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Abstract

In the wake of dissenting views on the import of the implementation of the Treasury Single Account (TSA) in Nigeria, the researchers consider it wise to empirically examine the impact of TSA on funds availability for lending to the economy. The research is meant to evaluate and predict what Nigeria should expect in the era of TSA using existing data. Annual financial data of secondary origin, obtained from Central Bank of Nigeria Statistical Bulletin spanning 1975 and 2015 are used in the study. Financial intermediation is represented by Total Credit to the economy (as explained variable) while Total Credit to Private Sector (TCPS), Total Federal Government Revenue (TFREV), Deposit Interest Rate (DPRT), Prime Lending Rate (PLR), Cash Reserve Requirement (CRR) and Liquidity ratio (LIQR) are explanatory variables. TFREV is a direct representation of TSA in the model. The data are analysed using Ordinary Least Square technique of multiple regression. The results clearly show that TFREV assumes a positive and statistically non-significant relationship with TCR. TCPS and DPRT also exhibit a positive relationship with TCR. PLR, CRR and LIQR exhibit negative relationship with TCR, all in line with the expectations of the study. Consequently, the researchers recommend that since government revenues support banks’ lending and increase their liquidity, movement of these funds from commercial banks will exert negative impact on bank liquidity and their ability to grant loans and subsequently heightens the lending rate; therefore, a distributed or liberal form of TSA model should be adopted for the safety of our banking industry.

JEL classification: E51, G21, G28

Keywords: treasury single account, financial intermediation, total federal government revenue

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INTRODUCTION

The ability of commercial banks (DMBs) to create money or credit depends to a large extent on the amount of funds at their disposal. The amount of funds at their disposal is a function of how much has been mobilised, mopped up, received or collected from the depositors (surplus units). This process is called indirect finance and because it requires some form of intermediaries to smoothen the process, it is therefore called financial intermediation. Financial intermediation has to do with the movement or transfer of funds from surplus economic units which may comprise individuals, firms, and government agencies to the deficit economic units which may also comprise individuals, firms, and government agencies of the economy for investment and production which would enhance the productive capacity and overall output and employment. Financial intermediation is a major role of the “financial system”, which, according to Ekezie (2006) involves the coming together of financial institutions and agents and the specification of rules and regulations that will enable approved regulators to regulate interactions between and among the institutions and the rest of the world in order to foster economic growth and development of a nation. Financial intermediation has two sides – the supply side and the demand side. The supply side which is known as the surplus economic units are the creditors who provide the needed funds and the demand side also known as the deficit economic units are the borrowers who require the funds for productive and investment purposes.

The amount of funds that can be mobilised from the surplus economic units depends on some economic factors that are of interest to both the depositor and the financial intermediaries/institutions (FIs) and also the amount of funds that can be given out by the FIs to the deficit economic units is a function of the monetary policies of the country involved. The suppliers of funds get returns on the funds in the form of interest (deposit) rate and the users of funds pay some cost (interest) to obtain it from the financial intermediaries. Olowe (1998) affirms that interest is the payment made for the use of money. The difference between what the intermediaries collect from the users of funds and what they (the intermediaries) pay to the suppliers of funds is called the spread. The requirements of the creditors and that of the borrowers from the FIs are always at variance. The creditors require high rate of return and short term investment whereas the borrowers require low cost of funds to enable them run a profitable business, and for the long term. These opposing anticipations require the FIs to be deft in handling their requests and harmonising their interests while ensuring a reasonable return.

Banks bridge the gap between the needs of lenders and borrowers by performing a transformation function. These functions include: size transformation; maturity transformation; and risk transformation (Casu, Girardone & Molyneux, 2006). According to Kashyap et al., (2002) as cited in CBN (2013), deposit-taking and lending by banks are closely related and both activities share similar transaction costs and are meant to reflect the liquidity transformation function of banks. In Nigeria, financial intermediation is the responsibility of licensed financial institutions and financial markets with regulators appointed to oversee the operations and enforce compliance with the enabling laws. The financial institutions include banks and non-bank financial institutions. While banks provide funds for short term use, financial markets provide both short term (money market) and long term funds.

This study was motivated by the policy of the Federal Government of Nigeria directing all Ministries, Departments and Agencies (MDAs) to close all their revenue accounts with deposit money banks and rather be lodging all their revenues in a single account domiciled with the Central Bank of Nigeria (CBN). This idea of accounting is known as Treasury Single Account (TSA). According to the CBN (2016), the Treasury Single Account (TSA) initiative is the operation of a unified structure of Government Bank Accounts, in a single account or a set of linked accounts for all government payments and receipts. The TSA is primarily designed to bring all government funds in bank accounts within the effective control and operational purview of the Treasury, in order to: enthrone centralised, transparent and accountable revenue management; facilitate effective cash management; ensure cash availability; promote efficient management of domestic borrowing at minimal cost; allow optimal investment of idle cash; block loopholes in revenue management; establish an efficient disbursement and collection mechanism for government funds; improve liquidity reserve; and eliminate operational inefficiency and costs associated with maintaining multiple accounts across multiple financial institutions.

This laudable policy is fraught with some unintended downsides. Key to this paper is the aspect of financial intermediation that is being influenced by this policy. Moving MDAs’ deposits from DMBs to CBN tends to bring about the following intermediation issues;

1) Reduction in liquidity in the banking system,

2) Pressure on the interest rate,
3) Limited credit to the economy,
4) Negative impact on the economy;
5) Surge in money market rates;
6) Loss of jobs in banks;
7) Re-recapitalisation of banks;
8) High Federal Government’s (FG) debt profile; and
9) High cost of government debt due to poor cash management, among others.

In line with the seeming challenges of TSA highlighted above, the researchers intend to appraise the impact of Federal Government revenue on financial intermediation in Nigeria in order to project how banks’ intermediation will suffer or succeed in the absence of Federal government funds. The appraisal will cover the period between 1975 and 2015.

This study is organised in five sections. Section one which is the introduction encompasses the background to the study. Section two deals with the review of related literature which includes conceptual, theoretical and empirical literature. In section three, the researchers discuss the methodology applied in the study. In section four, results of data analysed are presented and discussed while section five shows the conclusion where recommendations are also made.

BACKGROUND TO THE TREASURY SINGLE ACCOUNT IN NIGERIA

The Federal Government of Nigeria (FGN) commenced the first phase of the implementation of the TSA in January 2012 as part of the Economic Reforms and Governance Project (ERGP), the impact of which was not felt by banks as the mandatory remittance of inflows to CBN was not enforced. Originally, the TSA was intended to ensure the optimum use of cash resources and to reduce government borrowing. The first phase started with the payment element which enabled selected Ministries, Departments and Agencies (MDAs) to draw payments from single account or designated accounts with the CBN. The full implementation of the TSA, which brought in the e-collection segment of the scheme took place in September 2015 (CBN, 2016).

Under the scheme, all FGN Public sector funds were remitted to CBN, with the exception of the National Assembly and Judiciary that belong to different arms of Government. The TSA forms part of the government’s public financial management reform programme, through which harmonization of over 5,000 multiple Federal Government (FG) accounts across CBN Branches and DMBs were harmonized into a single account with the bank, known as the Consolidated Revenue Fund (CRF) and connected accounts (CBN, 2016). To the best of my knowledge as an ex-banker, these 5,000 accounts were attached to about 5,000 employees of the various banks involved, as the accounts were harmonised, certainly their major source of deposits vanished, and their jobs put on the line.

The Bank (CBN) collaborated with the Office of the Accountant General of the Federation (OAGF) to ensure that all outstanding MDAs were migrated to TSA, which became fully operational by September 15, 2015 and to continue in the 2016/2017 period.

TSA was expected to bring about the following benefits:
1) Effective implementation of monetary policies, as government funds are consolidated with the CBN, which eliminates DMBs float, Monetary, Credit, Foreign Trade and Exchange Guidelines for Fiscal Years 2016/2017 and consequently reduces costs of liquidity management,
2) Promote transparency and accountability and block leakages in the management of public finance,
3) Elimination/reduction of FG access to Ways and Means Advances which involves printing of high powered money with its attendant inflationary impacts,
4) Facilitation of an efficient payments mechanism, which in turn supports the development and modernization of the payments system,
5) Minimization of volume and cost of borrowing, as all idle funds are consolidated by the government. For instance, the FG borrows from the capital market and incurs costs, despite huge idle credit balances on MDA capital accounts,
6) Make revenue available to FG to utilize for economic development and growth,
7) Ensuring availability of cash to meet obligations,
8) Provide real time information on government cash resources on a consolidated basis and assist in reliable cash flow forecast,
9) Improvement in operational controls during budget execution, as information about cash resources
is readily available,

10) Minimization of float in the system by ensuring that idle funds were utilized,

11) Reduction on banks' fees and charges (CBN, 2016).

**Models of treasury single account**

As part of the essential requirements of TSA, there are two TSA models:

A situation where the main account and associated ledger sub-accounts (where they exist) are to be maintained in a single banking institution OR,

A situation where the main TSA is maintained in a single banking institution and associated zero balance ledger sub-accounts (ZBAs) (where they exist) are maintained in other institutions from where balances are swept daily to the main TSA in CBN or the appointed main TSA hosting financial institution (CBN, 2016).

In other words, although there are several variants of the TSA structure, they can be broadly grouped into two categories: centralized and distributed TSA architectures. The TSA systems established in most countries fall somewhere in between these two models and involve various types of bank accounts.

A purely centralized arrangement is one in which all revenue and expenditure transactions of the government pass through a single account generally maintained with the central bank,

At the other extreme, a TSA could be virtually operational even though line agencies - down to the lowest level in the organizational hierarchy - are allowed to retain separate transaction accounts in the banking system. However, in the latter case, balances in all transaction accounts should be swept into the TSA main account periodically (Pattanayak & Fainboim, 2010).

**Treasurty single account coverage**

Delineating the boundary of a TSA is an important issue and needs to be carefully considered in light of each country’s institutional and legal/regulatory framework. In defined circumstances, there could be a case for maintaining some bank accounts that cannot be fully integrated into the TSA. For example, there are situations where geographical factors or the non-availability of banking facilities preclude the use of a TSA. At a minimum, the TSA should cover all central government entities and their transactions. These include accounts managed by social security funds and other trust funds, extra-budgetary funds (EBFs), and autonomous government entities, and loans from the multilateral institutions and donor aid resources. A TSA could also be extended, in theory at least, to include sub-national levels of government and other public institutions through the use of correspondent accounts (Pattanayak, 2010).

**Review of related literature**

In this section of the study, the researchers considered and reviewed literature in the area of Treasury Single Account (TSA) and financial intermediation in the Nigerian economy. In making credit available, banks are rendering a great social service, because through their action production is increased, capital investments are expanded and a higher standard of living is realized (Adekanye, 1986).

It was reported by Odunsi (2017) that the Accountant General of the Federation, Mr. Ahmed Idris, said that the Federal Government has recorded over N7 trillion in the Treasury Single Account (TSA) within six months of its operation. For the researchers, this statement implies that the above sum has been reduced from the funds available for lending to private sector and other borrowers for economic growth. That is why the benefits so highlighted are to the government (the public sector) and not to the private or core private sector. These gains that accrue to government become the pains that the private sector is passing through. This policy appears to be government centred and hence, tends to limit financial intermediation. According to CBN (2015) while analysing financial/banking system developments in its 2015 annual report, “the banking system’s capacity to finance the economy rose slightly, with the aggregate credit to GDP ratio at 22.7 per cent from the 21.4 per cent in 2014. However, the ratio of private sector credit to GDP fell slightly to 19.7 per cent from 20.1 per cent in 2014, signifying substantial growth of net claims on government, which crowded out credit to the private sector.” This is not sufficient to conclude just after three months into the TSA era but provides a useful insight to support the anxiety nursed by the researchers as the bane of this era if conscious effort(s) are not made to checkmate it.

Meanwhile, some analysts feared that the TSA policy could lead to another round of bank failure as the policy is capable of posing serious cash crunch and li-
liquidity challenges to the banking sector (Imandojemu, 2016). According to Okwe et al., (2015) the implementation of TSA affected the liquidity level in the banking system, creating a surge in money market rates as banks scrambled for funds to stabilise their liquidity positions. Besides, the Nigerian banking industry on an aggregate basis would be affected in terms of deposits and funding cost structure.

