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DOES ECONOMIC CRIMES AFFECT KENYA'S ECONOMIC GROWTH? A COINTEGRATION APPROACH

Angelah Bett
MSc Student, Jomo Kenyatta University of Agriculture and Technology, Kenya
betangelah@gmail.com

Willy Muturi
Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya
wmuturi@ihrd.jkuat.ac.ke, mmuturi2001@gmail.com

Abstract

The global economy is faced with myriad of endemic economic crimes that increase in magnitude and dimension daily that have devastating effects on the wellbeing, security and the economy of any state. Yet, existing studies reach divergent conclusions that economic crimes could be growth-enhancing while conclude it is growth-reducing leaving a huge literature. There is a dearth of literature if any on the effect of economic crimes on Kenya's economic growth. The study employed dynamic ordinary least square, nested in the Engle-Granger cointegration econometric analysis, to empirically estimate the relationship between economic crimes and economic growth using data from the Kenya National Bureau of Statistics, Global Financial Integrity, World Bank and Transparency International from the period 2000 to 2014. Findings show a strong negative and statistically significant relationship between illicit financial flows and economic growth in Kenya both in the short and long run. However, finding on the relationship between corruption and money laundering were inconclusive. These recommends tightening existing regulatory gaps to close used by criminals to transfer illicit finances and launder money. The study also recommends the establishment of a multi-agency approach involving both domestic public and private; and international actors to combat economic crimes.

Keywords: Economic Crimes, Economic Growth; Illicit Financial Flows; Money Laundering

INTRODUCTION

Economic crimes have potentially devastating effects on the economic growth, security and wellbeing of a country. The global economy, for example, continues to be faced with myriads of socio-economic problems that increase in magnitude and dimension daily. Suicide bombings and killings, terrorism and insurgencies, drug trafficking, smuggling, money laundering, and systemic corruption are some of those crimes that threaten the corporate existence of many countries of the world today. While some of the challenges are social in nature, crimes that are economic in nature are known as economic crimes. They are either committed in the course of legitimate duties or illegitimate transactions by an individual or a group to gain financial or professional advantage but always have far reaching negative effect on the health of a country's economy (Gaibulloev & Sandler, 2008).

Economic crimes are diverse and come in different forms: cybercrime, the Customs officer who undervalues duties on imported goods with the objective of sharing a reasonable part of the waived duty with the importer, the accountant who alters figures in the preparation of vouchers and pockets the difference, the bank official who connives with a money launderer to conceal the origin and source of the funds deposited in his bank are all involved in economic crimes. The consequence of these crimes is devastating on the economy of any state. The channels of transmission include, but are not limited to, a direct rise in the cost of doing business, a decline in competitiveness, a discouragement of foreign investment, a diversion of (private and public) funds towards crime prevention activities that reduce productive capacity, and a limited investment in human capital accumulation (Neanidis & Papadopoulou, 2013).

Yet Kenyan has literally sustained a growing bandit economy that runs parallel to the weak formal economy despite concerted efforts and a range of interventions by the government to tame rising cases of economic crimes. While Kenya has historically experienced varied forms of economic crimes, the period 2000-2015 pointed to apparent spike of these crimes despite numerous interventions by the government. Figures from the Kenya National Bureau of Statistics (KNBS) show that economic crimes grew by 133% in the period over the last ten years. Similarly, data from the Global Financial Integrity (GFI) show that illicit financial flows from Kenya grew sharply by 255% over the same period. Moreover, the number of major corruption cases increased by 52% between 2005-2015 and is estimated to lead to 3% (or US $910 million) loss of Gross Domestic Product (GDP) annually.

The government's response to this phenomenon included legislations such as the Security Laws (Amendment) Act, 2014 which amended a suite of security related laws to combat economic crimes among other security threats. Other laws include the Proceeds of Crime and Anti Money Laundering (Amendment) Act, 2012 which established the Financial

Reporting Centre and the Ethics and Anti-Corruption Commission Act, 2011 which established the Ethics and Anti-Corruption Commission pursuant to Article 79 of the Constitution. Kenya is also a member of the Eastern and Southern Africa Anti-Money Laundering Group, a Financial Action Task Force (FATF)-style regional body. Kenya made progress in implementing its anti-money laundering/countering the financing of terrorism regime with the Financial Reporting Center making progress in monitoring the financial system and reporting of suspicious transactions.

Moreover, as a result of the association between economic crimes such as money laundering and terrorist financing, Kenya has continued to face a significant threat from trans-border terrorist attacks from Somalia and other criminal elements, as evidenced by the 1997 US embassy attack by Al Qaeda, September 2013 Westgate Mall, the Mpeketoni and Garisa university Al Shabaab attacks that killed hundreds of civilians and destroyed millions of property. Economic crimes have been surging in the recent past partly due to resurgence of terrorism, technology explosion and associated cybercrime and perhaps improved compilation crime statistics.

The resultant effect has been decline in critical sectors of the economy such as tourism which has witnessed continued negative growth in recent times (Figure 1). Moreover, the negative publicity which accompanies such events dampens the country's investment climate and consequently discouraging domestic and foreign direct investments.

