horticultural sector dummy, the results show that all their coefficients are negative implying that there are sector or firm specific factors that influence the export performances. This requires further investigation on the specific factors. Since the coefficients of the two dummies are not significant, therefore the first model in which there is no control over sector specific effects is preferred.

4.4 Time taken to verify and pay VAT refunds on exports of firms in Kenya

The second objective was to establish the effects of the time taken to verify and pay VAT refunds on exports of firms in Kenya. This objective was achieved by pooled OLS regression method following hausman test results and absence of significant panel effect in the dataset. Additionally, descriptive statistics for export values, refund verification period and refund payment period as summarized in Table 4.6.

Table 4.6: Time taken to verify and pay VAT refunds on exports of firms in Kenya

Variable	Mean	Std. Dev	Min	Max
Export Values (US $)	133,098.3	13,629.7	43,061.8	164,421.3
Refund Paid (US $)	324,688.0	716,097.5	10,650.0	4,103,288.0
Refund Verification Period (Months)	5.5	5.6	1	14
Refund Payment Period (Months)	1	0	1	1

Source: Author (2023)

The average refunds paid by KRA to the firms during the three-year period was US$ 324.7 thousand (Kshs 33.5 million), with a minimum value of US$ 10.65 thousand (Kshs 1.0 million) and a maximum value of US$ 4,103.3 thousand (Kshs 423.9 million). Additionally, the descriptive statistics show that on average, it took 5.5 months to verify the refund claims during the period, this is a longer time prescribed by the IMF survey on developing countries are bound by law to make refunds within 30 days (Harrison & Krelove, 2005). The shortest time taken to verify VAT refund claims was one month while the longest it took was 14.4 months. The descriptive statistics also show that it took a maximum of one month to pay VAT refund claims after they were verified. This means that the payment for VAT refunds is well provided for thus the challenge is with the time taken to verify the refund claims. Since the refund payment period has values of one for all cross-sectional units, it is dropped from the model to control for collinearity problem.

From the empirical regression results presented in Table 4.7, the refund period has a negative relationship with export performance. This implies that delay in payment of the VAT refunds negatively affects export performance of the Kenyan firms. The empirical results in the first

model, without considering the sector specific effects, a delay in verification of refund claims by one month would lead to about 0.06 percent decline in Kenya's export performance.

Table 4.7: Regression results for time taken to pay verified VAT refunds

	Without Controlling for Sector Specific Effects (1)	
Regressors	Dependent Variable: Log of Exports (*Ln Export*)	p-values
Log of Refund Paid (*LnRefund*)	0.1898*** (0.1122)	0.0043
Refund Verification Period (*RefundP*)	-0.0633* (0.0323)	0.022
Number of Observations	129	
Constant Term	-7.5170 (11.8942)	
Adjusted R-squared	0.6807	
F – statistic	Prob > F = 0.0011	
Note: Level of significance are denoted by *** p<1%, ** p<5%, and* p<10%. The figures inside the parentheses are robust standard errors		

Source: Author (2023)

The negative coefficient indicates that the export firms always look for alternative sources of funds to cater for their working capital when the refunds are still being processed by KRA. These alternative funding options come at additional costs which affects the firms' export performance.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Summary and Conclusions

In Kenya, VAT collections are sent to The National Treasury, which then allocates funds for settling VAT refunds for a specified fiscal year. Long VAT refund processes and delays in refund payments arguably deprive export firms their working capital, which affects their operations, output and profits. This may motivate manufacturers to alter their blend of production and/or lower their export production. This study investigated how VAT refund affects the export performance of firms in Kenya. The specific focus of the study was to: estimate the effects of the payment of VAT refunds on export volumes of firms in Kenya; and establish the effects of time taken to verify and pay VAT refunds on export volumes of firms in Kenya.