Adegbite (2015) posited that the TSA is a master-stroke policy which is more than simply closing down accounts. It is the most potent ant corruption weapon by any government, given that it is a two-edged sword that would checkmate corruption in government and also a brilliant policy that will help sanitise the banking sector. Soludo (2015) stated that TSA is a great initiative; but that the past should not be followed by allowing government funds to be redundant in the Central Bank and that for an economy like Nigeria, that is desperately in need of stimulation, piling up idle cash balance at the CBN does not constitute sound economics.

Eme, Chukwurah and Iheanacho (2015) posit that the order on TSA, which came into effect on August 11, 2015marks the beginning of unified accounting by MDAs for both government revenues and expenditures and that the situation that existed before now was clearly against the requirements of the Nigerian Constitution as contained in Sections 80 and 162, hence, a flagrant breach of the constitution. They expressed satisfaction that the disrespect for the Constitution would now be history. As Yusuf (2015) puts it, “Bank treasurers complained that the implementation would adversely affect liquidity in the banking system and end up putting pressure on interest rates and availability of credit to the economy”.

Financial intermediation in Nigeria

In the majority of instances, financial intermediation is meant to engender economic growth and development in any economy. That is why an efficient and robust financial system is a precondition, else, we talk about direct finance – where there are no intermediaries and the parties depend on luck and chance to recover their funds/mannies. It is against this backdrop that financial intermediation was introduced to take care of the risks inherent in direct finance, though, at a cost. The vehicles of financial intermediation are financial intermediaries (FIs) and financial markets. It is through the mechanism of (FIs) and financial markets that funds are transferred and allocated to the most productive opportunities of the economy.

Sheriff and Amoako (2014) posit that the supply of loanable funds is largely determined by the total volume of deposits mobilized by the banking sector and that increase in the supply of funds should reduce lending rates. According to Yakubu (2014), available literature reveals that there is a general agreement that banks intermediation brings about economic growth and that the role extends to other sectors of the economy including agriculture, manufacturing and other productive sectors.

Theoretical and empirical literature

In this sub-section of the paper, theories of financial intermediation and work done by other researchers on financial intermediation, TSA and other related topics will be reviewed.

CBN (2013) posited that a number of theories explain the role of financial intermediation. These theories include the theories of asymmetric (imperfect) information and agency, all of which lead to market imperfections and thus transaction costs. The rationale for the existence of intermediaries such as banks is that they can reduce information and transaction costs that arise from information asymmetry between lenders and borrowers. The modern theory of financial intermediation is hinged on two arguments namely; intermediaries’ (such as banks) ability to provide liquidity and their ability to transform the risk characteristics of assets. Thus, banks for example are able to act as coalitions of depositors that provide households with insurance against idiosyncratic shocks that adversely affect their liquidity positions (Diamond & Dybvig, 1983). The agency argument for the role of intermediaries’ activities is in the creation of value arising from the qualitative asset transformation; in a situation where the supply and demand for credit for example, cannot be fully met in the market.”

The existence of financial intermediation can be explained by five theories. The theories relate to: delegated monitoring; information production; liquidity transformation; consumption smoothening; and the role of banks as a commitment mechanism (Casu, 2006). In this paper, the theories of asymmetric information, delegated monitoring, liquidity transformation, agency and commitment mechanism are relevant.

Mauraina (2018) investigated the effect of TSA on Deposit Money Banks’ (DMBs) liquidity performance in Nigeria. Correlational research design was adopted in the analysis of data collected from the CBN Statistical
Bulletins between 2012 and 2017 in order to test pre and post implementation periods of the TSA. They used DMB liquidity ratio as the dependent variable while Federal Government’ s Deposits (FGD) at the DMBs was used as independent variable. Findings from the study showed that FGD had a positive and significant effect on DMBs’ liquidity position in the Pre-TSA era but a negative and significant effect on DMBs’ liquidity performance in the Post-TSA era. They recommended a hybrid TSA model in order to boost the DMBs’ liquidity position in the country.

Ivungu et al., (2020) in their examination of the effect of TSA on corruption in the Nigerian public sector so as to assess how TSA impacted the Corruption Perception Index (CPI) in Nigeria, used data obtained from Transparency International for the period 2012 to 2014 (pre –TSA adoption) and 2016 to 2016 (post-TSA adoption) with data of 2015 as the base year in their analysis. Findings from the study revealed that there is no significant difference in the mean of corruption perception index (CPI) before and after TSA adoption in Nigeria. Their conclusion is that TSA has not significantly reduced corruption in the Nigerian public sector.

The assessment of the implementation effect of TSA on the economy of Nigeria: The perspective of Banking Sector by Ilori et al., (2019) using a descriptive approach, revealing that TSA has led to a drastic reduction in corrupt practices and monetary misappropriation. Echekoba et al., (2020) assessed the effect of TSA in Nigerian Banks’ performance using an ex post facto research design. They regressed federal government deposit on credit to the private sector and found that federal government deposit has significant influence on credit to the private sector.

Imandojemu (2016) examined the nexus between the full implementation of the Treasury Single Account (TSA) system and economic emancipation in Nigeria. They used data sourced from the CBN Statistical Bulletin employing an explorative analysis method. Findings indicated that the full implementation of TSA is capable of rejuvenating the drive for economic emancipation in Nigeria. The researcher recommended policy reforms to serve as an operational framework for the full implementation of TSA, being one of the pre-conditions of optimal resource utilization and economic autarky.

Bakare, Isaac and Samuel (2015) examined the extent to which banks’ credit affects economic growth in Nigeria. They used secondary data obtained from the Central Bank of Nigeria statistical bulletin for a period of 24 years from 1990 to 2013. Variables used in the study were Gross Domestic Product as proxy for economic growth while inflation rate, credit to the private sector and credit to the public sector were independent variables. All variables used were stationary at first difference. The result showed that the lagged value of credit to the public sector relates positively thought in a non-significant manner with GDP and the lagged value of credit to the private sector is positively and significantly influencing economic growth in Nigeria. Meanwhile, lagged value of inflation shows a negative and significant relationship with economic growth. The recommendation was that to stem the rate of misappropriation of government funds by public officers, government should ensure that auditing of their financial statement is done as and when due.

Yakubu (2014) in their assessment of the impact of commercial banks credit on economic growth in Nigeria using data covering the period ranging from 1992 to 2012, used commercial bank credit to the private sector of the economy to estimate its impact on Nigeria’s economic growth. Ordinary Least Square regression technique was adopted in analysing the data. The result showed that commercial bank credit has significant effect on economic growth in Nigeria. In line with the results obtained, it was recommended that banks should enhance and sustain their credit culture while effort should be intensified to have a comprehensive legal framework that will continue to assist in monitoring the performance of credit to the private sector and guarantee recovery of delinquent loans. Sharing of information on bad debts would prevent other banks from being a victim to the same debtor customer.

Ekpenyong and Acha (2011) investigated the role of banks in economic growth. Bank deposits and bank credit to the private sector were used as independent variables to represent financial intermediation and real gross domestic product (RGDP) represented economic growth. Regression results revealed bank intermediation function contributes to economic growth in Nigeria. It was recommended that banks should expand credit to the private sector.

Anthony (2012) investigated the determinants of bank savings in Nigeria and its impact on Nigeria’s economic growth from 1970 - 2006. Distributed Lag-Error Correction Model (DL-ECM) and Distributed Model were adopted. Results revealed that Interest Rate Spread (IRS), GDP per capita (PCY), Financial Deepening (FSD) exhibit a positive relationship with private domestic savings and that private domestic deposit negatively relate with Real Interest Rate (RIR) and Inflation Rate (INFR). The researcher recommended that government should intensify efforts to reduce unemployment and consequently improve per capita income in the economy.
Bassett et al., (2013) posited that identifying macroeconomic effects of credit shocks is difficult because many of the same factors that influence the supply of loans also affect the demand for credit. Using bank-level responses to the Federal Reserve’s Loan Officer Opinion Survey, they constructed a new credit supply indicator: changes in lending standards, adjusted for the macroeconomic and bank-specific factors that also affect loan demand. Tightening shocks to this credit supply indicator led to a substantial decline in output and the capacity of businesses and households to borrow from banks, as well as widening of credit spreads and an easing of monetary policy.

Ogiriki and Andabai (2014) examined the relationship between financial intermediation and economic growth. Using secondary data obtained from the National Bureau of Statistics and CBN Statistical Bulletin for the period spanning 1988 and 2013. Vector Error Correction Model technique was employed. Unit root test was conducted and the result implied the absence of unit roots among the variables. The existence of long-run equilibrium relationship between economic growth and financial intermediation was confirmed and the speed of adjustment required to catch up with long run equilibrium was established. Proper regulation and control of the activities of financial intermediaries as a panacea for a sound financial system was recommended. Also, banks should not be allowed to possess excess liquidity in order not to trigger inflationary tendencies in the economy.

Eriemo (2014) investigated the macroeconomic determinants of bank deposits in Nigeria. Analysis of the effects of macroeconomic indicators on the performance of banks as regard deposit mobilization and its determinants was done. Data spanning the period between 1980 and 2010 were used in the study. The parsimonious Error Correction Mechanism result revealed that the variables selected (bank branches, bank investment, the general price level and interest rate) greatly influenced the level of bank deposits in Nigeria. The Johansen cointegration test and Vector Error Correction Mechanism indicated a long run relationship among the variables and satisfactory speed of adjustment of short run disequilibrium. In an attempt to improve the deposits of banks the influences of the variables chose for the study should be considered.

**Methodology**

This is a predictive research aimed at using government revenue to look into the future of bank lending in the era of TSA in Nigeria. In this segment of the paper, the researchers describe the processes that are used in data collection and model specification among other major highlights.

Secondary data research design which is also known as ex post facto design is used in the study. Annual financial data spanning 1975 and 2015 and obtained from CBN Statistical Bulletin of various years are used. Ordinary Least Square (OLS) technique of multiple regression was used in analysing the data using econometric statistical software called Eviews.

In order to ease analysis of the data obtained for the study and capture all the selected variables, we specified our model taking into consideration the theory of asymmetric information which leads to transaction costs. Financial intermediation is represented by Total credits to the Economy (TCR) while Total Credit to Private Sector (TCPS), Total Federal Government Revenue (TFREV), Deposit Interest Rate (DPRT), Prime Lending Rate (PLR), Cash Reserve Requirement (CRR) and Liquidity Ratio (LIQR) are explanatory variables. DPRT and PLR represent costs of financial intermediation to depositors and borrowers respectively. TFREV is a direct representation of TSA in the model, bearing in mind that TSA represents Federal government revenue for the period of the study, now moved to CBN.

The functional representation of the model is as follows:

$$ TCR = f(TCPS, TFREV, DPRT, PLR, CRR, LIQR) $$

Where

- $TCR = $Total Credits to the Economy
- $TCPS = $Total Credit to Private Sector
- $TFREV = $Total Federal Government Revenue
- $DPRT = $Deposit Interest Rate
- $PLR = $Prime Lending Rate
- $CRR = $Cash Reserve Requirement
- $LIQR = $Liquidity Ratio

The econometric model of the relationship is shown as:

$$ TCR = \beta_0 + \beta_1TCPS + \beta_2TFREV + \beta_3DPRT + \beta_4PLR + \beta_5CRR + \beta_6LIQR + \mu $$
Table 3.1 shows the variables and the expected signs of their coefficients in the study.

Table 3.1: A Priori Expectations of the Study

<table>
<thead>
<tr>
<th>Variables</th>
<th>TCPS</th>
<th>TFREV</th>
<th>DPRT</th>
<th>PLR</th>
<th>CRR</th>
<th>LIQR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A priori sign</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Author’s Expectation.

### Discussion of Results

In this section of the study, results of unit root test, multicollinearity test, CUSUM test of stability, results of cointegration based on trace test and max-eigen value test and summaries of long run and short run tests will be discussed.

Table 4.1: Result of Unit Root Test Based On Phillips-Perron Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>CRITICAL VALUE @</th>
<th>Order of Integration</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>TCR</td>
<td>-5.522929</td>
<td>-4.219126</td>
<td>-3.533083</td>
<td>I(2)</td>
</tr>
<tr>
<td>TCPS</td>
<td>-4.639567</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
<tr>
<td>TFREV</td>
<td>-6.037568</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
<tr>
<td>DPRT</td>
<td>-7.472098</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
<tr>
<td>PLR</td>
<td>-10.394620</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
<tr>
<td>CRR</td>
<td>-7.129392</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
<tr>
<td>LIQR</td>
<td>-11.020120</td>
<td>-4.211868</td>
<td>-3.529758</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Source: Author’s computation using Eviews 9.