Figure 1: Trends in Economic Crimes and Tourist Arrivals

Source: Kenya National Bureau of Statistics (KNBS)

Literature on the relationship between economic crimes and economic growth continues to generate a rich debate, (Detotto & Otranto, 2010; Ffolkes-Goldson, 2015; Bingzhi & Yunfeng, 2009). However, researchers have come up with divergent conclusions that economic crimes could be growth-enhancing and others who see it as growth-reducing. Yet the broad assumption is that economic crimes have devastating effects on a country's economic performance. This position is affirmed by scholars such as (Gaibulloev & Sandler, 2008; Bartlett, 2002) who argue that money laundering damages the financial-sector institutions that are critical to economic growth, reduces productivity in the economy's real sector by diverting resources and encouraging crime and corruption, which slow economic growth, and can distort the economy's external sector—international trade and capital flows—to the detriment of long-term economic development. The converse argument is that of (Asian Development Bank, 2003) who put across an argument for short term economic benefits of economic crimes especially money laundering particularly for countries that condone this illegal act. Moreover, developing countries can become favored from large scale money launderers for short periods of time causing a sharp surge in financial activities (IMF, 2001; Fiorentini & Peltzman, 2004).

Other studies have tried to estimate the direct and indirect costs of crime on the society (McCollister, *et al.*, 2010; Anderson, 1999). However, the results indicate that a clear conclusion on the association is yet to be reached. Many studies report that crime has a very significant negative influence on economic growth (Cárdenas, 2007; Peri, 2004;Gaibulloev & Sandler, 2008), whereas other conclude that the effect is unclear (Goulas & Zervoyianni, 2012; Burnham, *et al.*, 2004) or even absent (Mauro & Carmeci, 2007;Ray & Chatterjee, 2009).

Yet the reality in Kenya does not seem to support the argument that economic crimes are growth enhancing. Indeed, the exponential growth in economic crimes in recent times coinciding with drastic declines in key sectors of the economy such as tourism is a testament that economic crimes have distorted investment and economic productivity leading to increased risk of macroeconomic instability. What seems apparent therefore are economic loses from the Kenya perspective.

Conservative statistics show that Kenya consumed over 335,000 metric tons of illegal sugar in the period 2010-2015, (Kenya National Assembly, 2015). This has caused market distortions resulting in unfair price competition to the disadvantage of local sugar millers and cane farmers. According to (Leblanc & Kar, 2013), Mumias Sugar Company, which is responsible for over 60% of Kenya's domestic sugar production, named smuggling as a contributing factor to the company's pre-tax losses of $26m in 2013. Leblanc & Kar, (2013) further show that since 2006, nearly $10 billion worth of goods have been smuggled into the country. It is estimated that nearly one out of every six dollars' worth of goods imported into

Kenya goes unreported to customs authorities leading to a loss of a sizable amount of revenue further exacerbating fiscal challenges and by extension financing of critical infrastructure projects. Using Leblanc & Kar, (2013) estimates an astounding 12% of the total tax revenue is lost every year.

This study seeks to grapple with this debate by responding to three core issues. Foremost, what is the nexus between economic crimes and growth in Kenya? Secondly, what are the implications of money laundering on Kenya's economy? Thirdly, what explains the apparent growth of illicit economic activities despite a broad range of measures by the government? Fourth, what are the consequences of surging corruption cases on Kenya's economy? And lastly, provide policy recommendations on how this phenomenon can be contained?

LITERATURE REVIEW

The classical growth theory suggests that the way income is distributed among classes in the society determines whether growth occurs or how growth proceeds. Therefore, growth is expected to flow from the distribution of income. High level of corruption distorts the allocation of public resources and leads to a more unequal distribution of income. Gupta, *et al.,* (2001) in a study on corruption, inequality and poverty observed that high levels of economic crimes produce a more unequal distribution of income under some conditions, but the mechanism may be complex operating through lower investments in education and lower per capita incomes. Rotimi, *et al.,* , (2013) assert that there are strong indications that the changes in income distribution that have occurred in recent years in previously centrally planned economies have been partly the result of corrupt actions.

Similarly, the circular flow of income posited by John Maynard Keynes is such that the leakage that the Government sector provides is through the collection of revenue through taxes that is provided by households and firms to the government. However, economic crimes involving tax evasion through transfer pricing and commercial misinvoicing present another leakage that could also shrink tax revenue. Other leakages may come in the form of banks acting as conduits for money laundering, or government revenue which could have otherwise been spent in infrastructure and healthcare being stolen by public officials. In a small open economy such as Kenya, the next sector in the circular flow of income model is the external sector. The main leakages from this sector involve either or both over-invoicing of export and under invoicing of imports which deprive an economy of vital income.

In an empirical research which aimed to find out the reasons of deceleration of Colombia's economic growth, Cárdenas, (2007)observed that productivity loss due to increasing levels of crime, specifically homicide rates due to increasing drug-trafficking was the reason for economic progress. Fabayo, *et al.,* (2011) in their study analyzed the consequences of economic crime on investment in Nigeria using OLS technique and annual Corruption Perception Index (CPI) between the period 1996 and 2010 as proxy for economic crimes. Their study revealed that low CPI ranking on Nigeria, which implies high level of corruption, leads to low investment and thus low economic growth in Nigeria.