The study employed unbalanced panel data consisting of 43 export firms observed at three different periods (2017, 2018 and 2019). The study was faced by missing data challenges thus the final dataset employed in the analysis was arrived at by eliminating the cross-sectional units with incomplete data on the key variables. Firms included in the analysis are those that had data on dates of VAT refunds lodgments, approval and payments, VAT refund amounts; and at least three years' observations on exports performance. After performing the diagnostic tests, the study employed Pooled OLS model in the analysis. Contrary to the first empirical model, the second empirical model included the sector dummies to control for the sector specific characteristics.

The descriptive analysis shows that the average refunds paid by KRA to the firms during the three-year period was Kshs 33,542,610.80, with a minimum value of Kshs 1,000,221.77 and a maximum value of Kshs 423,899,228.03. Additionally, the descriptive statistics show that on average, it took 5.5 months to verify the refund claims during the period. The shortest time

taken to verify VAT refund claims was one month while the longest it took was 14 months. However, it took only one month to pay VAT refund claims after they were verified. This means that the payment for VAT refunds is well provided for thus the challenge is with the time taken to verify the refund claims.

The empirical models showed that payment of VAT refunds has a positive relationship with export performance, meaning that efficient payment of VAT refund is likely to lead to an increase in export performance in Kenya. Moreover, the results from both models also showed that refund verification period has a negative relationship with export performance. This implies that delay in verification of VAT refunds negatively affects export performance of the Kenyan firms. The empirical results in the first model, without considering the sector specific effects, show that a delay in payment of refunds by one month would lead to about 0.06 percent decline in Kenya's export performance. On the other hand, considering the sector specific effects, the study showed that a delay in payment of refunds by one month would also lead to about 0.06 percent decline in Kenya's export performance.

Export firm's turnover and the main destination's GDP per capita were found to positively influence Kenya's export performance. The empirical results showed that a percentage increase in the export firms' turnover would result to a 1.13 percent point rise in export performance in the first model (without controlling for the sector specific effects) and a 1.28 percent increase in export performance in the second model (controlling for the sector specific effects). From the study findings, a percentage increase in GDP per capita of the destination would lead to a 0.35 percent increase in export performance in the first model and a 0.39 percent increase in export performance in the second model. This implies that an increase in per capita income (purchasing power of the citizens) of the destination country would lead to an increase in demand for the Kenyan exports thus an increase in export performance.

5.2 Policy Recommendations

The study results show that payment of VAT refunds has a positive relationship with the improved export performance whereas longer refund claims verification periods lead to a decline in export performance of the export firms in Kenya. In view of these findings, the following recommendations are made to improve the VAT refunds process:

First**, KRA should review the 100 percent VAT refunds verification requirement**: focus on reducing the verification period to below the average of 5.5 months recorded in the four years under study. This can be achieved by risk profiling of the VAT taxpayers seeking refunds to ensure faster payment of refunds to compliant and less risky taxpayers and release of the available staff resources to verify the riskier taxpayers.

Secondly**, there is need for a comprehensive clean-up of the VAT data by KRA** (including the VAT refunds data) to improve on the data quality (completeness and accuracy) to be used in analyses to inform management decision making and also risk profiling of the VAT taxpayers.

Thirdly, the National Treasury should allocate the Kenya Revenue Authority sufficient money to ensure verified VAT claims are paid within 30 days. This will ensure exporting firms have enough cash flows for their export trade.

Lastly, the Kenya Revenue Authority should invest in technology that supports automation of sales and purchases of invoices to reduce time taken to verify VAT refunds. This involves enhancement of systems such as electronic tax invoice management systems and subsequent integration with itax so that there is 360-degree view of VAT taxpayers.

5.3 Areas for Further Study

A further study involving a larger sample and a survey of the sampled firms to fill in the data gaps experienced in the current study is recommended.

References

Anyanzwa, J. (2014). "Kenya Revenue Authority unable to pay Kshs 30 billion in outstanding VAT refunds", Business news, Standard, Nairobi.