In order to ascertain the level of stationarity of time series data used in the study, unit root test whose results are shown in Table 4.1 was conducted using Phillips-Perron (PP) at trend and intercept. The result reveals that all variables are stationary at first difference (that is, I(1)) except TCR that is stationary at second difference (that is, I(2)).

Table 4.2: Multicollinearity Test using Variance Inflation Factor (VIF)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient variance</th>
<th>Variance Inflation Factor (VIF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>713589.900000</td>
<td>NA</td>
</tr>
<tr>
<td>TFREV</td>
<td>0.008176</td>
<td>6.373050</td>
</tr>
<tr>
<td>TCPS</td>
<td>0.003169</td>
<td>5.639455</td>
</tr>
<tr>
<td>DPRT</td>
<td>2739.690000</td>
<td>5.209072</td>
</tr>
<tr>
<td>PLR</td>
<td>1985.559000</td>
<td>4.353881</td>
</tr>
<tr>
<td>CRR</td>
<td>665.421000</td>
<td>1.740749</td>
</tr>
<tr>
<td>LIQR</td>
<td>222.662200</td>
<td>1.395477</td>
</tr>
</tbody>
</table>

Source: Author’s computation using Eviews 9.
Also, in order to ascertain whether the variables are highly correlated or not, a multicollinearity test which results are shown in Table 4.2 was conducted and the coefficients of variance inflation factor (VIF) indicates that the variables are free from multicollinearity.

**Cointegration Test**

Cointegration test was conducted to determine if there is any long run relationship among the variables used in the study. The existence of four cointegrating equations in unrestricted cointegration rank trace test (see Table 4.3 in the appendix) and also three cointegrating equations in unrestricted cointegration rank max-eigenvalue test (see Table 4.4 in the appendix) confirm that there is long run equilibrium among the variables. This implies that even series that may be non-stationary tend to move closely together over-time and their difference then becomes stationary (Adenuga, 2009).

### Table 4.5: Summary of Ordinary Least Square (OLS) Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1219.711000</td>
<td>844.742500</td>
<td>1.443885</td>
<td>0.1579</td>
</tr>
<tr>
<td>TFREV</td>
<td>0.164067</td>
<td>0.090421</td>
<td>1.814478</td>
<td>0.0784</td>
</tr>
<tr>
<td>TCPS</td>
<td>0.590303</td>
<td>0.056295</td>
<td>10.485790</td>
<td>0.0000</td>
</tr>
<tr>
<td>DPRT</td>
<td>4.210018</td>
<td>52.342050</td>
<td>-0.080433</td>
<td>0.9364</td>
</tr>
<tr>
<td>PLR</td>
<td>-13.634840</td>
<td>44.559610</td>
<td>-0.305991</td>
<td>0.7615</td>
</tr>
<tr>
<td>CRR</td>
<td>-14.993050</td>
<td>25.795610</td>
<td>-0.581221</td>
<td>0.5649</td>
</tr>
<tr>
<td>LIQR</td>
<td>-17.304540</td>
<td>14.921870</td>
<td>-1.159677</td>
<td>0.2543</td>
</tr>
</tbody>
</table>

R² = 0.961377; Adjusted R² = 0.954561; F-statistic = 141.0496; Prob (F-statistic) = 0.000000

*Source: Author’s computation using Eviews 9.*

Based on the OLS results, the estimated equation for the study will appear as follows:

\[ TCR = 1219.711 + 0.590303TCPS + 0.164067TFREV + 4.210018DPRT - 13.63484PLR - 14.99305CRR - 17.30454LIQR + \mu \]

In line with Coefficient of Determination (R²) shown in the OLS result earlier presented, it is clear that the independent variables selected for the study have the capacity to cause 96.14 per cent variations in the dependent variable. On the other hand, only 3.86 per cent of variations in the dependent variable is caused by forces outside the model. This result proves that the model is robust and capable of providing adequate direction and answer (s) to the question being investigated in the study. Besides the R², the adjusted R² also shows the strength of the model when the number of variables and observations are taken into consideration. In this case, the adjusted R² is 95.46 per cent. The probability of F-statistic of 0.000000 shows that the overall model is significant at 5 per cent level of significance.

From the OLS results, all the variables of the study are correctly signed as expected. TFREV, TCPS and DPRT exhibited positive relationships while CRR, PLR and LIQR exhibited negative relationships with the dependent variable (TCR) as expected.

TCPS exhibits a positive and statistically significant relationship with TCR. This implies that N1 billion increase in TCPS will result in N0.590303 billion increase in TCR. The coefficient of DPRT indicates a positive and statistically non-significant relationship with TCR; implying that one percentage point increase in DPRT will result in N4.210018 billion increase in TCR. It is worthy of note here that when deposit rate is high, depositors will be encouraged to deposit their funds in the bank and this will increase the stock of funds available for intermediation. In any case, increase in deposit rates will also lead to increase in lending rates so that banks may enjoy reasonable spread.
Quite interesting and revealing is the fact that coefficient of TFREV which represents TSA in the study assumes a positive and statistically non-significant relationship with TCR; implying that N1 billion increase in TFREV will result in N0.164067 billion increase in TCR. This further proves that Federal Government Revenues (both Oil and non-Oil revenues) over the years support financial intermediation as they increase the stock of money in circulation. This is not doubtful as government revenue left with banks can support their intermediation function. Also, government revenue support government expenditures which are capable of engendering employment and consequently increase bank deposits which ultimately increase total amount of funds available for lending for productive purposes.

**Table 4.6: Parsimonious Error Correction Mechanism**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>877.242900</td>
<td>423.435600</td>
<td>2.071727</td>
<td>0.0467</td>
</tr>
<tr>
<td>D(TCPS)</td>
<td>3.534116</td>
<td>0.477560</td>
<td>7.400357</td>
<td>0.0000</td>
</tr>
<tr>
<td>D(TFREV(-1))</td>
<td>-0.773483</td>
<td>0.500345</td>
<td>-1.545900</td>
<td>0.1323</td>
</tr>
<tr>
<td>D(DPRT)</td>
<td>-169.150000</td>
<td>120.589600</td>
<td>-1.402691</td>
<td>0.1706</td>
</tr>
<tr>
<td>D(PLR(-1))</td>
<td>-20.486020</td>
<td>95.993640</td>
<td>-0.213410</td>
<td>0.8324</td>
</tr>
<tr>
<td>D(CRR)</td>
<td>202.455400</td>
<td>100.710600</td>
<td>2.010270</td>
<td>0.0532</td>
</tr>
<tr>
<td>D(LIQR(-1))</td>
<td>-25.938070</td>
<td>38.712340</td>
<td>-0.670021</td>
<td>0.5078</td>
</tr>
<tr>
<td>D(ECM(-1))</td>
<td>-0.524170</td>
<td>0.780648</td>
<td>-0.671455</td>
<td>0.5069</td>
</tr>
</tbody>
</table>

Adjusted R-Square = 0.648039; Durbin Watson = 1.505476; F-statistic = 10.99522; Prob(F-statistic) = 0.000001

Source: Author’s computation using Eviews 9.

In order to correct the short run disequilibrium indicated by the cointegration test; Error Correction Mechanism (ECM) was applied and the result shown in Table 4.5. The ECM results show that 52.42 percent of the short run disequilibrium will be corrected per annum in order to meet up with the long run equilibrium position. Besides, the ECM results show that the independent variables can explain about 64.8 per cent of variations in the dependent variable. Furthermore, an F-statistic of 10.99522 and Prob (F-statistic) of 0.000001 confirm the overall strength of the model with Durbin-Watson statistic of 1.505476 indicating absence of serial correlation.

**Conclusion**

Treasury Single Account, a recent initiative of the federal Government of Nigeria, which is designed to create one account for all government revenues in a bid to ensure transparent, accountable, effective and efficient management of government funds and reduce domestic borrowing cost, among others, was tested in order to predict the future of banks financial intermediation in Nigeria. All the expectations of the study were met in terms of direction of relationship. Findings from the study reveal that federal government revenue impacts bank lending positively though not significantly. Consequently, removal of government funds from the banking sector portends some negative impact for the sector. Increase in deposit interest rate tends to increase volume of deposits available for lending. Increase in total credits to the private sector will certainly increase the total credits to the economy. Decrease in PLR will encourage borrowers to access loans from banks as their cost of funds will be low and that portends business continuity and profitability. Both CRR
and LIQR are meant to reduce the amount of funds available for lending with a view to enhancing stronger banks through reduction of inherent loans losses which are not foreseeable. This is supported by their negative relationships with the TCR. It is quite clear that only credit to the private sector has a significant relationship with TCR both in the short and long runs.

It is recommended that the federal government should adopt a more liberal TSA model that would not stifle commercial banks in order to secure a better and more liquid financial system. Moreover, banks should increase credits to the real sector for increased activities and consequently increase cash flows for lending rather than wait for government revenue to enhance their intermediation activities.

It is recommended further that future research should be directed at ascertaining the reasons behind government’s increased debt portfolio in the wake of Treasury Single Account.

References


APPENDICES

APPENDIX I

Table 4.3: Results of Unrestricted Cointegration Rank Trace Test

<table>
<thead>
<tr>
<th>Hypothesised No. Of CE(s)</th>
<th>Eigen value</th>
<th>Trace statistic</th>
<th>0.05 Critical value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.818662</td>
<td>224.250700</td>
<td>139.275300</td>
<td>0.0000</td>
</tr>
<tr>
<td>Atmost 1</td>
<td>0.788860</td>
<td>157.662400</td>
<td>107.346600</td>
<td>0.0000</td>
</tr>
<tr>
<td>Atmost 2</td>
<td>0.649140</td>
<td>97.008240</td>
<td>79.341450</td>
<td>0.0013</td>
</tr>
<tr>
<td>Atmost 3</td>
<td>0.510590</td>
<td>56.160920</td>
<td>55.245780</td>
<td>0.0414</td>
</tr>
<tr>
<td>Atmost 4</td>
<td>0.345742</td>
<td>28.293290</td>
<td>35.010900</td>
<td>0.2179</td>
</tr>
<tr>
<td>Atmost 5</td>
<td>0.241454</td>
<td>11.747430</td>
<td>18.397710</td>
<td>0.3282</td>
</tr>
<tr>
<td>Atmost 6</td>
<td>0.024558</td>
<td>0.969730</td>
<td>3.841466</td>
<td>0.3247</td>
</tr>
</tbody>
</table>

Trace test indicates 4 cointegrating equations at the 0.05 level

Source: Author’s computation using Eviews 9.

APPENDIX II

Table 4.4: Results of Unrestricted Cointegration Rank Max-Eigenvalue Test

<table>
<thead>
<tr>
<th>Hypothesised No. Of CE(s)</th>
<th>Eigen value</th>
<th>Trace statistic</th>
<th>0.05 Critical value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0.818662</td>
<td>66.588210</td>
<td>49.586330</td>
<td>0.0004</td>
</tr>
<tr>
<td>Atmost 1</td>
<td>0.788860</td>
<td>60.654210</td>
<td>43.419770</td>
<td>0.0003</td>
</tr>
<tr>
<td>Atmost 2</td>
<td>0.649140</td>
<td>40.847310</td>
<td>37.163590</td>
<td>0.0180</td>
</tr>
<tr>
<td>Atmost 3</td>
<td>0.510590</td>
<td>27.867630</td>
<td>30.815070</td>
<td>0.1100</td>
</tr>
<tr>
<td>Atmost 4</td>
<td>0.345742</td>
<td>16.545860</td>
<td>24.252020</td>
<td>0.3704</td>
</tr>
<tr>
<td>Atmost 5</td>
<td>0.241454</td>
<td>10.777700</td>
<td>17.147690</td>
<td>0.3295</td>
</tr>
<tr>
<td>Atmost 6</td>
<td>0.024558</td>
<td>0.969730</td>
<td>3.841466</td>
<td>0.3247</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 3 cointegrating equations at the 0.05 level

Source: Author’s computation using Eviews 9.
Abstract

The primary purpose of this study is to explore the determinants of CEO bonus compensation: to examine CEO bonuses and to explore whether or not the independent variables are associated with CEO bonus compensation. For the purposes of this study, a sample of 2,448 CEO bonus compensations across 1,622 firms from 1997 to 2002 was used to test several hypotheses. The dependent variable in this model is the CEO bonus compensation. Bonus is the dollar value of the bonus (cash and non-cash) earned by the named executive officer during the fiscal year. Corporate diversification was divided into two categories; international diversification and industry diversification. Firm performance is measured by both Market-based, Performance (RET) and Accounting-based, Performance (ACE). The results show that the higher the degree of international diversification, and the higher accounting earnings performance, the more CEOs receive in bonuses. In addition, this study found that international diversification is associated with a greater use of bonuses and with a greater reliance on accounting-based, rather than market-based measures of firm performance. The results also demonstrated that CEOs in firms with more investment opportunities will receive higher bonuses than CEOs in firms with fewer investment opportunities and CEOs in larger firms will receive higher bonuses than CEOs in smaller firms.

