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THE IMPLICATION OF THE CBN CASHLESS ECONOMY POLICY CHANNELS ON THE PERFORMANCE OF NIGERIAN BANKS

Original Research

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Earnings per share;
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B22; E58; G20

Abstract

This study appraised the implications of CBN cashless economy policy on the performance of banks in Nigeria with specific attention on the effect of automated teller machine, point of sale and web-based transaction on earnings per share. Vector error correction model was used to estimate quarterly data collected on the variables from 2010 to 2018. It was deduced from the analyses that automated teller machine, point of sales and web-based transaction had a long-run effect on earnings per share. However, the short-run disequilibrium in the data set was not adjusting towards long-run equilibrium. This implied that the electronic banking transaction modes jointly influence the earnings per share of the Nigerian banking sector but at a very slow rate towards the long run. It is recommended that banks should extend the coverage of ATM terminals to the rural areas to enhance the level of financial inclusion and by extension boost the earnings of their shareholders in Nigeria. Adequate backup infrastructure should be provided to complement the inadequate public infrastructure since internet connectivity is a sine qua non for improved e-banking services.

INTRODUCTION

Banks are the cornerstone of an economy. They continue to be the driving force behind social and monetary improvement. The importance of banking services for the growth and development of any economic system cannot be overemphasized. The desire to improve or, if possible, get rid of all the problems of long queues, the numbering of counts, tension, loss of precious working hours, within the transport of the services of financial institutions, prompted the search for electronic banking, which is a fabrication of a cashless policy that in its use and application can help to reduce the price of the principal money; this is the money movement charge. In addition, it will help to detect and prevent fraud in the economic device.

In tune with the Central Bank of Nigeria (CBN, 2012), cashless hedging has become essential to the electronic means of transaction in the direction of making Nigeria a cashless economic system in the nearest future. CBN says the policy is a reaction to the growing dominance of cash in the financial system with its concomitant implications for the price of cash management for the banking company, security, and cash laundering between different high prices.

CBN specified that transactions would resume at 3% of the processing cost for withdrawals and 2% of the processing costs to deposit amounts greater than N500,000 for individuals. Additionally, companies will attract 5% based on the processing fee for withdrawals and 3% based on the processing fee for deposits of amounts greater than N3 million (This day, 2019). Many have expressed an appropriate fear that the policy will fail. However, a complete embrace of the electronic payment system is required to achieve the status of a leading economy (Ighoroje and Okoroyibo, 2020).

Although many Nigerians have already embraced digital channels and online transactions in the markets (Matthew and Mike, 2016), regardless of what may be seen due to the early successes of cashless coverage, there are demanding situations that limit its effectiveness. These challenging situations consist of illiteracy, limited use of computers/networks, and lack of self-confidence within the machine, among others, which have a detrimental effect on the bank performance (Kanu, Agu and Acha, 2017).

The widespread and persistent failure of transactions through electronic channels or point of sale terminals (POS) threatens cashless coverage, as well as the monetary inclusion efforts of the banking institution (Vanguard, 2019). Additionally, opponents of the policy achieve this based on the notion that any other subway passages for larger or shorter veil customers are already perceived as being overcharged through numerous fees ranging from the responsibility of the stamp and the costs of bank resupply down to the maintenance of ATM, amongst others (This day, 2019).

In contrast, a comment via (Osazevbaru and Yomere 2015) indicated those banks' profits are often better in cashless contracting compared to a cash-based partnership more frequently, as a result, highlighting the advantages of cashless coverage in the banking sector. Ikpefan, Achugamonu, Isibor and Agwu (2015) found that fraud and unemployment changes in Nigeria may increase due to the cashless economy. Okechi and Kepeghom (2013), Alao and Sorinola (2015) warn that non-monetary policy has a dire effect on the overall performance of commercial banks in Nigeria. Most of the previous studies on performance focused on return on asset (ROA), but the current study will take a digression by looking at earnings per share (EPS), although ROA suggests the potential of control to generate a return for every fair investment that is not unusual. EPS measures return based on participation. An excessive ROA generally means market dominance and pricing power, while a low ROA generally means that an aggregate of aggressive forces and poor execution are pushing the lower line. Companies with constantly growing EPS rates typically enjoy high PE multiples relative to other industries or the common market. However, declining or bad EPS rates generally mean deteriorating fundamentals. This study will fill this gap by examining the nexus between cashless economy policy and the performance of listed deposit money banks in Nigeria.