Braakmann, N., Gao, B., & Maioli, S. (2017). VAT Rebates As Trade Policy: Evidence from China. Newcastle University Business School, UK. Available at: *http://www.revecap.com/encuentros/trabajos/b/pdf/027.pdf* (accessed on 25th September 2018).

Chandra, P., & Long, C. (2013). VAT rebates and export performance in China: firm-level evidence. *Journal of Public Economics, 102*, pp. 13-22.

Chirchir, F.K., Muse, M.A. & Jagongo, A. (2017). Exchange Rate Volatility and Export Performance of Tea Firms in Kenya. *International Journal of Science and Research (IJSR)*, Vol. 6 Issue 2. DOI: 10.21275/ART20171296.

Epaphra, M. (2016). Determinants of Export Performance in Tanzania. *Journal of Economics Library*, Vol. 3, Issue No. 3. DOI: 10.1453/jel. v3i3.1015

Gourdon, J., Monjon, S. & Poncet, S. (2014). Incomplete VAT Rebates to Exporters: How Do they Affect China's Export performance? CEPII Working Paper No.2014-05.

Greene, William H. (2012), Econometric Analysis, 7th edition, Prentice Hall.

Harrison, G. & Krelove, R. (2005), VAT Refunds: A Review of Country Experience. IMF Working Paper WP/05/218. Washington: International Monetary Fund, Fiscal Affairs Department.

ICPAK (2015). "Kenya's Finance Act 2015: An Update on Kenya's Taxation Regime", Indirect Tax Alert (2014). Nairobi: Ernst & Young.

Irungu, G. (2013, September 15). Traders resort to debt as VAT refunds delay. Business Daily. Retrieved from https://www.businessdailyafrica.com/news/Traders-resort-to-debt-as-VAT-refunds-delay/539546-1993922-4tscj7z/index.html.

Kenya Revenue Authority. (2011). Tax Model Concept Paper. Nairobi: Kenya Revenue Authority.

Liang, X. (2014). Effect of Export Tax Rebate on Export Volume Evidence from China. Masters' Thesis, Ritsumeikan Asia Pacific University. Available at: (accessed on 26th September 2018).

Maugu, L. K., Mwirigi, R., Maara, J.N., & Galo, N. (2013). The Determinants of Supply of Kenya's Major Agricultural Crop Exports from 1963 to 2012. *International Journal of Business, Humanities and Technology*, Vol. 3 No. 5. Available at: (accessed on 25th Septmeber 2018).

Pesaran, M. H. & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. Chapter 11 in S. Strom (ed.), Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge: Cambridge University Press.

Pesaran, M.H., Shin, Y. & Smith R. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. Journal of Applied Econometrics, 16: pp. 289-326.

Republic of Kenya (2018). Economic Survey 2018. Nairobi: Kenya National Bureau of Statistics.

Republic of Kenya. (2017). Laws of Kenya: Value added tax act of 2013 (Revised 2017). Nairobi: Government printer

Republic of Kenya. (2016). Tax Procedures Act No. 29 of 2015. Nairobi: National Council for Law Reporting.

Republic of Kenya. (2014a). Value Added Tax Act No. 35 of 2013. Nairobi: National Council for Law Reporting.

Republic of Kenya (2014b). Economic Survey 2014. Nairobi: Kenya National Bureau of Statistics.

Ricardo, D. (1817). On the Principles of Political Economy and Taxation. Ontario, Canada: Batoche Books. Available at: https://socialsciences.mcmaster.ca/econ/ugcm/3ll3/ricardo/Principles.pdf

Sharma, R. (2017). Domestic Taxes and Export Composition: Evidence from VAT Adoption Worldwide. Economics Faculty Working Papers, No. 55. Colgate University Libraries. Available at: (accessed on 1st October, 2018).

Wang, L., & Anwar, S. (2019, January). Does VAT Rebate Policy Prompt the Export Performance of Mechanical Products? In Allied Social Science Associations (ASSA) and American Economic Association (AEA) 2019 Annual Meeting: Trade and Economic Regimes session, Atlanta (pp. 4-6).