JEL classification: M4, M12

Keywords: CEO bonus compensation, corporate diversification, international diversification, industrial diversification, investment opportunity, stock ownership

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INTRODUCTION

Chief executive officer (CEO) compensation and its relationship to corporate performance has become an important issue in managerial, economic, accounting, and financial circles (Pavlik, Scott, & Tiessen, 1993). In the past decade, CEO compensation has drawn considerable public scrutiny (Cyert, Kang, & Kumar, 2002; Gaver & Gaver, 1993, 1995; Crystal, 1991; Byrne, 1996; Lublin, 1996; Lambert & Larcker, 1987). The researchers have examined the relationship between CEO compensation and corporate governance mechanisms (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). Moreover, a growing number of researchers have found a link between incentive compensation and performance (Kaplan, 1994; Jensen & Murphy, 1990). Research has shown that CEOs of growth firms receive a larger portion of their compensation from long-term incentive compensation, while those of non-growth firms receive a larger portion of their pay from fixed salary.

Decision makers, such as boards of directors, investors, shareholders and CEOs, construct optimal compensation contracts that reduce agency cost and maximize shareholder wealth. Consequently, it is important to understand international diversification and industrial diversification effects on CEOs’ bonuses.

The dependent variable in this model is the CEO bonus compensation designated as (BONUS). Bonus is the dollar value of the bonus (cash and non-cash) earned by the named executive officer during the fiscal year. Corporate diversification has been divided into international diversification and industrial diversification (Duru & Reeb, 2002; Kim, Kim, & Pantzalis, 2001). International diversification was defined as a firm’s expansion beyond the borders of its domestic country across different countries and geographical regions (Capar & Kotabe, 2003). Industrial diversification entails expansion into different lines of business (industries) segments (Kim, Kim, & Pantzalis, 2001).

The rest of the paper is organized as follows. Section 2-literature review and hypotheses development, section 3-outlines the research design, data and methodology, section 4-results and discussion of findings, section 5-reports on and discussion of the empirical results, and section 6-conclusions from our findings.

EMPirical LITERATURE AND HYPOTHESES DEvELOPMENT

Corporate diversification is separated into an international diversification and industrial diversification for this study (Kim, Kim, & Pantzalis, 2001). This study employs the concept of corporate diversification identified by Duru and Reeb (2002) and Kim, et al., (2001) that divides corporate diversification into international diversification and industrial diversification.

In order to explore whether corporate diversification impacts bonuses, this study utilized the agency theory to assert that when the contract between the principal and the agent is outcome based, the agent is more likely to behave in the interests of the principal; so increasing the CEO bonus will maximize shareholders wealth. This study also utilized the expectancy theory hypothesis that the higher bonus motivation will have higher firm performance; so increasing CEO bonus motivation will have the better firm performance. Therefore, this study applied both agency theory and expectancy theory to become a simple combination model. As a result, agency theory and expectancy theory imply that higher CEO bonuses will have higher motivation to CEOs; higher bonus motivation will have higher firm performance, accordingly, higher firm performance will maximize shareholder wealth.

INTERNATIONAL DIVERSIFICATION AND CEO BONUSES

International operations are more profitable than comparable domestic operations (Fatemi, 1984). This differential provides firms with an incentive to expand beyond national boundaries to maintain their competitiveness, and diversify their international operations across multiple markets and operational units (Duru & Reeb, 2002; Kim, Kim & Pantzalis, 2001; Fatemi, 1984). Complexity is manifested in differing operational segments, customers, suppliers, types of labor, cultures, laws, rules, regulations, and capital markets (Duru & Reeb, 2002; Gomez-Mejia & Palich, 1997). When corporations diversify internationally, operations result in a more complex managerial decision-making environment (Duru & Reeb, 2002; Finkelstein & Hambrick, 1989). International diversification also requires enhanced information processing and requires specialized knowledge of competitors’ operations as well as the firm’s own operations across boundaries (Sanders & Carpenter, 1998; Nohria & Ghoshal, 1994). When the firm’s diversification affects the complexity of the operating environment, it becomes more difficult for boards to directly monitor executive performance across different markets (Sanders & Carpenter, 1998; Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992; Nilakant & Rao, 1994; Zajac & Westphal, 1994). Sanders and Carpenter (1998) em-
philosophy that subsidiary managers may be even more difficult to monitor than domestic managers.

A portfolio of operations associated with the international dispersion of sales, assets, and personnel makes information processing more difficult for boards (Daft, 1992). This results in increased agency costs due to the increased cost and difficulty of monitoring executives from their home offices (Roth & O’Donnell, 1996). Moreover, based on expectancy theory, higher executive bonus motivation results in higher firm performance (Vroom, 1964). Under the expectancy theory, individuals will tend to maximize executive rewards and shareholder wealth, and minimize the costs and difficulty of monitoring performance (Hahn & Kleiner, 2002). Studies have also shown that international diversification is positively associated with executive compensation (Sanders & Carpenter, 1998; Henderson & Fredrickson, 1996). Boards of directors offering CEO bonus packages that are aligned with the maximization of shareholder wealth can resolve problems associated with monitoring executives (Sanders & Carpenter, 1998; Eisenhardt, 1989; Jensen & Murphy, 1990).

Taken together, the increased complexity of international operations increases the shareholders and board of directors’ difficulty of monitoring CEO, thereby better aligning CEOs’ interests with stockholders’ interests, increasing CEO bonus except for fixed-pay salary. The CEO is more likely to behave in the interests of the principal, which result in high agency costs. In order to reduce the shareholders and board of directors difficulty of monitoring the CEO, increase of the CEO bonus of motivation based on expectancy theory is used to motivate managers to work harder in the complexity of international operations to increase performance in making decisions that were consistent with shareholder wealth maximization. When the performance improved, the expected compensation reward was produced.

Thus, this study predicts that international diversification is positively associated with CEO bonus. Therefore, it can be expected that

Hypothesis H2: International diversification is positively associated with CEO bonus.

**Industrial diversification and CEO bonuses**

Corporate diversification into different industries creates a portfolio of operational units (Kim, Kim & Pantzalis, 2001). Industrial diversification potentially benefits corporate managers through increased power through compensation (Denis, Densi & Yost, 2002; Stulz, 1990). Managerial compensation is tied to a firm’s size (Jensen & Murphy, 1990). Industrial diversified firms are characterized by lower managerial equity ownership (Amihud, Jakov & Lev, 1981), so decreases in industrial diversification are often precipitated by market disciplinary forces, such as corporate control threats (Denis, Denis, & Sarin, 1997). Increasing the number of business segments can result in increasing the monitoring difficulties. Consequently, managers might reduce shareholders’ wealth through increases in agency cost due to overinvestment (Kim, Kim & Pantzalis, 2001). Additionally, Denis, Denis and Yost (2002) find that global diversification has increased over time and is correlated with the decline in industrial diversification over the same period. Compared to international diversification, which is value-enhancing to compensation, industrial diversification is value-reducing to compensation (Duru & Reeb, 2002). Given that research studies have found that industrial diversification reduces shareholder wealth, this study predicts that industrial diversification results in relatively low compensation (Duru & Reeb, 2002; Denis, Denis & Yost, 2002).

Agency theory propositions assert that when the contract between the principal and the agent is outcome based, the agent is more likely to behave in the interests of the principal. Based on agency theory, the firms with more business segments; higher degree of industrial diversification may disperse optional risk, which causes the firms to pay less bonus compensation to CEOs, thereby, reducing agency cost. Therefore:

Hypothesis H2: Industrial diversification is negatively associated with CEO bonus.

**Firm performance and CEO bonuses**

Researchers (Duru & Reeb, 2002; Balkin, Markman, & Gomez-Mejia, 2000; Grossman & Holkisson, 1998) have indicated that companies in different industries are likely to have different measures of company performance. Two types of company performance measures are the accounting-based measure of performance and the market-based measure of performance. Sanders and Carpenter (1998) point out that firms with high levels of performance may be able to pay more compensation than those that are performing less well.

Consistent with previous literature researchers, the accounting- based measure of performance for this study is defined as annual earnings before interest and taxes (EBIT); the market-based measure of perfor-
mance is defined as the common stock return at the end of the fiscal year.

**Market-based measures of performance**

Market-based measures of performance are often centered around some measure of the price of a single share of a company’s outstanding stock on a common stock exchange and stock return. Stock performance is usually measured by changes in stock prices or stock return.

Therefore, firms in industries that experience rapid growth, or involve rapid product cycles, may benefit from aligning their executives’ bonus with market-based measures of performance (Grossman & Hossikson, 1998).

**Accounting-based measures of performance**

Accounting-based performance measures are incrementally useful over market-based measures in CEO compensation contracts (Duru & Reeb, 2002; Holmstrom, 1979; Banker & Datar, 1989; Bushman & Indjejikian, 1993; Baber et al., 1996). In an accounting-based measure of company performance, researchers typically use profitability or stockholders’ equity (Dyl, 1988; Tosi & Gomez-Mejia, 1994). Profitability is usually measured as EPS or ROA or EBIT and stockholder equity as ROE. The measures of EBIT, ROE and ROA are easily determined, perceived to be objective, and widely understood by owners and managers alike (Grossman & Hossikson, 1998). According to Pavlik, Scott and Tiessen (1993), accounting performance is more important than stock performance with respect to cash compensation. Financial ratios are widely used in accounting-based measures in firm performance. Some researchers have relied on an internal performance measure, such as profit (Ciscel & Carroll, 1980; Deckop, 1988; Lewellen & Huntsman, 1970), or return on equity (ROE)(Redling, 1981), or change in shareholder return (Murphy, 1985; Platt, 1987), or a combination of nine measures of performance, including sales, profit, return on equity (ROE), and earnings per share (EPS) (Gomez-Mejia, et al., 1987).

Moreover, previous empirical evidence suggests that accounting-based, performance measures are incrementally useful over market-based, measures in executive compensation contracts (Duru & Reeb, 2002; Holmstrom, 1979; Banker & Datar, 1989; Bushman & Indjejikian; 1993; Baber, Janakiraman, & Kang, 1996). When accounting returns are less informative with respect to the executive’s actions, there is a greater reliance on market-based measures than on accounting-based measures (Smith & Watts, 1992; Gaver & Gaver, 1993; Baber et al., 1996; Bryan, Hwang, & Lilien, 2000). Executives have discretion in choosing among various accounting or reporting alternatives, which can be used to manipulate accounting earnings. Because of the ability and incentive of executives to arbitrage differing accounting and tax regimes, international settings have a higher likelihood of earnings manipulation than domestic settings (Duru & Reeb, 2002; Scholes, Wilson, & Woflson, 1992). Moreover, the potential for imperfect hedging on foreign exchange exposure suggests that accounting-based performance measures are more useful than market-based performance measures when there is international diversification (Duru & Reeb, 2002).

Taken together this study based on the expectancy theory utilized the high bonus of motivation strategy to motivate CEOs to increase firm performance in an effort that is consistent with shareholder wealth maximization. The performance improved, thereby, producing the expected CEO bonus reward as the expectancy theory proposition asserts that increasing motivation increased performance outcome. Therefore, it can be expected that

Hypothesis $H_3$: Market-based performance is positively associated with CEO bonus.

Hypothesis $H_4$: Accounting-based performance is positively associated with CEO bonus.

**Accounting-based performance measures, market-based performance measures and CEO bonus**

In addition, Pavlik, Scott, and Tiessen (1993) found that accounting performance is more important than stock performance with respect to cash compensation. Stock return appears to be more important when the compensation includes shareholding and options. Singh and Agarwal (2002) found that short-term compensation will be better predicted by accounting-based performance measures than by market-based performance measures. In addition, Gaver and Gaver (1995) found that CEOs of growth firms receive a larger portion of their compensation from long-term incentive compensation; whereas, those of non-growth firms receive a larger portion of their pay from fixed sala-
ry. Moreover, prior studies have documented the fact that accounting earnings play a significant role in measuring performance for the purpose of compensation (Jensen & Murphy, 1990). Thus, this study argues that short-term compensation such as bonus will be better predicted by accounting-based performance measures than by market-based performance measures.