Akindele, (2005) undertook an empirical investigation using a modified production function that includes labor, capital and political instability, corruption index as variables. His findings show that there exists a strong significant negative relationship between economic crime and development. However, the study considered a limited period limiting the reliability for such conclusions to be drawn. Nageri, *et al.,* (2013) while adopting OLS technique tested the hypothesis that CPI affects economic development (GDP) and found the result to be statistically significant implying that economic crime negatively affects economic development. Gaibulloev & Sandler, (2008) measured the impact of domestic and transnational terrorism on income per capita growth in the period 1971-2004 in a panel of 18 Western European countries and concluded that there is a negative but significant relationship between crime variables (economic costs of domestic and transnational crimes) and income per capita growth.

Narayan & Smyth, (2004) used the Granger Causality Test within an Auto Regressive Distributed Lag (ARDL) Model to determine the relationship between different crime typologies (arms trafficking and human trafficking) on the one hand and real wage rate and unemployment in Australia. The study finds that proliferation of arms and human trafficking worsened unemployment and wage rate. The study links increase in participation in crime to proliferation of arms, which breeds unemployment as the number of prison sentences increases.

Adewale, (2011)using a cointegration approach finds a strong significant negative relationship between economic crime and output growth in Nigeria. He estimated the econometric parameters of the variables which included Gross Domestic Product (GDP) as the dependent variable and Gross Capital Formation (GCF), Money Supply (MS), Public Domestic Investment (PINV), Corruption Perception Index (CPI), bank fraud, External Debt (EXTD) and Unemployment Rate (UNEMPL) as the explanatory variables, and concluded that economic crime has a crowding-out effect on growth within the period of 1996-2009.

Illicit financial flows out of Africa have become a matter of major concern due to the scale and negative impact of such flows on Africa's development, security and governance agenda. Kar & Cartwright-Smith, (2010) estimated such illicit financial flows from Africa to about

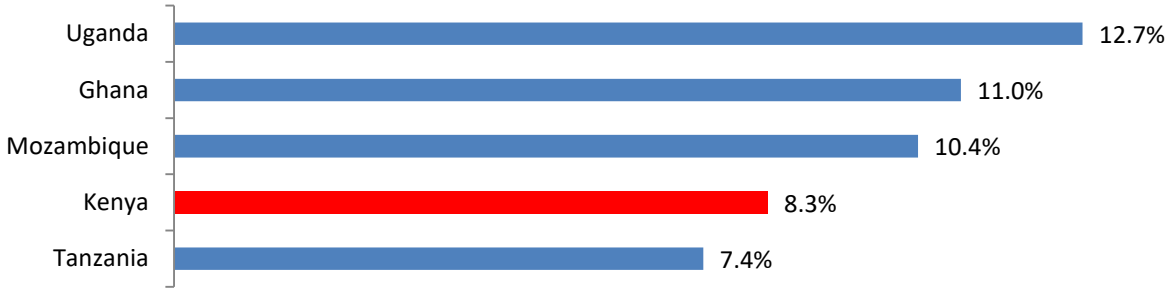
USD 854 billion, between 1970 and 2008. This cumulative amount is considerable and equivalent to nearly all the official development aid (ODA) received by Africa during the 39 year period Kar & Cartwright-Smith, (2010). From a different perspective, only one-third of the loss associated with IFF would have been enough to fully cover the continent's external debt that reached USD 279 billion in 2008 (UNECA, 2014a). The main reasons for continuing capital flight are illicit motives such as tax evasion and the concealment of corruption (Ndikumana, 2013). However, consensus among researchers on the effect of IIFs is yet to be reached. For example, as stressed by Blankenburg & Khan, (2012) some types of IFF can lead to additional capital inflows into the country of origin.

To gauge the extent to which the investment-inhibiting effect of IFFs impacts economic growth, Ndikumana, (2013) used data from a number of African developing countries to conduct an econometric simulation. The central question of the counterfactual study is how much additional growth the affected countries might have achieved without illicit financial outflows. Ndikumana concludes that the thirty-nine countries studied over the period 2000-2010 might have been able to achieve on average 3 per cent more economic growth had there been a radical stop to all IFFs.

The role of IFFs and their adverse effect on the country's GDP cannot be ignored. According to UNECA, (2014b), Kenya is believed to have lost as much as $1.51 billion from 2002-2011 to trade misinvoicing. A recent study funded by the Danish government on five of its priority countries (Ghana, Kenya, Mozambique, Tanzania and Uganda) shows that Kenya's tax loss from trade misinvoicing by multinational corporations and other parties could be as high as 8.3 per cent of government revenue, hampering economic growth and resulting in billions in lost tax revenue. The report further notes that in Kenya alone approximately $440,000 worth of taxable revenue is lost per month to fraud.