To this end, the introduction section will closely be followed by a related literature review and the review of relevant theories. Following this closely was the methodology. Immediately after the methodology, came data analyses and interpretation and then the concluding thoughts and policy implications of findings.

LITERATURE REVIEW

This study is predicated upon the (Hicks and Niehans, 1983) transaction cost innovation theory. The theory argues that the need for organizations to reduce transaction cost while at the same time increasing the economic value or earnings necessitated the development and adoption of financial technology. To put it more succinct, cost reduction for services and increased earnings for service delivery are the crux of financial innovation. By this, it could be deduced that the innovation of the financial sector was triggered by the need to enhance the net present value of the shareholder's expected returns. It follows therefore that financial innovation is the product of technological advancement brought about by the desire to enhance the earnings potentials of the shareholders of financial sectors. According to the theory, such a decrease in the transaction cost brings about serious improvement in financial service quality which translates to increased financial patronage and enhanced earnings.

This theory, though built from a microscopic economic structural change, suits this study as enhancements in financial innovation will, in sympathy, cause a decrease in the operating costs, improved income, other performance indicators and an increase in both quantity and quality of service delivery. In a nutshell, this theory postulates that financial innovation has a direct influence on the earning capacity of the financial services industry. To appraise the cashless economy policy on the development of the Nigerian economy, (Okoye and Ezejiofor, 2013) used the analysis of variance to examine whether the cashless economic policy had any significant benefits on the stability of the Nigeria economy. Though cashless economic policy enhances stability, the Central Bank of Nigeria must enshrine in its policy framework adequate plans to properly implement its cashless policy.

Also, Muotolu and Nwadialor (2019) completed a 6-12 year investigation on how the overall financial performance of deposit money banks was hampered by CBN's cashless coverage in Nigeria. The study applied the panel data techniques. Financial performance was measured using the return on asset of selected banks. There was evidence that led to the conclusion that only ATM was statistically significant for measuring financial performance in Nigeria.

The study of Okoro (2014) on electronic payment channels on intermediation efficiency employed the ordinary least square multiple regression using the ATM, POS and MPS as the measures for electronic payment channels. The time spanned the period 2006 to 2011. All the variables except point of sale (POS) were statistically relevant for enhanced and efficient intermediation.

Odior and Fadiya (2012) also conducted a research titled cashless banking challenges, benefits and policy realities in Nigeria. The study focused on the analyses of whether there is an enhancement or deteriorating effects of the cashless policy in Nigeria with the intent to reveal the benefits or otherwise difficulties posed on the economy. Using descriptive analysis, they concluded that the emergence of electronic money had a decreasing effect on the domestic currency. Also, cashless banking enhanced competition among banks in Nigeria.

Furthermore, Siyanbola (2013) in his study assessed the merit and demerits of cashless banking, the means of cashless policy application and the problem of cashless policy. Questionnaires were administered to the sampled respondents to obtain data. Chi-square analytical technique was utilized to analyze the data. Findings revealed that the mode and quality of payments utilized in the banking sub-sector enhance the economic performance in Nigeria.

Also, Shirley and Sushanta (2006) examined whether information technology drives the banking industry's profit. The study applied the panel data technique using 68 banks in the United States for over 20 years. It was discovered that IT enhanced bank profitability in the United States (Figure 1)

The above theoretical framework explains the relationship between cashless economy policy and the performance of listed deposit money banks. Thus, research hypotheses were stated as follows

H_1 Automated Teller Machine has no significant effect on the performance of Nigerian banks

H_2 Point of Sales has no significant effect on the performance of Nigerian banks

H_3 Web Base Transactions has no significant effect on the performance of Nigerian banks

RESEARCH METHODOLOGY

The ex-post facto design was employed in collecting, analyzing and interpreting data for this study. The design was most suited because of the historical nature of the quarterly time-series data employed in this study. The data spanned the period 2010 to 2018 and were evaluated using descriptive statistics. The technique for estimating the parameters was vector error correction. To qualify for VECM estimation, the data were all of order I (1) and cointegrated. The relationship between the variables was stipulated thus:

EPS = f (ATM, POS, WBT)

This function was then restated using the VECM estimating model thus

$$EPS_t = \sum_{i=1}^{p-1} P_1\, \Delta inEPS_{t-1} + \sum_{i=2}^{p-1} P_2\, \Delta inATM_{t-1} + \sum_{i=3}^{p-1} P_3\, \Delta inPOS_{t-1} + \sum_{i=4}^{p-1} P_4\, \Delta inWBT_{t-1} + Z1 * ECM1_{t-1} + e_{1t}$$

Where:
EPS = Earnings per share
ATM = Automated Teller Machine

POS = Point of Sales
WBT = Web Base Transactions
Δ = Difference estimator
et = White noise
Ut-1= period lagged

DATA PRESENTATION AND DISCUSSION

In this section, data collected while carrying out the study were presented and discussed. The hypothesis formulates for the study was tested to determine the effect of cashless economy policy on the performance of listed deposit money bank.
The result in table 1 shows that on average, banks' shareholders earned a total of N14.57 on every naira invested with a standard deviation of N1.90, which indicates low variation across the listed deposit money banks in Nigeria. The minimum and maximum earned as per every naira invested are N10.7 and N17.09 respectively. The minimum and maximum of LATM are 14.30 and 18.53 respectively. The average value of LATM is 16.95, with the standard deviation of 1.45, which indicates low dispersion across the sampled banks. In addition, the mean value of LPOS is 12.75, the standard deviation of 1.66 shows that there is low variation across the sampled banks in respect of POS usage. The minimum and maximum values are 15.72 and 8.54 respectively. Finally, the average of web-based transaction is 12.79; the standard deviation of 0.98 indicates low dispersion and proximity in respect of web-based transaction across the sampled banks. The minimum and maximum values are 14.38 and 10.8 respectively.
On the other hand, the values of the skewness is obtained in Table 4.1 therefore; it means the data is expected to be normally distributed even though it is shown as negatively skewed. The kurtosis value as seen in Table 4.1 also means the peakness of the distribution is expected to be normal. This is in line with so many studies which shows how the distribution of the data should be expected through the use of skewness and kurtosis as testing the data could reveal whether the said data is skewed or the kurtosis is abnormal (Bai and Ng, 2005; Barato and Seifert, 2015; Blanca, Arnau, López-Montiel, Bono, and Bendayan, 2013; Kollo, 2008; Maruyama, 2007; Ryu, 2011).
Table 2 was converted to the augmented Dickey-Fuller unit root to determine stationarity. Since the stationary, all series of order I (1) have been included. This implied that, in stages, the entire collection had unit roots, but then they all became stationary. This meets the need to assess whether the variables were collectively moved to a long run reported by the application of the Johansen cointegration control given in the table below.

In Table 3, both the trace test and the verification of the maximum eigenvalue confirmed the presence of 3 cointegration equations. It is widely anticipated that every trace test and eigenvalue test should have at least one cointegration equation. Taking into account that the entire collection had been incorporated of order I (1) and there was at least one cointegration equation in each suggestion and in most of the eigenvalue evaluations, it changed to indicate that the VECM estimation technique became at the maximum desirable for this study. However, the study decided the optimal standard delay period that would take place within the VECM estimate as indicated in Table Four below.
Table 4 showed that the optimum lag size was lag 3 using the AIC. The AIC was adopted over all other criteria because it has been widely adopted by researchers for lag size selection. This lag size was therefore used for estimating the VECM model as presented in table 5 below.
Table 5 presents the VECM output showing the parameters of the respective variables, the standard error and t-statistics. However, the p-values of the parameters were not displayed, hence the need to estimate a system equation using the EPS equation. The result of the system equation is presented in table 5 below.
Table 6 is the system equation showing the coefficient of each variable, its standard deviation, t-statistic and their respective p-values. It could be seen from the result that there was a negative effect of ATM and earnings per share in the first three lags, however, the 4^{th} lag period of ATM had a positive effect on earnings per share in Nigeria. There was a positive effect of point of sales in the first, third and fourth lagged periods on earnings per share, however, the second lagged period had a negative effect of point of sales on earning per share in Nigeria. Web-based transactions had a positive effect in the first and fourth lagged periods, Web-based transactions had a high-quality impact in the first and fourth lag period, however within the second and 1/3 of the lag period it turned bad. The coefficient of C (1) was the ECM that measured the speed of adjustment of the fast execution imbalance in the long-term equilibrium. The expectation became that the coefficient of C (1) must be poor and huge. Since the coefficient of C (1) changed to neither terrible nor considerable, it was concluded that there was no adjustment from the short-term disequilibrium to the long-term equilibrium. The R2 price of zero.5657 implied that about fifty-six percent of the revenue changes in line with the percentage had been jointly forecast through ATM, POS, and WBT. The F-stat cost of 1.3895 with its corresponding P-rate of 26 percent implied that the model is now not statistically significant.