This leads to the following hypothesis:

Hypothesis $H_2$: CEO bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

**Investment opportunity and CEO bonus**

CEOs know corporate investment opportunities and are often the investment decision makers (Bryan, Hwang & Lilien, 2000). It is difficult for shareholders to alleviate this information asymmetry without having specialized knowledge. Therefore, such firms are likely to rely on CEO compensation (Bryan, Hwang & Lilien, 2000; Smith & Watts, 1992; Bizjak, Brickley & Coles, 1993; Gaver & Gaver, 1993). Shareholder wealth depends especially upon the successful exploitation of investment opportunities (Myers, 1977). Cyert, Kang and Kumar (2002) found that investment opportunities not only affect CEO effort, but also make the firm more attractive for takeovers, and therefore influence CEO compensation (Smith & Watts, 1992).

Firms with abundant investment opportunities increase the shareholders and board of directors’ difficulty in monitoring their CEO, thereby better aligning the CEOs’ interests with the stockholders’ interests, and increasing bonus, the CEO is more likely to behave in the interests of principal, thereby raising agency costs to pay higher levels of bonus to their CEOs (Gaver & Gaver, 1993).

Thus, this study predicts that investment opportunities are positively associated with CEO bonus. Hence:

Hypothesis $H_3$: Investment opportunities are positively associated with CEO bonus.

**Firm size and CEOs bonus**

Firm size effects managerial compensation (Jensen & Murphy, 1990; Sanders & Carpenter, 1998). Firm size is the key determinant of CEO pay (Singh & Agarwal, 2003). Moreover, firm size affects firm diversification (Kim, Kim & Pantzalis, 2001). If firm size is positively associated with a firm’s international diversification, then it should have similar implications for CEO bonuses. CEOs who work in large firms with a high international diversification should also be compensated for the increased work burden they carry. Empirical research finds that firm size is positively associated with executive compensation (Sanders & Carpenter, 1998; Finkelstein & Hambrick, 1996; Gaver & Gaver, 1995; Geomez-Mejia, 1994). Higher levels of bonus except for the fixed-pay salary are expected to be paid to executives in larger firms (Gaver & Gaver, 1995) because the larger the scope of operations, the greater the demands on top executives. Moreover, since executives who manage larger and more complex firms require greater knowledge and ability than do executives of smaller and less complex firms, they require a higher level of bonus compensation on the external labor market (Becker, 1964; Rosen, 1982).

Ueng, Wells, and Lilly (2000) examined the determinants of CEO pay for small as well as large firms. He found that firm size is a primary factor in determining CEO pay within small firms. Sales volume (Baker, Jensen & Murphy, 1988; Newman & Banister, 1998) and total assets (Baumol, 1959; Marris, 1963; Sridharan, 1996; Useng, et al., 2000) are two generally used measures of firm size. Firm size is generally measured by assets, but sales can also be used to determine firm size. Sales volume is also considered a measure of firm size because firms earn profit for the company through the volume of sales; the higher the sale volume sold, the higher the firm profit. In a small firm, because of the small number of units sold, even a big increment in managerial efficiency does not yield a large increase in total profits. Large firms are also often more operationally complex than small firms; CEOs of large firms, consequently, have the more difficult task of managing them. International diversification and industrial diversification firms generally have a larger scope of operations with complex work environments requiring higher bonus compensation for their CEOs.

This study extends previous research to examine whether firm size is related to CEOs bonus. Thus, this study predicts that firm size is positively associated with CEO bonus compensation, where CEOs from firms with high international diversification have more complex work than domestic CEOs in domestic environments. This study thereby argues that firm size impacts the effect of international and industrial diversification on CEO bonuses.
Hypothesis H₁: Firm size is positively associated with CEO bonus.

**Stock ownership and CEO bonus**

CEO stock ownership was negatively associated with salary, equity-based and discretionary compensation (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). When CEOs hold a large fraction of their firms' outstanding stock, the CEOs are acting more as owners or shareholders than employees are. Therefore, it reduces the principal and agency relationship on agency theory, since CEOs are acting as owners rather than employees, thus, the demand for compensation is likely to be reduced, because the interests of CEOs and shareholders are already relatively aligned (Bryan, Hwang & Lilien, 2000; Jensen & Meckling, 1976).

Moreover, international diversification firms involve more complex work than domestic firms, and industrial diversification firms involve multi-segments business, which increases the complex work over single segment firms. In order to encourage the CEOs work for shareholders' interests, higher international diversified firms and multi-segments business firms offer higher proportions of stock, making the CEOs act as shareholders, meanwhile, reducing agency costs and the requirement of CEO bonus compensation.

Bryan, Hwang & Lilien, (2000) found that CEO ownership is significantly negatively related to restricted stock grants for the whole sample and for both subsamples. Ryan and Wiggins (2002) explored a negative relationship between the CEO's fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. This study extended previous research to examine whether stock ownership is related to CEO bonus. Therefore, this study predicts that stock ownership is negatively associated with CEO bonus, when CEOs hold a large fraction of their firms' outstanding stock; it reduces the agency cost and CEO bonus. Therefore, it can be expected that

Hypothesis H₇: Stock ownership is negatively associated with CEO bonus.

**Data and methodology**

This study identified eight hypotheses associated as determinants of CEO stock bonus compensation.

They are listed as follows:

Hypotheses H₁, H₂, H₃, H₄, H₅, H₆, H₇, H₈.

Hypothesis H₈: International diversification is positively associated with bonus.

Hypothesis H₉: Industrial diversification is negatively associated with bonus.

Hypothesis H₁₀: Market-based performance is positively associated with bonus.

Hypothesis H₁₁: Accounting-based performance is positively associated with bonus.

Hypothesis H₁₂: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

Hypothesis H₁₃: Investment opportunities are positively associated with bonuses.

Hypothesis H₁₄: Firm size is positively associated with bonus.

Hypothesis H₁₅: Stock ownership is negatively associated with bonus.

**Research model**

**The compensation model**

A regression model was developed to test the hypotheses. The compensation function discussed in the next sections is modeled as:

$$CEOs\ Bonus_i = f(INTD, INDD, RET, ACE, IO, SIZE, OWN, Tenure, Age, Duality, Gender)$$

When $$i = c$$, CEO compensation structure = CEOs bonus compensation

$$INTD = \text{International Diversification}$$

$$INDD = \text{Industrial Diversification}$$

$$RET = \text{Market-based measure of performance}$$

$$ACE = \text{Accounting-based measure of performance}$$

$$IO = \text{Investment Opportunities}$$

$$SIZE = \text{Firm Size}$$

$$OWN = \text{Stock Ownership}$$

$$Tenure = \text{CEO position tenure}$$

$$Age = \text{CEO age}$$

$$Duality = \text{CEO duality}$$

$$Gender = \text{CEO gender}$$
The dependent variable in this model is the level and structure of CEOs stock bonus compensation, including CEO bonus Compensation designated as (BONUS). Bonus is the dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year. ExecuComp database was the source for the data. The independent variables in the study are as follows: International Diversification (INTD), Industrial Diversification (INDD), Firm performance (FP), Investment Opportunity (IO), Firm Size (SIZE), and Stock Ownership (OWN). COMPSTAT’s Geographic Segment File, COMPSTAT’s Industry Segment File, COMPSTAT’s database, and the CRSP database obtained the data for the independent variables. Firm performance is measured by both Market-based, Performance (RET) and Accounting-based, Performance (ACE). Market-based, Performance (RET) is measured as the common stock return at the end of the fiscal year. Accounting-based Performance (ACE) is measured as annual earnings before interest and taxes (EBIT). The control variables are CEO position, tenure, age, duality, and gender.

Table 1 summarizes the dependent, independent and control variables included in the model as well as the measure and source for each variable. In total, the model includes a dependent variable (BONUS), seven independent variables (INTD, INDD, RET, ACE, IO, SIZE, OWN), and four control variables (tenure, age, duality, gender).

Table 1: Dependent, Independent and Control Variable in Regression Model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Measures (Source)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEOs Stock Bonus Compensation</td>
<td>The dollar value of a bonus (cash and non-cash) earned by the named CEO officer during the fiscal year.</td>
</tr>
<tr>
<td>International Diversification (INTD)</td>
<td>Firms are classified as multinational if they report any foreign sales on COMPSTAT’s Geographic Segment File, otherwise, they are classified as domestic firms. COMPSTAT limits the number of global segments to five, including the domestic segment.</td>
</tr>
<tr>
<td>Industrial Diversification (INDD)</td>
<td>Firms are classified as multi-segment on COMPSTAT’s Industry Segment File, if they report more than one business segment on COMPSTAT’s Industry Segment File, otherwise, they are classified as single-segment. COMPSTAT limits the number of industrial segments to 10.</td>
</tr>
<tr>
<td>Market based Performance (RET)-firm performance</td>
<td>The common stock return at the end of the fiscal year.</td>
</tr>
<tr>
<td>Accounting based Performance (ACE)-firm performance</td>
<td>Annual earnings before interest and taxes (EBIT).</td>
</tr>
<tr>
<td>Investment opportunity (IO)</td>
<td>Research and development expenditures divided by the market value of the firm.</td>
</tr>
<tr>
<td>Firm Size (SIZE)</td>
<td>Total assets as a measure of firm size.</td>
</tr>
<tr>
<td>Stock ownership (OWN)</td>
<td>The percentage of the company’s shares owned by the named CEO officer.</td>
</tr>
<tr>
<td>Tenure</td>
<td>The number of years that the CEO has held his/her current position at the end of the fiscal year.</td>
</tr>
<tr>
<td>Age</td>
<td>Age of CEO at the end of the fiscal year.</td>
</tr>
<tr>
<td>Duality</td>
<td>Considered 1 if the CEO is the chairman, 0 otherwise.</td>
</tr>
</tbody>
</table>

Source: Own elaboration.
A multiple regression model was established to identify the determinants of CEO bonus compensation. CEO bonus was selected as the dependent variable (Y) to be predicted by the independent variables, control variables.

The regression analysis tested the relationship between independent variables and CEO bonus. Therefore, the models for estimation become:

\[
BONUS_{it} = c_0 + c_1 \text{INTD} + c_2 \text{INDD} + c_3 \text{RET} + c_4 \text{ACE} + c_5 \text{IO} + c_6 \text{SIZE} + c_7 \text{OWN} + c_8 \text{Tenure} + c_9 \text{Age} + c_{10} \text{Duality} + c_{11} \text{Gender} + \epsilon_{it}
\]

Where, \( c_0 \) is the constant of regression equation model 1

\( c_1, c_2, c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{11} \) = coefficient of \text{INTD}, \text{INDD}, \text{RET}, \text{ACE}, \text{IO}, \text{SIZE}, \text{OWN}, \text{Tenure}, \text{Age}, \text{Duality}, \text{Gender}

\( BONUS \) denotes bonus compensation for a firm at time period \( t \); it is a dependent variable in equation 1.

\text{INTD} denotes international diversification.

\text{INDD} denotes industrial diversification.

\text{ACE} denotes accounting-based performance and is measured by annual earnings before interest and taxes (EBIT).

\text{RET} denotes market-based performance and is measured by the common stock return at the end of the fiscal year.

\text{IO} denotes investment opportunities and is measured by R & D expenditures scaled by the market value of the firm.

\text{SIZE} denotes firm size and is measured by total assets.

\text{OWN} denotes stock ownership and is measured by the percentage of the company’s shares owned by the named CEO officer.

\text{Tenure} denotes CEO’s tenure and is the number of years that the CEO had held his/her current position at the end of the fiscal year.

\text{Age} denotes CEO’s age and is the age of the CEO at the end of the fiscal year.

\text{Duality} denotes CEO’s duality and refers to the situation in which a CEO holds both the CEO and chairperson of the board positions.

Gender denotes CEO’s gender and is the proxy gender of CEO, dummy variables, 1= male; 0= female

\( \epsilon_{it} \) is the error term (all measured for firm \( i \) at time period \( t \)).