Were, M., Ndung'u, S.N., Geda, A., & Karingi, S.N. (2002). Analysis of Kenya's Export Performance: An Empirical Evaluation. KIPPRA Discussion Paper No. 22. Nairobi: Kenya Institute for Public Policy Research and Analysis.

ANNEX: DATA

Year	Panel ID	Fake ID	Destination GDP per Capita (Current US$)	REER for Destination Country	Quantity	Export Value (USD)	Refund Paid (US	Refund Va	Firm Turnover	Sector Dummy
2017	1	1284	48,555	97.4899	9,275,220	1661019.184	49,484	75	2,736,961	0.0000
2018	1	1284	53,019	99.3990	9,720,566	1523047.4	86,130	50	2,786,931	0.0000
2019	1	1284	52,295	99.3091	4,251,649	1277657.582	53,776	444	2,836,902	0.0000
2020	1	1284	52,304	101.2531	1,794,070	895981.4654	50,531	235	2,648,962	0.0000
2017	2	1290	7,893	92.120	141,343	1,172,978	128,770	62	14,232,633	1.0000
2018	2	1290	8,280	93.028	171,126	1,574,868	182,161	221	14,369,833	1.0000
2019	2	1290	7,971	91.884	201,657	2,163,761	265,069	469	12,785,015	1.0000
2020	2	1290	6,711	88.019	172,475	1,897,514	240,168	283	13,021,805	1.0000
2017	3	1244	40,305	97.0773	24,944,329	58406257.35	2,909,868	126	71,563,872	1.0000
2018	3	1244	42,993	98.8467	25,762,783	59255538.24	2,100,960	126	96,341,628	1.0000
2019	3	1244	42,354	98.4242	19,590,875	49069162.67	4,938,541	390	75,854,179	1.0000
2020	3	1244	40,285	98.6185	14,107,911	43972171.76	3,405,302	279	67,273,565	1.0000
2017	4	1309	1,465	121.4579354	23,637,523	82,461,026	101,248	82.5	59,867,878	1.0000
2018	4	1309	1,482	107.0840656	22,822,096	69,042,250	82,560	41	66,042,981	1.0000
2019	4	1309	1,285	97.23061765	23,404,048	59,943,041	56,470	326.5	65,566,098	1.0000
2020	4	1309	1,194	97.63116098	26,376,573	60,021,355	105,623	127	66,519,865	1.0000
2017	5	1281	1,969	100.7989278	2,530,588	6589357.685	2,180,101	257	32,756,149	1.0000
2018	5	1281	772	141.35	1,716,522	4791116.56	796,464	182	34,351,898	1.0000
2019	5	1281	856	155.71	950,761	3046003.303	3,164,872	513	35,043,850	1.0000
2020	5	1281	936	153.00	967,672	2343884.58	1,056,753	108	25,942,542	1.0000
2017	6	1199	44,443	94.79030191	53,158,978	66,110,270	7,379,134	348	81,453,893	1.0000
2018	6	1199	53,019	99.3990	45,486,805	60,937,472	1,375,774	46	103,529,156	1.0000
2019	6	1199	52,295	99.3091	65,001,078	85,633,449	7,082,783	295	101,817,366	1.0000
2020	6	1199	45,724	96.70579882	79,653,428	103,024,656	7,593,690	106	105,240,947	1.0000
2017	7	1348	769	147.66	1,708,787	6875514.67	678,300	138	26,268,353	1.0000
2018	7	1348	772	141.35	204,084	1031385.077	136,101	65	7,565,794	1.0000
2019	7	1348	581	125.5673	712,441	3269749.284	862,395	783	11,751,674	1.0000
2020	7	1348	557	127.5610	1,301,083	5559879.207	91,881	284	15,195,274	1.0000
2017	8	1125	1,981	118.30	339,682,784	66,674,944.33	4,945,539	108	58,877,790	1.0000