Trade misinvoicing is the most damaging economic condition in Africa today. Misinvoicing of international trade transfers and the resulting falsification of import letters of credit and customs declaration can conceal cross-border transfers of, say, the proceeds of chug trafficking , (Quirk, 1996). For instance, GFI asserts that roughly $1 trillion flows illegally out of developing countries annually due to crime, corruption and tax evasion— close to ten times the amount of foreign aid flowing into these same economies. Clough *et al.,* 2014) emphasized the blight of trade misinvoicing within Ghana, Kenya, Mozambique, Tanzania and Uganda and its negative impact on the national revenue. In particular, with conservative estimates, Kenya loses up to 8.3 percent of its national revenue annually to trade misinvoicing, (Figure 2).

Figure 2: Government Revenue Loss from Trade Misinvoicing as % of Government Revenue, 2002-2011



Source: Global Financial Integrity

Grand corruption in Kenya has been rising and may reach catastrophic levels in the near future if not curtailed. Kenya's corruption rating, CPI, by the transparency international has been deteriorating over the years pointing to a problem that may soon become a disaster. LeBlanc, (2013) finds that Poor countries hemorrhaged nearly a trillion dollars from their economies in 2011 that could have been invested in local businesses, healthcare, education, or infrastructure. Corruption around the world is facilitated by the ability to launder and hide proceeds derived from the abuse of power, bribery and secret deals. For example, a survey by the World Bank reveals that corrupt politicians used secret companies to obscure their identity in 70 percent of more than 200 cases of grand corruption.

Ekundayo, *et al.,* (2013) in a study to analyze corruption and economic growth in Nigeria using GDP as the dependent variable and corruption, previous degrees of corruption and corruption perception index for Nigeria as explanatory variables using OLS concluded that corruption impairs economic growth. This study failed to identify any scope or even identify the sources of data and so the reliability of data and result drawn there from are put in doubt. Moreover, like other previous studies corruption perception index is just the perception of individuals with regard to corruption and this perception is largely subjective with minimal time points.

Ahmad, *et al.,* (2012) using panel data from 1984 to 2009 for 71 developed and developing countries, with corruption index, corruption squared, bureaucratic efficiency index, political stability index, institutional efficiency index, risk to investment index while employing generalized methods of moments estimation (GMM) find that decrease in corruption raises economic growth rate in an inverted U-shaped way.

Aidt, *et al.,* (2008), in an empirical study employing panel data techniques using accountability index, corruption index and GDP as variables found a non-linear relationship

between corruption and growth and therefore concluded that there is no relationship between corruption and growth in countries with low-quality political institutions.

RESEARCH METHODOLOGY

Data Source

Annual time series data was sourced from the Global Financial Integrity database, the World Bank database, Transparency International database, the Kenya National Bureau of Statistics database and the Central Bank of Kenya database for the period 2000-2014. Particularly, the real gross domestic product, ($RGDP$), and inflation ($INFL$) were obtained from the Kenya National Bureau of Statistics, while nominal exchange rate (EXR) and interest rates ($LRATE$) data were obtained from the Central Bank of Kenya. The Corruption Perception Index (CPI) was obtained from the Transparency International complemented by the same measure from the World Bank database. Finally data on money laundering (ML) and illicit financial flows (IFF) were obtained from the Global Financial Integrity database. The data was splicied to obtain quarterly series using the quadratic-match-sum technique in Eviews.

Model Assumptions and Preliminary Data Analysis

For econometric techniques that utilize time series data, it is essential to distinguish that unless the diagnostic tools used account for the dynamics of the link within a sequential 'causal' framework, the intricacy of the interrelationships involved may not be fully confined. As Gujarati, (2005) stated, most of macro econometric time-series data are associated with the problem of non-stationarity as the data set may have time-varying mean or time-varying variance or suffer from both leading to spurious results. The stationarity property of the time-series data was examined by conducting unit root test in order to ascertain the stationarity or otherwise of the series variables. To detect the presence or otherwise of unit root of a variable Y that has a unit root represented by a first order Autoregressive (AR) is represented as follows;

$Y_t = \rho Y_{t-1} + \mu_t$

Where, Y_t is real GDP at time t, $\mu_t$is the error term assumed to be independently and identically distributed with zero mean and constant variance and also assumed to be serially uncorrelated. If the absolute value of the coefficient p is less than 1 (|p| < 1), then Y_t is stationary. If on the other hand, the absolute values of the coefficient p is statistically equal to or greater than 1 (|p| ≥1) then Y_t is non-stationary and unit root exists (Gujarati, 2008). To make variables of this study stationary the Augmented Dickey-Fuller (ADF) unit root test was used (Dickey & Fuller, 1979).

The ADF test here consists of estimating the following regression:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-i} + \varepsilon_t$$

The ADF tests the null hypothesis that a time series is I(1) against the alternative hypothesis that is I(0).

H_0: γ = 0: variable is non-stationary at level, however, stationary at their first difference,

H_1: γ ≠ 0: variable is stationary at level.

If the null hypothesis is rejected it means that the variable is stationary otherwise the series is non-stationary at level and should be differenced to make it stationary. Further, the Phillips & Perron, (1988) nonparametric statistical method was used to take care of the serial correlation in the error term.