**Sample and data collection**

The sample consisted of secondary data selected from three databases and supplemented with additional data from the Security and Exchange Commission (SEC). Company stock-return data from the Center for Research in Security Prices (CRSP) along with financial statement data made available from Standard & Poor’s Research Insight was included. The ExecuComp database, based on the S&P 400, S&P 500, and S&P 600 indexes that comprise large, mid, and small-cap firms was selected for use because it reduces the time investment required to extract data from proxy statements and alleviates the difficulty of extracting specific information from individual company reports. However, there is often missing data, particularly relating to age and employment starting dates. Thus, it was necessary to supplement information in the ExecuComp database with information contained in Lexis/Nexis.

CEO stock bonus compensation data selected from Standard & Poor’s COMPUSTAT ExecuComp (1997-2002) covers total compensation and current compensation, such as salary and bonuses. The data also contains long-term compensation, such as long-term incentive plans, restricted stocks, stock appreciation rights, and stock options granted. Most studies of CEO stock bonus compensation rely upon secondary data from filings with the Securities and Exchange Commission (Miller, 1995). International diversification data obtained from COMPUSTAT’s Geographic Segment File classified firms as multinational, if firms report any foreign sales on COMPUSTAT’s Geographic Segment File; otherwise, they are domestic firms. COMPUSTAT limits the number of global segments to five. Industrial diversification data obtained from COMPUSTAT’s Industry Segment File classified firms as multi-segment if they report more than one business segment; otherwise, they are single-segment firms. COMPUSTAT limits the number of industrial segments to ten.

This study classified each firm’s primary Standard Industrial Classification (SIC) Code according to the 10-K product breakdown (SIC), and classified each firm according to the industry classification scheme suggested by Lippert and Moore (1995) and further modified in this study. CEO was included only if that individual was listed on the firm’s financial statement during 1997-
-2002 and remained with the same firm for at least five years. This sample selection method is also consistent with Miller (1995). For this study, 2,448 CEOs across 1,622 firms during the period 1997-2002 were identified. Frequency statistics for sample firms are presented in Tables 2 and 3.

Table 2: Frequency Statistics for Sample Firms (n = 1,622)

<table>
<thead>
<tr>
<th>Panel A: Filing Year</th>
<th>Observations</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>113</td>
<td>7.0</td>
</tr>
<tr>
<td>1998</td>
<td>145</td>
<td>8.9</td>
</tr>
<tr>
<td>1999</td>
<td>1067</td>
<td>65.9</td>
</tr>
<tr>
<td>2000</td>
<td>193</td>
<td>11.9</td>
</tr>
<tr>
<td>2001</td>
<td>100</td>
<td>6.3</td>
</tr>
<tr>
<td>2002</td>
<td>4</td>
<td>0.0</td>
</tr>
<tr>
<td>Total firms</td>
<td>1622</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Type of Industry</th>
<th>SIC Codes</th>
<th>Observations</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace and shipbuilding</td>
<td>3720-3829</td>
<td>65</td>
<td>4.0</td>
</tr>
<tr>
<td>Agriculture and metal</td>
<td>0000-1099, 1400-1499</td>
<td>18</td>
<td>1.1</td>
</tr>
<tr>
<td>Cars</td>
<td>3711-3716</td>
<td>26</td>
<td>1.6</td>
</tr>
<tr>
<td>Chemical, tire, and leather</td>
<td>2800-2821, 3011-3199</td>
<td>42</td>
<td>2.6</td>
</tr>
<tr>
<td>Commodity</td>
<td>4812-4899</td>
<td>36</td>
<td>2.2</td>
</tr>
<tr>
<td>Computer and software</td>
<td>3570-3579, 7370-7389</td>
<td>180</td>
<td>11.1</td>
</tr>
<tr>
<td>Construction, wood, furniture, and house</td>
<td>1500-1799, 2400-2599, 2840-2844, 3200-3299</td>
<td>58</td>
<td>3.6</td>
</tr>
<tr>
<td>Electric</td>
<td>3661-3699</td>
<td>115</td>
<td>7.1</td>
</tr>
<tr>
<td>Entertainment</td>
<td>7000-7369, 7400-7999</td>
<td>62</td>
<td>3.8</td>
</tr>
<tr>
<td>Finance</td>
<td>6000-6799</td>
<td>141</td>
<td>8.7</td>
</tr>
<tr>
<td>Food and tobacco</td>
<td>2000-2199</td>
<td>42</td>
<td>2.6</td>
</tr>
<tr>
<td>Health, education, and law</td>
<td>8000-9999</td>
<td>64</td>
<td>3.9</td>
</tr>
<tr>
<td>Machinery</td>
<td>3510-3569, 3580-3652</td>
<td>88</td>
<td>5.4</td>
</tr>
<tr>
<td>Medical, photo, and other</td>
<td>3841-3999</td>
<td>54</td>
<td>3.3</td>
</tr>
<tr>
<td>Paper and publishing</td>
<td>2600-2673, 2711-2780</td>
<td>54</td>
<td>3.3</td>
</tr>
<tr>
<td>Petroleum and refinery</td>
<td>1220-1389, 2911-2999</td>
<td>64</td>
<td>3.9</td>
</tr>
<tr>
<td>Retail and wholesale</td>
<td>5000-5999</td>
<td>201</td>
<td>12.4</td>
</tr>
<tr>
<td>Steel</td>
<td>3300-3496</td>
<td>62</td>
<td>3.8</td>
</tr>
<tr>
<td>Textile</td>
<td>2200-2399</td>
<td>25</td>
<td>1.5</td>
</tr>
<tr>
<td>Transportation</td>
<td>4011-4799</td>
<td>42</td>
<td>2.6</td>
</tr>
<tr>
<td>Utility</td>
<td>4911-4991</td>
<td>106</td>
<td>6.5</td>
</tr>
<tr>
<td>Other</td>
<td>2833-2836, 2851-2891</td>
<td>77</td>
<td>4.7</td>
</tr>
<tr>
<td>Total firms</td>
<td>1622</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration.
### Panel A: Filing Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Observations</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>335</td>
<td>13.8</td>
</tr>
<tr>
<td>1998</td>
<td>414</td>
<td>16.9</td>
</tr>
<tr>
<td>1999</td>
<td>828</td>
<td>33.8</td>
</tr>
<tr>
<td>2000</td>
<td>438</td>
<td>17.9</td>
</tr>
<tr>
<td>2001</td>
<td>362</td>
<td>14.9</td>
</tr>
<tr>
<td>2002</td>
<td>71</td>
<td>2.9</td>
</tr>
<tr>
<td>Total CEOs</td>
<td>2,448</td>
<td>100.0</td>
</tr>
</tbody>
</table>

### Panel B: Type of Industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>SIC Codes</th>
<th>Observations</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Aerospace and shipbuilding</td>
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<td>1.7</td>
</tr>
<tr>
<td>Chemical, tire, and leather</td>
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<td>73</td>
<td>3.0</td>
</tr>
<tr>
<td>Commodity</td>
<td>4812-4899</td>
<td>47</td>
<td>1.9</td>
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<tr>
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<td>299</td>
<td>12.2</td>
</tr>
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<td>1500-1799, 2400-2599, 2840-2844, 3200-3299</td>
<td>86</td>
<td>3.5</td>
</tr>
<tr>
<td>Electric</td>
<td>3661-3699</td>
<td>161</td>
<td>6.6</td>
</tr>
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<td>Entertainment</td>
<td>7000-7369, 7400-7999</td>
<td>93</td>
<td>3.8</td>
</tr>
<tr>
<td>Finance</td>
<td>6000-6799</td>
<td>190</td>
<td>7.8</td>
</tr>
<tr>
<td>Food and tobacco</td>
<td>2000-2199</td>
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<td>2.8</td>
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<td>3.8</td>
</tr>
<tr>
<td>Machinery</td>
<td>3510-3569, 3580-3652</td>
<td>138</td>
<td>5.6</td>
</tr>
<tr>
<td>Medical, photo, and other</td>
<td>3841-3999</td>
<td>81</td>
<td>3.3</td>
</tr>
<tr>
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<td>3300-3496</td>
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<td>2200-2399</td>
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</tr>
<tr>
<td>Transportation</td>
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<td>2.5</td>
</tr>
<tr>
<td>Utility</td>
<td>4911-4991</td>
<td>160</td>
<td>6.5</td>
</tr>
<tr>
<td>Other</td>
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<td>115</td>
<td>4.7</td>
</tr>
<tr>
<td>Total CEOs</td>
<td>2,448</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Own elaboration.*
Results and discussion of findings

Statistical tests

The current study makes use of several statistical tests provided by SPSS as follows:

1) descriptive statistics: means and standard deviations,

2) Pearson correlation coefficients were calculated to determine whether multicollinearity among the dependent variables is severe or not,

3) multiple regression analysis was employed to examine the relationship between independent variables and CEOs bonus compensation.

Descriptive statistics

Table 4 presents the following statistics for the variables in our regression model: mean, median, standard deviation, and minimum and maximum. The sample statistics are divided into the dependent variable and seven independent variables (Panel A), control variables (Panel B) and firm characteristics (Panel C) for the period 1997-2002. The average CEO in the sample was approximately 57 years, had been in the CEO position approximately 14 years, and had total compensation of approximately $2.35 million. A vast majority were male and about two-thirds of sample CEOs also held the Chairman position. Mean and median bonuses during the period (1997-2002) are $576,860,000 and $311,080,000 respectively.

Table 4: Descriptive statistics

<table>
<thead>
<tr>
<th>Panel A: Variables</th>
<th>Number of Observations a</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonus</td>
<td>2,448.00</td>
<td>576.86</td>
<td>311.08</td>
<td>950.53</td>
<td>0.00</td>
<td>11,980.69</td>
</tr>
<tr>
<td>International Diversification</td>
<td>2,448.00</td>
<td>3.29</td>
<td>3.00</td>
<td>1.11</td>
<td>0.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Industrial Diversification</td>
<td>2,448.00</td>
<td>2.55</td>
<td>2.33</td>
<td>1.57</td>
<td>1.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Market-based Performance</td>
<td>2,448.00</td>
<td>0.01</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.13</td>
<td>1.03</td>
</tr>
<tr>
<td>Accounting-based Performance</td>
<td>2,448.00</td>
<td>525.29</td>
<td>99.47</td>
<td>2,140.96</td>
<td>-10,537.00</td>
<td>39,093.50</td>
</tr>
<tr>
<td>Investment Opportunities</td>
<td>1,465.00</td>
<td>0.05</td>
<td>0.02</td>
<td>0.10</td>
<td>0.00</td>
<td>1.82</td>
</tr>
<tr>
<td>Firm size(Assets)</td>
<td>2,448.00</td>
<td>7,994.00</td>
<td>1,199.97</td>
<td>35,813.94</td>
<td>8.66</td>
<td>692,789.00</td>
</tr>
<tr>
<td>Stock Ownership</td>
<td>2,448.00</td>
<td>8,984.05</td>
<td>0.28</td>
<td>444,303.97</td>
<td>0.00</td>
<td>21,982,950.44</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Control Variable</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenure  (day)</td>
<td>1,069.00</td>
<td>2,947.66</td>
<td>2,192.00</td>
<td>2,774.43</td>
<td>13.00</td>
<td>19,935.00</td>
</tr>
<tr>
<td>Age</td>
<td>1,288.00</td>
<td>56.91</td>
<td>57.00</td>
<td>7.75</td>
<td>36.00</td>
<td>89.00</td>
</tr>
<tr>
<td>Duality  c</td>
<td>2,448.00</td>
<td>0.56</td>
<td>0.67</td>
<td>0.45</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Gender d</td>
<td>2,448.00</td>
<td>0.96</td>
<td>1.00</td>
<td>0.18</td>
<td>0.00</td>
<td>1.00</td>
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</table>

<table>
<thead>
<tr>
<th>Panel C: Firm Characteristic (000s)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>2,448.00</td>
<td>7,994.00</td>
<td>1,199.97</td>
<td>35,813.94</td>
<td>8.66</td>
<td>692,789.00</td>
</tr>
<tr>
<td>Sales</td>
<td>2,448.00</td>
<td>4,346.94</td>
<td>1,102.44</td>
<td>11,799.42</td>
<td>0.00</td>
<td>180,041.33</td>
</tr>
<tr>
<td>Capital Exp</td>
<td>2,426.00</td>
<td>312.11</td>
<td>51.39</td>
<td>1,270.14</td>
<td>0.00</td>
<td>31,672.50</td>
</tr>
<tr>
<td>EBIT/Sales</td>
<td>2,445.00</td>
<td>89.70</td>
<td>0.51</td>
<td>796.75</td>
<td>-10,537.00</td>
<td>30,877.00</td>
</tr>
<tr>
<td>R&amp;D/Sales</td>
<td>1,464.00</td>
<td>0.22</td>
<td>0.03</td>
<td>2.70</td>
<td>0.00</td>
<td>96.10</td>
</tr>
<tr>
<td>Capital Exp/ Sales</td>
<td>2,423.00</td>
<td>0.13</td>
<td>0.05</td>
<td>1.75</td>
<td>0.00</td>
<td>85.68</td>
</tr>
<tr>
<td>Market Value/ Capital Exp</td>
<td>2,364.00</td>
<td>64.27</td>
<td>24.10</td>
<td>264.19</td>
<td>0.05</td>
<td>10,996.64</td>
</tr>
</tbody>
</table>

a Compustat’s Geographic Segment file limits the number of global segments to five; b Compustat’s Industry Segment file limits the number of global segments to ten; c 0 = CEO is not chairperson; 1 = CEO is also chairperson; d 0 = female, 1 = male; e $ thousands

Source: Own elaboration.
Test for multicollinearity

Because multicollinearity between independent variables can cause large variances and covariances for the estimators of the regression coefficients, it becomes difficult to distinguish their relative influences. This problem is addressed by deriving the correlation coefficient matrix shown in Table 5 using the Pearson correlation coefficient test.