Table 7 will assess the individual significance of the parameters by applying the world statistics.
Table 7 showed that automate teller machines and point of sales were statistically insignificant in influencing earnings per share. However, web-based transactions had a robust effect on earnings per share in Nigeria. This is so as its F-stats probability value was less than 5 percent. To check whether the estimates of the parameters were stable, the study applied the CUSUM test. The result of the CUSUM test showed that all the estimates were stable. This was arrived at because the blue line lied in between the red lines in Figure 2.

CONCLUSIONS AND POLICY IMPLICATIONS

According to the results of the analyses, the use of electronic banking transaction modes had a long-run effect on earnings per share. Short-run disequilibrium in the data set fails to adjust towards long-run equilibrium. This implied that the use of electronic banking transaction modes jointly influences the earnings per share of the Nigerian banking sector but at a very slow rate towards the long run.
In the short run, the parameters of the automated teller machine were negative in the first three lags, but positive at the fourth lagged period. This implied that the initial use of automated teller machines reduced the earnings power of shareholders in Nigeria. However, three years after its continuous usage, earnings per share were enhanced by automated teller machine. The extent of this enhancement remains low and insignificant within the period of this study. To sustain the enhancement effect of ATM on banks' earnings, banks should extend the coverage of ATM terminals to the rural areas as this is relevant to enhance the level of financial inclusion and, by extension, boost the earnings of its shareholders in Nigeria.
The further analyses revealed that the initial usage of point of sales in the first year reduced the earnings per share of banks, in the second and the third years, it had enhancement effects on earnings per share but decreased the earnings per share of banks in the fourth year. The implications of this may be the low usage of point of sales by bank customers relative to the use of ATM. This explained its insignificant effect on the ability of banks to generate earnings from its usage for this study period. The bank should not restrict the use of POS to medium and large size businesses. Small businesses should be encouraged to transact with POS as this is necessary to increase their usage and earnings power to the banking sector in Nigeria.
Web-based transactions had a significant positive effect on earnings per share of banks in Nigeria in the first and second lagged periods but became negative in the third and fourth lagged periods. This implied that initially web-based transactions promoted enhanced earnings of the shareholders of the banking system, however, with insufficient backup infrastructure, its usage reduced; this resulted in a deterioration of the earnings of banks in Nigeria. Adequate backup infrastructure should be provided to complement the inadequate public infrastructure since internet connectivity is a sine qua non for improved e-banking services as this will enable banks to continue to harness the initial gains from utilizing these channels.

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LIST OF TABLES & FIGURES

Table 1
Descriptive statistics

	LEPS	LATM	LPOS	LWBT
Mean	14.57023	16.95423	12.75987	12.79560
Median	14.42533	17.10156	12.59690	12.88383
Maximum	17.09888	18.53758	15.72009	14.38045
Minimum	10.76211	14.30652	8.544419	10.80404
Std. Dev.	1.906006	1.453688	1.668468	0.984791
Skewness	-0.144619	-0.581400	-0.282859	-0.681437
Kurtosis	1.763882	1.919567	3.034703	2.837054
Jarque-Bera	2.417469	3.779162	0.481863	2.825962
Probability	0.298575	0.151135	0.785896	0.243417
Sum	524.5282	610.3524	459.3554	460.6415
Sum Sq. Dev.	127.1500	73.96229	97.43247	33.94344
Observations	36	36	36	36