Normality test

To establish the normality or otherwise of the variables of the study, the study employed the Jargue-Bera test where a null hypothesis of normality is tested against the alternative hypothesis of non-normal distribution. Non-normality would imply that the estimators are not standard and therefore the inferences drawn from the result would not be reliable. The hypotheses to be tested would be as follows;

H_0: JB = 0 (normally distributed)

H_1: JB ≠ 0 (not normally distributed)

The general rule of the thumb is that a rejection of the null for any of the variables would imply that the variables are not normally distributed and a logarithmic transformation is necessary. From Table 1 it's inferred that the JB statistic is statistically significant from zero implying that the variables are not normally distributed.

Table 1: Descriptive Statistics

	CPI	EXR	IIF	INFL	LRATE	ML	RGDP
Mean	0.553125	79.77400	56.34453	8.284308	15.97965	25.51672	605003.7
Maximum	0.694531	103.8946	153.6168	19.18748	21.28120	75.97875	1030912.
Minimum	0.467188	62.95298	21.82609	1.229453	12.20293	2.723750	230462.0
Std. Dev.	0.062247	8.140854	33.77963	4.692917	2.651771	16.50383	282219.7
Skewness	0.861196	0.660431	1.944118	0.759301	0.429970	2.152607	-0.173152
Kurtosis	2.664166	3.839481	5.585768	2.670143	1.860814	6.451160	1.446916
Jarque-Bera	8.211781*	6.531752*	58.14556*	6.439881*	5.432644	81.18766*	6.751989*

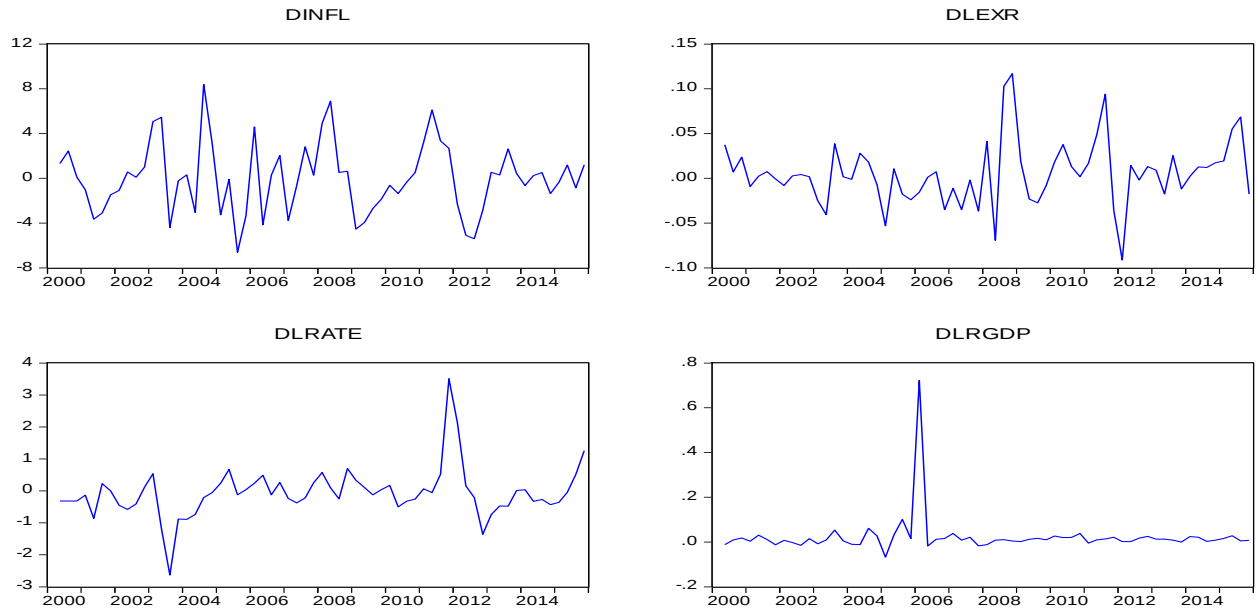
* Statistically significant at 5%

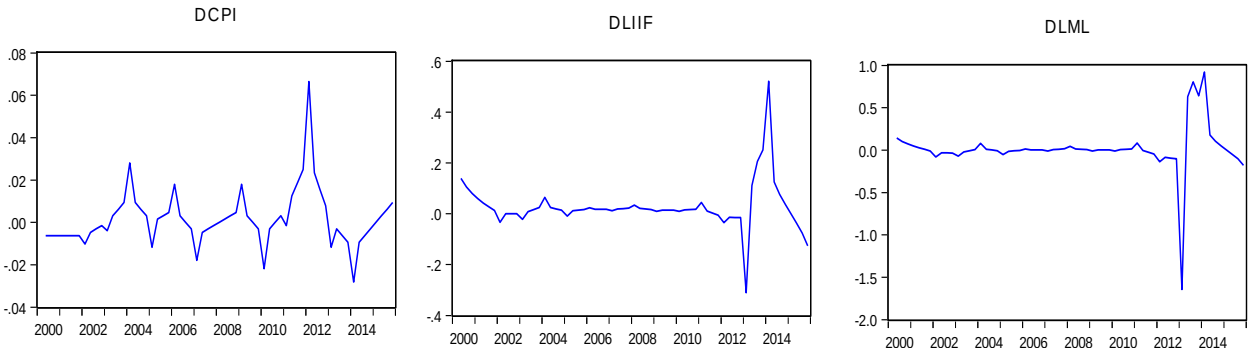
The series were log-transformed due to non-normality. Figure 3 plots quarterly change in inflation, DINFL; percentage change in nominal exchange rate, DLEXR; change in corruption perception index, DCPI; percentage change in illicit financial flows, IIF; change in interest rates, DLRATE; percentage change in money laundering DLML; and percentage change in real national income (GDP), DLRGDP. Heightened volatility in inflation was witnessed between 2003 and 2008; 2012 and later in 2015. This volatility could be associated with increased government expenditure on infrastructure and social services after regime change between 2003 and 2007. Thereafter the global shock of the financial crisis and debt crisis in the US and EU respectively resulted in volatility between 2007 and 2012. This effect was passed through exchange rates, DLEXR, from import of consumables and capital equipment to the domestic economy.