The correlation matrix in Table 5 shows that the strongest correlation coefficient among the independent variables was 0.751 between firm size and accounting-based performance. The second highest correlation coefficient was 0.418 between firm size and industrial diversification. Gujarati (1988) suggests that simple correlations between independent variables should not be considered “harmful” unless they exceed 0.80 or 0.90. The Pearson correlations coefficient suggests that multicollinearity is not severe for the independent variables in this study.

Table 5: Pearson Correlation Coefficient Matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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<tbody>
<tr>
<td>1. Bonus</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. International Diversification</td>
<td>.101**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Industry Diversification</td>
<td>.225**</td>
<td>.146**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Market based Performance</td>
<td>-.087**</td>
<td>.009</td>
<td>.013</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Accounting based Performance</td>
<td>.548**</td>
<td>.080**</td>
<td>.327**</td>
<td>-.085**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Investment opportunities</td>
<td>-.090**</td>
<td>.352**</td>
<td>.084**</td>
<td>.048</td>
<td>.298**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Stock ownership</td>
<td>.112**</td>
<td>.108**</td>
<td>.149**</td>
<td>.029</td>
<td>.188**</td>
<td>.089**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>8. Firm size</td>
<td>.506**</td>
<td>.121**</td>
<td>.418**</td>
<td>-.052**</td>
<td>.751**</td>
<td>-.138**</td>
<td>-.254**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. Genderb</td>
<td>.027</td>
<td>.016</td>
<td>-.036</td>
<td>.012</td>
<td>.008</td>
<td>.017</td>
<td>.056**</td>
<td>-.025</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Age</td>
<td>.075**</td>
<td>.002</td>
<td>.065**</td>
<td>-.019</td>
<td>.125**</td>
<td>-.007</td>
<td>.169**</td>
<td>.119**</td>
<td>.108**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Duality</td>
<td>.226**</td>
<td>.039</td>
<td>.097**</td>
<td>-.022</td>
<td>.251**</td>
<td>-.003</td>
<td>.105**</td>
<td>.267**</td>
<td>.023</td>
<td>.271**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12. Tenure</td>
<td>.276**</td>
<td>.046</td>
<td>.034</td>
<td>-.047</td>
<td>.195**</td>
<td>-.120**</td>
<td>.341**</td>
<td>.089**</td>
<td>.127**</td>
<td>.369**</td>
<td>.297**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: values * of n ranged from 1,069 to 2,4488. **p < 0.01; ***p < .05. This table shows the correlations between variables by using Pearson Correlation Coefficients.

Source: Own elaboration.
MULTIPLE REGRESSION ANALYSIS AND HYPOTHESES TESTING

To test hypotheses 1 through 8, hierarchical regression was employed. The first step was to enter the control variables (tenure, age, duality and gender) into the equations. The second step was to enter, into the equations, the various independent variables representing international diversification, industrial diversification, investment opportunities, firm size, firm performance, and stock ownership. The significance of the change in $R^2$ from steps 1 to 2 provides a test of whether the set of predictor variables in step 2 explain a significant amount of the variance in CEO bonus beyond that already explained by the control variables.

FOR THE REGRESSION MODEL 1 BONUS COMPENSATION

Table 6 reports the results of the hierarchical regression bonus compensation model, which examined hypotheses $H_1$, $H_2$, $H_3$, $H_4$, $H_5$, $H_6$, $H_7$, $H_8$.

Table 6: Hierarchical Regression of CEOs Bonus on Hypothesis $H_1$, $H_2$, $H_3$, $H_4$, $H_5$, $H_6$, $H_7$, $H_8$. Model 1

\[ \text{BONUS}_{ij} = b_0 + b_1 \text{INTD} + b_2 \text{INDD} + b_3 \text{RET} + b_4 \text{ACE} + b_5 \text{IO} + b_6 \text{SIZE} + b_7 \text{OWN} + b_8 \text{Tenure} + b_9 \text{Age} + b_{10} \text{Duality} + b_{11} \text{Gender} + \epsilon_{ij} \]

<table>
<thead>
<tr>
<th>Variables</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( \Delta R^2 )</th>
<th>( \Delta F )</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenure</td>
<td>.123***</td>
<td>7.114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.014</td>
<td>-.859</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duality</td>
<td>.061**</td>
<td>3.462</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.029†</td>
<td>-1.753</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2:</strong></td>
<td></td>
<td></td>
<td>.276</td>
<td>147.793***</td>
</tr>
<tr>
<td>Predictor Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Diversification</td>
<td>.037*</td>
<td>2.151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Diversification</td>
<td>.010</td>
<td>.563</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market-based Performance</td>
<td>-.042**</td>
<td>-2.554</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting-based Performance</td>
<td>.370***</td>
<td>14.256</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Opportunities</td>
<td>.035*</td>
<td>1.931</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Size</td>
<td>.198***</td>
<td>7.468</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock Ownership</td>
<td>-.013</td>
<td>-.726</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall R^2 and F</td>
<td>.351</td>
<td></td>
<td>119.771***</td>
<td></td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>.348</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\( ^a \text{n = 2446} \) Beta weights and t-values reflect results for the full model and subsequent models
\( ^\dagger p < .10; ^* p < .05; ^** p < .01; ^*** p < .001 \)

Source: Own elaboration.
Table 7 reports the results of the estimated two models (controls variables only and a full model), which included control variables plus the main effects of the independent variables to examine hypotheses H1, H2, H3, H4, H5, H6, H7, H8.

Hypothesis H4: Accounting-based performance is positively associated with bonus.

Hypothesis H5: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

Hypothesis H6: Investment opportunities are positively associated with bonus.

Hypothesis H7: Firm size is positively associated with bonus.

Hypothesis H8: Stock ownership is negatively associated with bonus.

Table 7: Results of Regression Equations Model 1 Analysis for CEOs Bonus Compensation

\[
BONUS_{it} = c_0 + c_1\text{INTD} + c_2\text{INDD} + c_3\text{RET} + c_4\text{ACE} + c_5\text{IO} + c_6\text{SIZE} + c_7\text{OWN} + c_8\text{Tenure} + c_9\text{Age} + c_{10}\text{Duality} + c_{11}\text{Gender} + \varepsilon_{it}
\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>c1 International Diversification (INTD)</td>
<td>.037* (2.151)</td>
<td></td>
</tr>
<tr>
<td>c2 Industry Diversification (INDD)</td>
<td>.010 (.563)</td>
<td></td>
</tr>
<tr>
<td>c3 Market based Performance (RET)</td>
<td>-.042** (-2.554)</td>
<td></td>
</tr>
<tr>
<td>c4 Accounting based performance (ACE)</td>
<td>.370*** (14.256)</td>
<td></td>
</tr>
<tr>
<td>c5 Investment Opportunities (IO)</td>
<td>.035* (1.931)</td>
<td></td>
</tr>
<tr>
<td>c6 Firm Size (SIZE)</td>
<td>.198*** (7.468)</td>
<td>.123*** (7.114)</td>
</tr>
<tr>
<td>c7 Stock Ownership (OWN)</td>
<td>-.013 (-.726)</td>
<td>-.014 (-.859)</td>
</tr>
<tr>
<td>c8 Tenure</td>
<td>.152*** (7.628)</td>
<td>.123*** (7.114)</td>
</tr>
<tr>
<td>c9 Age</td>
<td>.004 (.222)</td>
<td>-.014 (-.859)</td>
</tr>
<tr>
<td>c10 Duality</td>
<td>.199*** (9.858)</td>
<td>.061** (3.462)</td>
</tr>
<tr>
<td>c11 Gender</td>
<td>-.045* (2.294)</td>
<td>-.029* (1.753)</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.074</td>
<td>.348</td>
</tr>
<tr>
<td>Change in adjusted $R^2$</td>
<td>.075***</td>
<td>.276***</td>
</tr>
</tbody>
</table>

Note. \( \hat{n} = 2446 \) Beta weights and t-values reflect results for the full model \( p < .10; * p < .05; ** p < .01; *** p < .001 \). When the predicted sign is either (+) or (-), then the p value is a one-tailed test; when the predicted sign is (?), then the p value is a two-tailed test.

Source: Own elaboration.
An examination of the zero-order correlations (Table 5 Pearson Correlation Coefficient Matrix) reveals that bonus compensation is correlated with the seven measures of predictor variables (international diversification = .101; industrial diversification = .225; market-based performance = -.087; accounting based performance = .548; investment opportunities = -.090; stock ownership = -.112; firm size = .506). To test the relationship between the seven independent variables as a whole and total compensation, a hierarchical regression model was created by entering the control variables in step 1 and the seven independent variables in step 2 as discussed above. Results of the regression are shown in Table 7. Standardized regression weights (beta) are reported for ease in comparing the strength of the relationship between bonus compensation and the various predictor variables in each regression model.

As indicated by the significant overall F score (119.771, p < .001), the total set of predictor variables was significantly related to bonus compensation. In addition, the set of predictor variables explained 34.8% (adjusted R²) of the variance in the dependent of bonus compensation.

For the hypothesis H₁: International diversification is positively associated with bonus. The results of international diversification (β = .037, t = 2.151, p < .05) show that there is a positive significant relationship between international diversification and bonus compensation. Thus, the results support the hypothesis H₁ that international diversification is positively associated with bonus compensation. The results demonstrated that the higher the degree of international diversification, the higher the bonus compensation paid to CEOs.

For the hypothesis H₂: Industrial diversification is negatively associated with bonus. The industrial diversification analysis (β = -.010, t = .563, p > .1) indicates that industrial diversification is not negatively associated with bonus compensation. Therefore, the null hypothesis cannot be rejected; the findings show that industrial diversification is not significantly associated with bonus compensation. Thus, the hypothesis H₂ was not supported.

For the hypothesis H₃: Market-based performance is positively associated with bonus. The market-based performance analysis (β = -.042, t = -2.554, p < .01) indicates that market-based performance is negatively and significantly associated with bonus compensation. As with hypothesis H₃, the predicted sign was opposite. Thus, ultimately no support was provided for the hypothesis H₃.

For the hypothesis H₄: Accounting-based performance is positively associated with bonus. The accounting-based performance analysis (β = .370, t = 14.256, p = .000) shows that accounting-based performance is positively and significantly associated with bonus compensation. Thus, the results support the hypothesis H₄ that accounting-based performance is positively associated with bonus compensation. Thus, the results support the hypothesis H₄ that accounting-based performance is positively associated with bonus compensation. The results demonstrated that CEOs in higher earnings firms will receive higher bonus compensation than CEOs in lower earnings firms.

For the hypothesis H₅: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures. As Tables 5 (zero-order correlation analysis) and Tables 7 (regression analyses) show, there is support for the hypothesis H₅. This means that accounting-based performance is positively correlated with bonus compensation (.548) at significant levels (p < .05), and market-based performance (-.087) is less significant, which supports the hypothesis H₅. In the hierarchical regression analysis (Table 7), accounting-based performance is a significant predictor of bonus compensation (.370, p < .001) and adds incrementally to the adjusted R². Market-based performance is also a significant predictor of bonus compensation (-.042, p < .001), as predicted. In contrast to accounting-based performance, the results, as predicted, show that bonus compensation is better predicted by accounting-based performance measures (β = .370) than by market-based performance measures (β = -.042).