2018	8	1125	1,997	107.08	302,610,344	66,176,046.57	2,439,815	148	64,765,569	1.0000
2019	8	1125	7,817	118.9	254,905,790	58,142,661.77	2,418,041	189	61,821,680	1.0000
2020	8	1125	1,901	105.00	242,450,094	48,556,972.48	3,578,204	796	65,187,840	1.0000
2017	9	1225	497.31	71.33	108,118	620995.1747	88,061	94	14,530,120	1.0000
2018	9	1225	535.35	76.76	186,175	1187407.653	99,581	65	21,284,687	1.0000
2019	9	1225	583.11	86.31	250,995	1649062.29	127,839	127	26,736,988	1.0000
2020	9	1225	625.29	92.88	234,229	2122688.641	313,590	103	29,125,340	1.0000
2017	10	1087	467	104.0725688	3,983,289	8,902,542	1,292,091	168	13,633,289	1.0000
2018	10	1087	557	118.2125793	307,248	830,249	719,495	62	3,610,952	1.0000
2019	10	1087	581	125.5673389	114,296	304,594	111,509	85	2,730,194	1.0000
2020	10	1087	557	127.5609652	5,429,624	11,677,384	195,626	99	833,116	1.0000
2017	11	1164	32,327	95.27	10,382,022	29253144.55	836,297	115.0	30,412,265	1.0000
2018	11	1164	34,609	96.80	10,905,993	29423095.98	2,483,351	147.1	31,086,407	1.0000
2019	11	1164	33,567	94.50	8,776,075	22260752.51	1,577,387	196.0	23,138,697	1.0000
2020	11	1164	31,676	95.00	5,180,627	16257754.34	612,680	167.8	15,865,129	1.0000
2017	12	1078	48,555	97.4899	547,397	2,589,011	111,386	59	1,738,564	1.0000
2018	12	1078	53,019	99.3990	601,759	2,681,928	22,046	30	2,714,706	1.0000
2019	12	1078	52,295	99.3091	671,010	2,486,205	46,831	529	2,446,251	1.0000
2020	12	1078	52,304	101.2531	872,854	2,412,370	38,255	365	1,807,170	1.0000
2017	13	1381	1,981	118.30	2,935,496	4,822,277	499,698	237	4,794,447	1.0000
2018	13	1381	1,997	107.08	2,954,106	4,322,199	53,152	36	4,253,081	1.0000
2019	13	1381	1285	97.23061765	1,519,384	1,870,453	118,455	440	1,870,668	1.0000
2020	13	1381	1901	97.63	218,430	334,674	55,566	239	3,332,557	1.0000
2017	14	1362	1981	118.30	1,343,843	1,294,596	55,240	14	1,392,550	1.0000
2018	14	1362	9,977	121.74	1,432,744	1,530,341	54,263	77	1,473,144	1.0000
2019	14	1362	10,217	120.89	1,610,000	1,456,301	100,046	16	1,460,511	1.0000
2020	14	1362	10,500	123.44	1,189,900	942,993	60,421	161	904,674	1.0000
2017	15	1285	8,879	120.0927778	2,736,575	4,440,936	129,772	102	4,193,080	1.0000
2018	15	1285	9,977	121.7301327	2,382,950	2,724,691	73,920	25	2,898,711	1.0000
2019	15	1285	2,101	97.23	1,417,190	1,102,373	25,245	36	1,243,863	1.0000
2020	15	1285	1,194	97.63116098	667,740	682,495	45,719	121	835,244	1.0000
2017	16	1348	1,981	118.30	1,805,042	2,432,394	190,906	121	2,237,638	1.0000
2018	16	1348	1,997	107.08	2,189,834	3,049,585	289,583	62	3,368,988	1.0000
2019	16	1348	2,101	97.23	2,192,300	2,515,952	245,392	53	3,141,627	1.0000
2020	16	1348	1,901	105.00	2,602,460	2,484,227	261,833	134	2,527,135	1.0000