Interest rates, DLRATE, responded to these volatilities as monetary policy was tightened to arrest runaway inflationary pressure. This explains the almost similar movement between inflation, exchange rates and interest rates. Output, DLRGDP, has been operating at its long-run equilibrium except that there is a spike in 2006 quarter one. This is associated with the rebasing of GDP to 2009 from 2001. The series has been back casted to 2006 quarter one, therefore periods before 2006 quarter one have 2001 as their base. Money laundering, DLML, quite closely follows the movement in illicit financial flows, DLIIF. The magnitude of these economic crimes seems to be on a rise with spikes recorded between 2012 and 2015.

The movement in corruption perception index, DCPI, follows a dammed sine wave recording a similar pattern to DLIIF and DLML between 2012 and 2015. The co-movements in the various series could suggest that DLRGDP, DLIIF, DLML, DINFL, DLEXR and DLRATE might be cointegrated.

Figure 3: Full-sample multiple graphs at first difference





Testing for Stationarity Using ADF Test

The null hypothesis of existence of a unit root could not be rejected for all variables except INFL at level suggesting that they are integrated of order one, I(1). However, stationarity was achieved at first difference for these variables confirming that they are I(1) as shown in Table 2. For RGDP, the ADF test in first difference shows that neither the trend nor the constant are significant and are therefore dropped the test null hypothesis that RGDP has a unit root is rejected, (*p*-value is 0.0054) confirming that RGDP is integrated of order one, I(1). Similarly, the ADF *t*-statistic for IIF reveals that the series does not contain a drift or a time trend as the deterministic terms in the ADF equation are not significant. They are therefore are not entered. The test at first difference confirms the results at level. The ADF test statistic is -3.590272; *p*-value is 0.0005.

Comparable results are found for CPI at first difference reveal that the ADF *t*-statistic is -4.047318 and *p*-value is 0.0131 implying that CPI is I(1) with no drift or trend. Additionally, ML is found to be an I(1) with no drift and time trend. ADF *t*-statistic is -1.945817 whereas *p*-value is 0.0501 at first difference. With the exception of inflation which was found to be I(0) all other control variables are I(1). The ADF *t*-statistic for INFL is -4.494646 whereas the *p*-value 0.0006 suggesting that it is integrated of order zero. Results at level also show that INFL has a drift. The ADF *t*-statistic for EXR is -6.473735 and the *p*-value is 0.000 at first difference implying that EXR is I(1). Lastly, the ADF *t*-statistic for LRATE is -4.060227 whereas *p*-value is 0.0001 at first difference suggesting that LRATE is I(1). Both EXR and LRATE have no drift or time trend.

Confirmatory tests (not presented here) were carried out using the Kwiatkowski-Phillips-Schmidt-Shin, (KPSS) test to confirm the conclusions about unit roots from ADF tests. Maddala and Kim (1998) argue that, despite this limitation, using both tests together may be better than using either test alone. Although not presented here for avoidance of lengthy appendices, results confirm the findings of the ADF test.

Table 2: ADF Tests

Variable	Lag Length	DW Statistic	**ADF Test Statistic, critical value & p-value	Decision
RGDP	3	2.027134	-2.829947[-1.946447](0.0054)	I(1)
IIF	0	2.028703	-3.590272[-1.946161](0.0005)	I(1)
CPI	11	1.783642	-4.047318[-3.500495](0.0131)	I(1)
ML	8	2.000426	-1.945817[2.608490](0.0501)	I(1)
EXR	0	1.910635	-6.473735[-2.602794](0.0000)	I(1)
INFL	6	1.992214	4.494646[-2.913549](0.0006)	I(0)
LRATE	0	1.706907	-4.060227[-1.946161](0.0001)	I(1)

**: ADF test statistics at first difference, ADF critical value, [ ]:P-value, ( ): DW: Durbin-Watson statistic, I (0): Integrated of order zero and I (1): Integrated of order one

Model Specification

OLS cannot be used in estimating the model since the results of the standard OLS *t*-values are unreliable in the presence of I(1) regressors. For that reason, Hayashi (2000); and Stock and Watson (2007), present estimation results for cointegrating regression without standard errors. Their argument is that the OLS estimators of the cointegrating coefficients have a non-normal distribution and their *t*-statistics are not normally distributed, in which case presenting standard errors (heteroskedasticity and autocorrelation consistent (HAC) or otherwise) would be misleading. Given the aforementioned reasons, the first step Engle-Granger long run model is estimated using Dynamic Ordinary Least Squares (DOLS) approach. The model introduced a dummy variable, DUM, to deal with the problem of outliers in a number of series in the study.