Table 2
ADF Unit root test

Variables	Level	1st D	Order of Integration
LEPS	-1.275264	-8.157022	I (1)
LATM	-1.513429	-5.549639	I (1)
LPOS	-1.970907	-6.831360	I (1)
LWBT	-1.616068	-6.643414	I (1)

Test critical values at levels: 1% = - 3.639407; 5% = -2.951125; 10% = -2.614300
Test critical values at levels: 1% = - 3.639407; 5% = -2.951125; 10% = -2.614300

Table 3
Johansen cointegration test

Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.773198	104.7762	47.85613	0.0000
At most 1 *	0.691992	58.78226	29.79707	0.0000
At most 2 *	0.510012	22.27571	15.49471	0.0041
At most 3	0.005183	0.161076	3.841466	0.6882

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.773198	45.99396	27.58434	0.0001
At most 1 *	0.691992	36.50655	21.13162	0.0002
At most 2 *	0.510012	22.11463	14.26460	0.0024
At most 3	0.005183	0.161076	3.841466	0.6882

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level

Table 4
Value lag order selection criteria

Endogenous variables: LEPS LATM LPOS LWBT

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-146.3887	NA	0.106782	9.114466	9.295861	9.175500
1	-48.89854	165.4378*	0.000772*	4.175669	5.082643*	4.480838*
2	-33.53056	22.35342	0.000841	4.213974	5.846527	4.763278
3	-15.54554	21.80003	0.000844	4.093669*	6.451802	4.887109

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 5
Vector Error Correction Model

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	
LEPS(-1)	1.000000	0.000000	0.000000	
LATM(-1)	0.000000	1.000000	0.000000	
LPOS(-1)	0.000000	0.000000	1.000000	
LWBT(-1)	-2.689150 (0.42094) [-6.38837]	-1.768850 (0.27584) [-6.41250]	-1.992419 (0.22719) [-8.76987]	
C	19.97635	5.731419	12.77959	
Error Correction:	D(LEPS)	D(LATM)	D(LPOS)	D(LWBT)

CointEq1	0.070819 (0.15678) [0.45172]	0.515059 (0.10877) [4.73549]	0.662436 (0.18495) [3.58164]	0.089990 (0.15827) [0.56860]
CointEq2	-0.039987 (0.19880) [-0.20114]	-0.891552 (0.13792) [-6.46412]	-0.439215 (0.23454) [-1.87270]	-0.214890 (0.20069) [-1.07074]
CointEq3	-0.079196 (0.17541) [-0.45148]	-0.019463 (0.12170) [-0.15993]	-0.401607 (0.20694) [-1.94069]	0.432636 (0.17708) [2.44317]
D(LEPS(-1))	-0.384065 (0.25002) [-1.53617]	-0.249603 (0.17345) [-1.43903]	-0.839647 (0.29495) [-2.84673]	0.234422 (0.25239) [0.92881]
D(LEPS(-2))	0.003848 (0.28070) [0.01371]	0.047915 (0.19474) [0.24604]	-0.515663 (0.33115) [-1.55718]	0.388312 (0.28337) [1.37035]
D(LEPS(-3))	-0.251681 (0.23588) [-1.06701]	-0.335830 (0.16364) [-2.05222]	-0.375346 (0.27827) [-1.34885]	-0.009077 (0.23812) [-0.03812]
D(LATM(-1))	-0.173294 (0.20711) [-0.83671]	0.414012 (0.14369) [2.88131]	0.542446 (0.24434) [2.22005]	0.130953 (0.20908) [0.62632]
D(LATM(-2))	-0.068730 (0.24872) [-0.27633]	0.744951 (0.17255) [4.31719]	0.150644 (0.29343) [0.51340]	-0.034307 (0.25109) [-0.13663]
D(LATM(-3))	0.439618 (0.25364) [1.73324]	0.859027 (0.17597) [4.88176]	0.116430 (0.29923) [0.38910]	0.121001 (0.25605) [0.47257]
D(LPOS(-1))	0.092353 (0.20822) [0.44354]	-0.066681 (0.14446) [-0.46160]	-0.419006 (0.24564) [-1.70575]	-0.609982 (0.21020) [-2.90194]
D(LPOS(-2))	-0.070828 (0.20577) [-0.34420]	-0.216118 (0.14276) [-1.51387]	-0.416138 (0.24276) [-1.71421]	-0.267428 (0.20773) [-1.28739]
D(LPOS(-3))	0.005068 (0.19235) [0.02635]	-0.353456 (0.13345) [-2.64862]	-0.144930 (0.22693) [-0.63866]	-0.298196 (0.19418) [-1.53565]
D(LWBT(-1))	0.095800 (0.23437) [0.40876]	-0.248253 (0.16260) [-1.52680]	0.162597 (0.27649) [0.58807]	0.122497 (0.23660) [0.51775]
D(LWBT(-2))	-0.050037 (0.22699) [-0.22044]	-0.604991 (0.15747) [-3.84183]	0.564000 (0.26778) [2.10619]	-0.069468 (0.22914) [-0.30317]
D(LWBT(-3))	-0.621340 (0.23108) [-2.68887]	-0.517620 (0.16031) [-3.22878]	0.301865 (0.27261) [1.10731]	-0.080917 (0.23327) [-0.34688]