2017	17	1484	467	104.0725688	21,074,061	23,368,781	4,468,093	317	173,267,445	1.0000
2018	17	1484	557	118.2125793	21,909,808	25,350,494	527,333	322	206,413,584	1.0000
2019	17	1484	581	125.5673389	21,756,434	24,605,980	3,827,538	313	243,231,613	1.0000
2020	17	1484	557	127.5609652	18,659,166	21,330,747	3,543,148	105	249,769,452	1.0000
2017	18	1172	467	104.0725688	16,831,897	19,386,681	9,201,783	350	188,058,635	1.0000
2018	18	1172	557	118.2125793	13,959,931	16,286,356	232,893	312	224,438,389	1.0000
2019	18	1172	581	125.5673389	12,224,879	13,837,539	794,838	514	246,356,631	1.0000
2020	18	1172	557	127.5609652	13,914,658	15,573,346	3,620,569	141	264,282,272	1.0000
2017	19	1302	467	104.0725688	7,850,393	17,852,504.35	1,806,827	129	69,803,251	1.0000
2018	19	1302	557	118.2125793	6,708,782	12,279,154.96	1,145,155	136	61,305,092	1.0000
2019	19	1302	581	118.2125793	6,795,972	12,158,909.06	717,401	343	55,436,705	1.0000
2020	19	1302	557	118.2125793	6,312,841	10,289,612.00	857,020	91	46,246,548	1.0000
2017	20	1044	293.00	129.7	5,293,508	3,564,924	445,148	230.875	39,202,754	1.0000
2018	20	1044	271.75	118.3	4,503,370	2,749,593	115,561	250	33,104,636	1.0000
2019	20	1044	581	127.5609652	5,079,643	3,797,532	312,044	1207.5	30,277,841	1.0000
2020	20	1044	557	127.5609652	2,672,101	2,242,392	309,370	397	28,107,055	1.0000
2017	21	1342	467.07	104.0725688	1,155,388	2,435,521	898,575	396	8,170,581	1.0000
2018	21	1342	557.06	118.2125793	1,095,584	2,385,096	411,171	32	8,106,956	1.0000
2019	21	1342	581	125.5673	1,598,366	3,574,330	193,752	233	8,875,636	1.0000
2020	21	1342	557	54.0	1,514,551	3,264,628	552,320	99	10,716,732	1.0000
2017	22	1134	768.52	147.66	97,863,292	8,513,549	645,469	133	10,390,307	1.0000
2018	22	1134	771.52	141.35	53,734,878	5,075,694	122,123	186	32,746,030	1.0000
2019	22	1134	855.76	155.71	7,701,745	838,585	1,035,381	530	11,172,374	1.0000
2020	22	1134	557	127.5609652	127,382	191,291	116,402	243	21,959,202	1.0000
2017	23	1212	293.00	129.7	45,459	163,754	227,084	295	12,687,912	1.0000
2018	23	1212	1,516	88.44292282	68,077	201,769	86,309	384	12,422,129	1.0000
2019	23	1212	1,305	79.58875089	35,580	86,463	741,920	674	14,928,900	1.0000
2020	23	1212	309.42	107.78	32,163	112,360	291,637	382	15,486,593	1.0000
2017	24	1439	44,089	99.10	7,659,271	32,981,239	450,946	194	45,157,341	1.0000
2018	24	1439	47,555	101.50	6,560,051	34,729,696	1,573,399	290	39,063,182	1.0000
2019	24	1439	46,414	100.10	5,074,140	23,080,662	4,930,771	353	32,969,022	1.0000
2020	24	1439	44,594	101.50	4,743,903	24,901,657	481,258	185	24,861,834	1.0000
2017	25	1063	746.83	93.60	134	2,860,953	5,652	221	149,615,546	1.0000
2018	25	1063	770.26	90.00	557	2,561,810	1,052	25	172,119,764	1.0000