The cointegration methodology was chosen to establish the existence or otherwise of both short run and long run relationships. Cointegration is a statistical property of time series variables if they share common characteristics of stationary. Johansen cointegration developed by Johansen and Juselius (1990), which is used for the existence of long-run relationship among the variables under the assumption that they are stationary at the same order of integration. This approach also estimates the coefficients of variables along with the existence of long-run relationship among the underlying series.

Moreover, Stock and Watson (2007) suggest three ways of deciding whether two (or more) variables can plausibly be modelled as cointegrated: (i) use expert knowledge and economic theory; (ii) graph the series and see whether they appear to move together in such a way that a linear combination of them is stationary; and (iii) perform statistical tests for cointegration. Foremost, there are good theoretical reasons to expect a cointegration relation between economic crimes DLIIF, DLML, DCPI and economic growth, DLRGDP. Secondly,

results in Figure 3, shows that there is a common trend between the variables save for the structural break in RGDP on account of rebasing.

The specification of the model to be estimated is as follows:

$$\Delta \ln(RGDP_t) = \alpha + \beta_1 \Delta(CPI_t) + \beta_2 \Delta \ln(ML_t) + \beta_3 \Delta \ln(IIF_t) + \beta_4 \Delta(INFL_t) + \beta_5 \Delta \ln(EXR_t) + \beta_6 \Delta LRATE + \varepsilon_t$$

Where, $RGDP$ is the real gross domestic product; α is a constant; $\beta_1, \beta_2, ..., \beta_5$ are the parameters to be estimated; CPI is corruption measured by corruption perception index; ML is money laundering; EXR is nominal exchange rate; IFF is illicit financial flows; $INFL$ is a inflation, and $LRATE$ is interest rate. The $\mathrm{k\,x\,1}$ error vectors of the error term, (ε_t), are assumed independent and identically distributed with a mean of zero, $E(\varepsilon_t) = 0$ and a constant variance, $Var(\varepsilon_t) = I_k$, where I_k is the identity matrix of order k.

EMPIRICAL RESULTS

The Engle and Granger (1987) two-step procedure

Results from the long-run model are presented in Table 3. As expected DLIIF has a strong negative effect on economic performance. The coefficient is -0.769 and the *p*-value is 0.002. This finding is therefore statistically significant at the 1% level. The results are at level implying that the effect of illicit financial flows on economic growth is realized at the current period.

The broad assumption was that money laundering has devastating effects of a country's economic performance. This position is affirmed by scholars such as (Bartlett, 2002) who argue that money laundering damages the financial-sector institutions that are critical to economic growth, reduces productivity in the economy's real sector by diverting resources and encouraging crime and corruption, which slow economic growth, and can distort the economy's external sector—international trade and capital flows—to the detriment of long-term economic development.

However, findings confirm the converse argument that of (Asian Development Bank, 2003) who put across an argument for short term economic benefits of economic crimes especially money laundering particularly for countries that condone this illegal act. Results show that money laundering, DLML, has a positive effect on economic growth. This violates postulations of economic theory that economic crimes have a negative effect on growth. The effect is however weak with a coefficient being 0.18 and *p*-value is 0.014. This implies that the effect of DLML on economic growth is statistically significant at the 1% level.

Moreover, developing countries can become favored from large scale money launderers for short periods of time causing a sharp surge in financial activities (IMF, 2001; Fiorentini & Peltzman, 2004). If laundered money either does not leave the country of origin or finally reverts back to the country of origin then there is a good chance that it will be used in productive activities. Therefore this may lead to a positive effect on economic growth. Additionally, at the integration stage of money laundering, criminals apply the proceeds into legitimate economic activity. This could result in a positive effect on economic growth.

Notably however, the effect of DCPI on DLRGDP is not significant. Although it has the expected negative sign, (coefficient is -0.963), the *p*-value is 0.172>0.05. The coefficient was not significant even after trying several lags using the general to specific procedure. This finding could be attributed to the nature and quality of data. CPI data is a perception index gathered by the Transparency International. By construction, this index may suffer from subjective perceptions of the respondents.

The effect of exchange rate volatility, DLEXR, on economic growth was found to be positive with a coefficient of 0.513. However, this finding was found to be borderline significant, *p*-value is 0.056. This finding could be attributed to the fact that either swings, (appreciation or depreciation), could potentially support economic activity. Depreciation for example enhances competitiveness of the country's products in the international market thereby encourages exports while prohibiting imports. This enhances the level of incomes of domestic productive sectors. The flipside is also true as exchange rate appreciation reduces the countries import bill of capital equipment and other intermediate goods required to support domestic productive sectors.