C	0.296830 (0.12246) [2.42394]	0.238457 (0.08496) [2.80679]	0.432366 (0.14447) [2.99282]	0.195934 (0.12362) [1.58496]
R-squared	0.565721	0.821008	0.655524	0.691928
Adj. R-squared	0.158584	0.653203	0.332577	0.403110
Sum sq. Resids	1.753488	0.843975	2.440460	1.786975
S.E. equation	0.331048	0.229670	0.390549	0.334194
F-statistic	1.389511	4.892635	2.029821	2.395722
Log likelihood	1.060028	12.75985	-4.229242	0.757353
Akaike AIC	0.933748	0.202509	1.264328	0.952665
Schwarz SC	1.666616	0.935377	1.997196	1.685533
Mean dependent	0.157516	0.126312	0.160317	0.109703
S.D. dependent	0.360899	0.390002	0.478052	0.432566

Determinant resid covariance (dof adj.)	7.23E-05
Determinant resid covariance	4.52E-06
Log likelihood	15.28584
Akaike information criterion	3.794635
Schwarz criterion	7.275758
Number of coefficients	76

Table 6
Vector Error Correction Model System Equation

Dependent Variable: D(LEPS)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 07/21/20 Time: 22:30
Sample (adjusted): 2011Q1 2018Q4
Included observations: 32 after adjustments
D(LEPS) = C(1)*(LEPS(-1) - 2.68915005847*LWBT(-1) + 19.9763483174)
+ C(2)*(LATM(-1) - 1.7688498209*LWBT(-1) + 5.73141853399) + C(3)
*(LPOS(-1) - 1.99241888695*LWBT(-1) + 12.7795872018) + C(4)
*D(LEPS(-1)) + C(5)*D(LEPS(-2)) + C(6)*D(LEPS(-3)) + C(7)*D(LATM(
-1)) + C(8)*D(LATM(-2)) + C(9)*D(LATM(-3)) + C(10)*D(LPOS(-1)) +
C(11)*D(LPOS(-2)) + C(12)*D(LPOS(-3)) + C(13)*D(LWBT(-1)) + C(14)
*D(LWBT(-2)) + C(15)*D(LWBT(-3)) + C(16)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.070819	0.156775	0.451724	0.6575
C(2)	-0.039987	0.198803	-0.201139	0.8431
C(3)	-0.079196	0.175413	-0.451484	0.6577
C(4)	-0.384065	0.250015	-1.536168	0.1440
C(5)	0.003848	0.280700	0.013708	0.9892
C(6)	-0.251681	0.235875	-1.067011	0.3018
C(7)	-0.173294	0.207114	-0.836707	0.4151
C(8)	-0.068730	0.248722	-0.276334	0.7858
C(9)	0.439618	0.253640	1.733240	0.1023
C(10)	0.092353	0.208219	0.443539	0.6633
C(11)	-0.070828	0.205773	-0.344204	0.7352
C(12)	0.005068	0.192354	0.026347	0.9793
C(13)	0.095800	0.234368	0.408757	0.6881
C(14)	-0.050037	0.226985	-0.220443	0.8283
C(15)	-0.621340	0.231078	-2.688869	0.0161
C(16)	0.296830	0.122458	2.423937	0.0276