2019	25	1063	794.45	93.30	135	3,849,172	91,173	354	199,592,633	1.0000
2020	25	1063	817.04	95.00	78	1,512,099	25,529	179	167,151,114	1.0000
2017	26	1220	467.07	104.0725688	373,801	1,305,079	315,550	86	19,737,046	1.0000
2018	26	1220	1,516	88.44292282	488,063	1,762,372	373,460	204	21,292,703	1.0000
2019	26	1220	2,230	123.0662985	509,650	1,939,548	803,686	473	22,236,251	1.0000
2020	26	1220	2,097	117.4536653	683,866	3,274,126	474,558	98	22,074,575	1.0000
2017	27	1451	467.07	104.0725688	2,039,507	10,447,983	540,083	336	6,201,181	1.0000
2018	27	1451	61,599	97.1662774	1,423,983	9,322,038	1,076,642	329	28,072,471	1.0000
2019	27	1451	60,213	95.47503049	1,245,789	7,802,736	199,737	358	21,305,964	1.0000
2020	27	1451	625.29	92.88	1,674,947	13,230,768	386,020	800	15,502,952	1.0000
2017	28	1036	595	16.7	2,033	7,315	713	59	48,054,398	1.0000
2018	28	1036	1,352	88.44	483,633	358,269	561,582	72	48,054,398	1.0000
2019	28	1036	1,156	79.59	955,104	731,304	1,805,704	135	45,194,007	1.0000
2020	28	1036	1,128	66.28	1,135,434	1,027,426	997,259	40	50,914,789	1.0000
2017	29	1486	1,005	105.18	1,987	27,716	522,846	156	24,683,867	1.0000
2018	29	1486	314.5	104.00	2,361	10,167	524,151	112	26,841,826	1.0000
2019	29	1486	2,101	97.23	17,098	105,677	105,868	945	26,222,470	1.0000
2020	29	1486	583	101.50	178	2,686	237,614	72	24,218,654	1.0000
2017	30	1372	293	129.7	22,921	318022.9397	94,480	252	13,798,925	1.0000
2018	30	1372	272	118.3	11,952	164572.5546	183,229	495	16,698,175	1.0000
2019	30	1372	320	108.88	52,126	266779.4165	413,281	583	18,765,798	1.0000
2020	30	1372	6,711	88.019	11,901	84141.01058	218,376	170	20,730,427	1.0000
2017	31	1345	15,128	118.53	19,267,805	2,268,040	377	13	157,193,972	1.0000
2018	31	1345	43,839	128.9969228	28,911,920	3,872,917	85	9	136,966,888	1.0000
2019	31	1345	15,343.04	119.13	25,986,290	3,610,811	3,868,045	317	145,197,224	1.0000
2020	31	1345	42,529.15	130.1969	18,421,720	2,489,831	879,579	195	141,395,944	1.0000
2017	32	1184	2,914	177.22	2	10	251,360	40	10,654,271	1.0000
2018	32	1184	770.26	90.00	390	1,224	280,575	206	10,987,431	1.0000
2019	32	1184	794.45	93.30	60,430	188,682	253,871	552	11,342,746	1.0000
2020	32	1184	817.04	95.00	22,290	62,239	42,581	127	12,290,831	1.0000
2017	33	1010	44,443	94.79030191	444	356	20	36	22,306,783	1.0000
2018	33	1010	63,064	112.9863231	68,439	85,429	618,985	97	41,936,753	1.0000
2019	33	1010	33,566.79	94.50	1,165	24,199	2,019,129	213	51,156,890	1.0000
2020	33	1010	595	54.0	26,400	12,398	1,066,530	283	89,227,134	1.0000
2017	34	1415	772.32	99.66	3,146,788	2,623,815	393	6	33,302,071	1.0000
2018	34	1415	557.06	118.2125793	2,649,973	1,727,761	456,159	176	37,419,313	1.0000
2019	34	1415	580.72	125.5673389	3,182,800	2,280,779	524,563	252	41,456,715	1.0000