As expected, interest rates, DLRATE, has a negative effect on economic growth. The coefficient is -0.049 and the *p*-value is 0.002<0.05. This implies that the effect of interest rates on economic growth is statistically significant at the 1% level. This is supported by economic theory as a rise in the cost of capital constraints expansion of firms and curtails innovation consequently leading to a slow-down in economic activity.

Similarly, the effect of inflation, DINFL, on economic growth is negative. The coefficient is -0.011 with *p*-value of 0.001<0.05. Inflation influences economic performance after two period, (inflation enters the equation with a lag of 2 periods or quarters). This finding is attributed to the fact that inflationary pressure is associated with rising cost of doing business, depressed capacity and even layoffs arising from the need to cut down on cost. This finding confirms the effect of interest rates on economic performance. Usually, monetary authorities and central banks raise interest rates to accommodate inflationary pressure. Therefore, theoretically interest rates and inflation have a similar effect on economic growth.

The estimated long run model is quite reliable as indicated by the diagnostic statistics. The adjusted R-squared is strong implying that the variables under consideration explain 48 percent of the variation in economic growth. The long run variance is low, 0.005, implying a long run convergence. Moreover, the Durbin-Watson statistics is 1.73, implying minimal if any serial correlation.

Table 3: Estimation of the Cointegrating Model – Dynamic OLS: Dependent Variable DLRGDP

Explanatory Variable	**Coefficient**	**p-value**
DLIIF	-0.769423*	0.0022
DLML	0.179559*	0.0138
DCPI(-3)	-0.962605	0.1724
DLEXR	0.513351***	0.0560
DLRATE	-0.049067*	0.0019
DINFL(-2)	-0.010697*	0.0010
Constant	0.011829	0.2359
DUM	0.351679*	0.0000

Statistic	**Value**
R^2	0.541968
Adjusted R^2	0.480310
DW Statistic	1.734442
Long-run variance	0.004622

* Statistically significant at 1% level, ** statistically significant at 5% level, *** statistically significant at 10% level DW statistic is Durbin-Watson statistic, and the (-) in parenthesis indicates the lag operator. DLIIF is the differenced logged Illicit Financial Flows; DLML is the differenced logged Money Laundering Series; DCPI is the differenced series of Corruption Perception Index; DLEXR is the differenced logged Exchange Rate series; DLRATE is the differenced logged Interest Rate series; DINFL is the differenced Inflation series and DUM is the Dummy variable.

CONCLUSIONS AND RECOMMENDATIONS

The thrust of this study was to determine the effects of economic crimes on economic growth in Kenya. The study contributed in filling an important knowledge gap in Kenya by contributing empirical evidence on the impact of economic crimes on Kenya's economic growth at a period when an apparent surge in economic crimes continues to raise concern.

Findings from the long-run model revealed that the DLIIF has a strong negative and statistically significant effect on economic performance at level. The study therefore rejected the

null hypothesis that IIF no significant effect on economic growth. The finding therefore leads to the conclusion that illicit financial flows have a derail Kenya's economic growth. Although unexpected, results showed that DLML has a positive but weak relationship with DLRGDP. On the basis of this finding therefore the study rejected the null hypothesis that there is no significant effect between money laundering and economic growth. These findings are therefore inconclusive as economic theory and empirical studies elsewhere support a negative association between money laundering and economic growth.

Despite having the right sign, DCPI on DLRGDP was not found to be significant. This finding could be attributed to the fact that CPI data is a perception index gathered by the Transparency International and the World Bank. Therefore, by construction this index may suffer from subjective perceptions of the respondents. Given this finding, the study failed to reject the null hypothesis that CPI does not have a statistically significant effect on Kenya's economic growth. This finding is therefore inconclusive as previous empirical studies have shown a statistically significant relationship between corruption and economic growth. Moreover, economic theory suggests that there is a negative association between corruption and economic growth.

Based on the findings, the study recommends that the government should develop effective measures to track, stop and get all illicit financial flows. This should be a well-coordinated multi-agency framework bringing together all agencies involved both nationally and internationally. This therefore requires high level cooperation and information sharing both domestically and internationally. Additionally, the study recommends that concerted efforts should involve the private sector as such partnerships could yield better results given that private entities are used as conduits to channel proceeds of corruption and other illicit flows. Lobbying the private sector should be encouraged by showing that illicit financial flows undermine the private sector by stifling business and entrepreneurship and significantly reducing structural transformation and economic diversification. This in turn increases the cost of doing business and limits the ability of private sector to grow.

Thirdly, the government should develop robust regulation and sealing all loopholes that create avenues for illicit financial flows. For instance regulations should explicitly prohibit either holding accounts or transferring finances to countries with bank secrecy. To be able to implement such recommendations, human and technical capacity should be built and special agencies or government departments tasked with such mandates. Lastly, future studies could be carried out using panel methodologies. With rich data beginning to emerge, a panel study of East African or Sub-Saharan African countries could be carried out. This will richly inform the dynamics of economic crimes and economic growth in the region.

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