R-squared	0.565721	Mean dependent var	0.157516

Adjusted R-squared	0.158584	S.D. dependent var	0.360899
S.E. of regression	0.331048	Akaike info criterion	0.933748
Sum squared resid	1.753488	Schwarz criterion	1.666616
Log likelihood	1.060028	Hannan-Quinn criter.	1.176673
F-statistic	1.389511	Durbin-Watson stat	2.062708
Prob(F-statistic)	0.260412		

Table 7
Wald test of significance of individual parameters

Variables	Hypotheses	F-stats value	P-value	Decision
LATM	C (7) = C (8) =C (9) = 0	1.430102	0.2709	Accept H_0
LPOS	C (10) = C (11) =C (12) = 0	0.261407	0.8521	Accept H_0
LWBT	C (13) = C (14) =C (15) = 0	3.700820	0.0339	Reject H_0

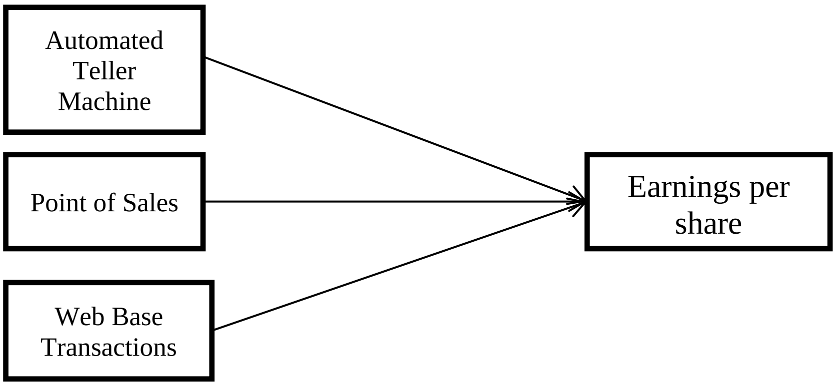

Figure 1
A representation of the variables
Source: developed by the author

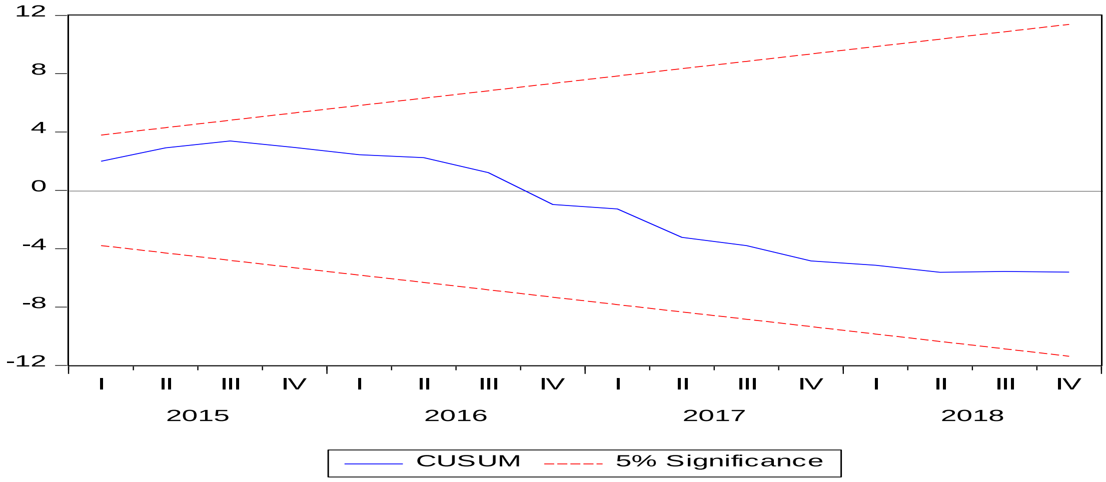

Figure 2
CUSUM Stability test