2020	34	1415	556.81	127.5609652	3,142,014	2,810,204	1,042,817	147	38,492,831	1.0000
2017	35	1140	2,021	73.11	198,259	1,240,427	17	154	33,952,285	1.0000
2018	35	1140	2,194	67.00	306,291	1,957,007	448	6.5	38,591,465	1.0000
2019	35	1140	2,210	64.24	130,517	852,366	2,941,864	879	41,128,389	1.0000
2020	35	1140	2,329	65.14	151,510	918,556	739,028	282	37,585,002	1.0000
2017	36	1214	1,335.67	94.51	213,652	731,348	0	19	6,448,716	1.0000
2018	36	1214	1,352.16	88.44	86,005	302,756	7,655	13	8,516,126	1.0000
2019	36	1214	1,156.15	79.59	20,852	1,210,419	17,519	530	10,076,118	1.0000
2020	36	1214	1,128.21	66.28	71,096	177,223	6,359	164	6,956,135	1.0000
2017	37	1275	1,103	16.7	95,494	93,698	2,263	17.00	91,224,410	1.0000
2018	37	1275	826	24.3	86,470	78,504	552,675	395.00	86,635,672	1.0000
2019	37	1275	1,086	107.16	48,262	48,830	1,514,679	467.50	94,331,470	1.0000
2020	37	1275	1,076	109.45	12,188	35,699	645,902	227.25	82,628,300	1.0000
2017	38	1071	1,324	430.7	94,623	374,904	268,288	237	3,107,176	1.0000
2018	38	1071	1,416	430.7	81,773	289,099	61,335	118	3,940,275	1.0000
2019	38	1071	583.11	86.31	69,055	252,908	159,215	156	3,128,289	1.0000
2020	38	1071	1,076	109.45	70,992	261,113	118,843	170	1,621,928	1.0000
2017	39	1274	768.52	147.66	69,133	208,282	130,870	237	5,535,594	1.0000
2018	39	1274	3,290	113.0075	115,437	401,286	128,878	284	5,900,634	1.0000
2019	39	1274	856	155.71	117,269	345,558	76,723	360	5,606,525	1.0000
2020	39	1274	936	153.00	173,841	665,817	257,052	407	6,164,568	1.0000
2017	40	1071	1,535	94.51069417	108,288	1,298,736	517,903	168	8,071,937	1.0000
2018	40	1071	1,516	88.44292282	319,362	2,205,165	21,660	109	6,916,588	1.0000
2019	40	1071	1,305	79.58875089	446,642	3,146,388	376,292	639	7,132,268	1.0000
2020	40	1071	1,051	66.28135918	396,018	2,153,324	215,036	273	7,292,713	1.0000
2017	41	1360	293.00	129.7	1,061,840	1,462,076	294,503	232	5,330,507	1.0000
2018	41	1360	271.75	118.3	672,259	887,967	36,480	260	5,765,430	1.0000
2019	41	1360	583.11	86.31	176,340	295,111	20,100	542	6,922,609	1.0000
2020	41	1360	625.29	92.88	145,020	149,674	19,734	234	8,545,243	1.0000
2017	42	1403	467.0742317	104.0726	399,215	642,272	56,533	165	19,650,078	1.0000
2018	42	1403	825.87	24.3	1,775,213	2,707,173	326,657	382	28,383,445	1.0000
2019	42	1403	753.28	45.8	1,799,433	3,299,225	77,848	387	31,190,599	1.0000
2020	42	1403	595.47	54.0	3,151,436	5,169,015	155,929	222	26,408,041	1.0000
2017	43	1143	1,103.00	16.7	154,630	72,144	500,701	21	157,131,669	1.0000
2018	43	1143	825.87	24.3	164,499	69,205	1,074,981	97	164,799,254	1.0000
2019	43	1143	753.28	45.8	27,360	13,187	5,110,250	155	146,527,560	1.0000
2020	43	1143	45,724	96.70579882	96	99	1,461,032	147	160,108,193	1.0000