For the hypothesis H₆: Investment opportunities are positively associated with bonuses. The investment opportunities analysis (β = .035, t = 1.931, p < .05) shows that there is a positively significant relationship between investment opportunities and bonus compensation. Thus, the results support the hypothesis H₆ that investment opportunities are positively associated with bonus compensation. The results demonstrated that CEOs in firms with more investment opportunities will receive higher total compensation than CEOs in firms with fewer investment opportunities.

For the hypothesis H₇: Firm size is positively associated with bonus.

The firm size analysis (β = .198, t = 7.468, p = .000) shows that there is a positively significant relationship between firm size and bonus compensation. Thus, the results support the hypothesis H₇ that firm size is positively associated with bonus compensation. The results
demonstrated that CEOs in larger firms will receive higher bonus compensation than CEOs in smaller firms.

For the hypothesis $H_2$: Stock ownership is negatively associated with bonus.

The stock ownership analysis ($\beta = -0.013$, $t = -0.726$, $p > .1$) indicates that industrial diversification is negatively associated with bonus compensation. The findings show that stock ownership is not significantly associated with bonus compensation. Thus, hypothesis $H_2$ was not supported.

Taken together, these results provide support for hypotheses $H_1$, $H_3$, $H_4$, $H_6$. The data did not support hypotheses $H_2$, $H_5$, $H_8$.

**Conclusions**

The purpose of this research was to examine CEO bonuses and to explore whether or not the independent variables (international diversification, industrial diversification, market-based performance, accounting-based performance, investment opportunities, firm size, and stock ownership) were associated with CEO bonuses.

**Significant research findings**

Duru and Reeb found that there is a positive relationship between international diversification and total compensation and incentive compensation. This study builds in their findings by exploring in more detail the relationship between independent variables and CEO bonuses. The results demonstrated that the higher the degree of international diversification, the higher the bonus compensation paid to CEOs.

Duru and Reeb (2002) found that there is a negative relationship between industrial diversification and total compensation, and there is a positive relationship between industrial diversification and incentive compensation. This study extends their study to examine in more detail whether industrial diversification is negatively associated with CEO bonus compensation. The result shows that there is no relationship between industrial diversification and CEO bonus compensation.

Contrary to findings in prior studies, there is little evidence that uses of CEO bonus compensation paid increases with stock return performance, as traditionally measured.

In addition, the results demonstrated that firms with higher earnings will pay higher bonus compensation to their CEOs, which is consistent with Singh and Agarwal (2002) finding that there is a positive relationship between accounting-based performance and bonus compensation. These results are also consistent with Pavlik, Scott, and Tiessen’s (1993) finding that accounting earning performance is more important than stock return performance with respect to cash compensation such as bonus.

Duru and Reeb (2002) found that investment opportunities are positively related to total compensation and incentive compensation. This study extended their research in more detail to examine whether investment opportunities are related to CEO bonus compensation. The results demonstrated that firms with more investment opportunities will pay their CEOs higher bonuses.

Firm size is the key determinant of CEO pay (Singh & Agarwal, 2003). Moreover, firm size affects firm diversification (Kim, Kim & Pantzalis, 2001). Empirical research finds that firm size is positively associated with executive compensation (Sanders & Carpenter, 1998; Finkelstein & Hambrick, 1996; Gaver & Gaver, 1995; Geomez-Mejia, 1994). This study extended their research to examine whether firm size is related to CEO bonuses. The results demonstrated that firm size is a positive relationship with CEO bonuses, which explains the firms with the larger scope of operations have greater demands on top executives and will expect to pay the higher levels of bonus except for the fixed-pay salary as the motivating strategies.

Grace (2004) found that incentive compensation as a percentage of total compensation decreased in solvency regulatory attention and CEO stock ownership. Bryan, Hwang & Lilien, (2000) found that CEO ownership is significantly negatively related to restricted stock grants for the whole sample and for both subsamples. Ryan and Wiggins (2002) explored a negative relationship between the CEO’s fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. This study extends previous research in more detail to examine whether stock ownership is negatively associated with CEO bonuses. The findings show that stock ownership is not related.

**Limitations of this study**

The limitations of this study provide future research opportunities. This study uses sample data based on years; future researchers should consider using quarterly or monthly sample data to examine the
relationship between independent variables and CEO bonus compensation. More detailed data may enhance the accuracy of the research.

This study uses only NYSE and NASDAQ data; future research may attempt to examine organizations in other countries or other market exchanges.

This study focused on CEO bonuses; future studies might include research on executive and employee compensation, which may provide more objective information on compensation. Many companies such as hi-tech companies offer bonus compensation to their employees, which may be an important consideration in overall compensation packages.

References


Abstract
Mobile banking has been a game changer for financial organizations in terms of remote banking services. However, many customers remain uncertain due to its security. Therefore, improving the comprehension of the customer’s reasons and methods of using bank sites, including their behaviour towards e-banking, is crucial. This article discusses the matter by suggesting a technology acceptance model that integrates the theory of the planned behavior model in the classic TAM model with trust and perceived risk in order to elucidate the aspects that influence users’ acceptance of mobile banking applications in Palestine. This study is designed to give both theoretical and empirical support for e-commerce adoption. We are also capable in providing particular marketing ideas for practitioners in relation to the uptake of mobile banking.

JEL classification: O1, O16
Keywords: TAM, TPB mobile banking, perceived risk, trust, Palestine

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INTRODUCTION

Mobile banking, as one of the avant-garde and modern technologies, is an example of an excellent breakthrough in mobile technology in the banking sector, allowing consumers to make financial transactions independently using mobile devices, smartphones, or Personal Digital Assistants (PDAs) at their preferred time and location (Ali A Alalwan, Dwivedi, Rana, & Simintiras, 2016; Karjaluoito, Püschel, Mazzon, & Hernandez, 2010).

According to Lin (2013), banks appear to be increasingly driven to incorporate mobile banking channels into their logistical systems, and significant financial and technical resources have been invested in this effort. As a result, banks worldwide have spent over $115 billion to integrate mobile banking technology into their systems (Ali Abdallah Alalwan, Dwivedi, & Rana, 2017). This surge in mobile banking could be linked to new advancements in mobile and telecommunications technology at first. Moreover, this revolution delivers solutions that enable banks to easily service their customers with the highest quality over wide territories, especially where internet networks or the establishment of traditional branches are restricted (Wessels & Drennan, 2010).

Furthermore, by expanding the number of mobile users worldwide, the potential market for mobile banking systems will grow and captivate more clients, thus meeting the needs of both customers and banks (Ali A Alalwan, et al., 2016; Gu, Lee, & Suh, 2009; Wessels & Drennan, 2010). For instance, according to Compete, the total number of mobile banking users is predicted to extend to 1 billion (Ali Abdallah Alalwan, et al., 2017).

However, the utilization price of mobile banking services is not as high as projected, particularly in developing nations, and customers show little interest in such services (Hanafizadeh, Behboudi, Koshksaray, & Tabar, 2014; Hanafizadeh, et al., 2014; Purwanegara, Apiringish, & Andika, 2014; Weerakkody, El-Haddadeh, Al-Sohbi, Shareef, & Dwivedi, 2013). According to a survey conducted by KPMG International in 2009, which interviewed over 4000 mobile services users in 19 countries worldwide (Cruz, Neto, Munoz-Gallego, & Laukkanen, 2010), mobile banking users accounted for 19% of all mobile phone users. Similarly, when more new banking technology emerges, Palestinian banking clients showed decreased enjoyment and enthusiasm in online banking channels in general and viewed mobile banking as a new technology (Hanafizadeh, et al., 2014).

As a result, it may be claimed that the largest hurdle for this technology’s success is persuading people to utilize it as a permanent replacement for existing channels (Laukkanen, Sinkkonen, Kivijärvi, & Laukkanen, 2007). In reality, because mobile banking is still in its infancy in underdeveloped countries, like Palestine, several scholars (Khrewesh, 2011; Khodakarami & Chan, 2013; AbuShanab, Pearson, & Setterstrom, 2010; Tarhini, El-Masri, Ali, & Serrano, 2016; Jouda, Abu Jarad, Obaid, Abu Mdallalah, & Awaja, 2020), have looked into the challenges surrounding this technology. They also demand more information in the Palestinian context. As a result, the gap in the literature on mobile banking may be summarized as the need to propose a theoretical model that best defines the adoption of mobile banking from the perspective of Palestinian clients. Furthermore, modern statistical tools such as structural equation modelling (SEM) should be used to analytically examine pertinent aspects influencing mobile banking intention and usage in Palestine. As a result, in order to close this gap, the purpose of this study is to empirically evaluate the most relevant elements that could affect Palestinian customers’ willingness to use mobile banking.

LITERATURE REVIEW

Evaluating and understanding client intent and the adoption of mobile banking is a focus for scholars and practitioners around the world currently, and the related literature of online banking channels has experienced a dramatic growth (Purwanegara, et al., 2014; Zhou, 2012a). Indeed, researchers are gradually attempting to explain how customers create their views, attitudes, intentions, and behavior regarding mobile banking utilizing various techniques and theoretical underpinnings (Ali A Alalwan et al., 2016, Hanafizadeh et al., 2014).

Laforet and Li (2005) looked into the elements that influence online banking acceptance and usage in China. They looked into the issue of gender and discovered that the majority of internet banking users in China are men. Furthermore, security is one of the variables influencing M-banking acceptance, but risk, computing, skills required to use new technologies, and culture are barriers to M-banking adoption in that country. Hanafizadeh and Khedmatgazar (2012) tried to find out if bank customers’ understanding of the services and benefits of IB is successful in minimizing the adverse influence of customers’ perceived risk on their desire to embrace IB. The findings revealed that IB awareness is a factor in lowering all dimensions of per-
ceived risk (including time, financial, performance, social, security, and privacy risks). Furthermore, it is discovered that, with the exception of social risk, other variables of perceived risk have a considerable negative impact on IB adoption desire.

Sharma and Sharma (2019) looked into Saudi Arabia's embrace of online banking. The study's findings concern the internet connection's quality. The perceived usefulness and perceived ease of use of online banking are positively ruled by understanding of online banking and its benefits, social influence, and computer self-efficacy. Education, trust, and aversion to change all factor in attitudes toward the possibility of internet banking adoption in this study.

Nyeko, Moya, Kabaale, and Odongo, (2014) looked into the factors that influence internet banking adoption in Oman. The results reveal the concerns about security and data confidentiality as key impediments to internet banking adoption. Support from upper management was also a stumbling block to the deployment of electronic commerce applications. The banks in Oman were "very slow" to establish e-banking services, according to this survey. While they believe that online services cut costs greatly, a combination of client concerns, technical investment costs, and a lack of market awareness all make e-banking "unattractive." Nasri and Charfeddine (2012) conducted research into the elements that influence internet banking adoption in Tunisia. The technology acceptance model (TAM) and the theory of planned behaviour were applied (TPB). In addition to perceived usefulness, perceived ease of use, attitude, social norms, perceived behaviour control, and intention to use internet banking, their model included security and privacy, self-efficacy, government assistance, and technology assistance. The adoption of internet banking was affected for several reasons.

Karjaluoto, Riquelme, and Rios (2010) looked into the moderating effect of gender on mobile banking uptake. The research aimed to analyze what attracts present online banking users in Singapore to adopt mobile banking, with gender as an operating variable. Research revealed that utility, social norms and social risk are the three elements which are the most impactful on the desire to use mobile banking services. Female respondents are more affected by ease of use than male users, and male respondents are more affected by relative advantage in terms of perceived utility. Female respondents are more greatly affected by social norms (or the importance of others in the decision) than male respondents. Abdul-Hamid, Shaikh, Boateng, and Hinson (2019) compared internet banking practices in Malaysia and Thailand. Based on the result, these countries differ in the basic services provided by their commercial banks. The usefulness of internet banking in both nations was further harmed by the belief that there was a lack of effort put into educating people about internet banking.

Hinson (2011) conducted research on mobile banking for the underprivileged. If the traditional financial setup does not allow the poor to access financial services such as banking, the poor could be offered banking services through mobile technology, according to this study. The study developed a Mobile Banking Model, which theorized the fundamental ways in which mobile phone technology may be leveraged to improve impoverished people's access to banking. Singh and Kaur (2012) did research to compare pre-login and post-login features of online portals from banks of choice. According to the findings, certain banks' online portals differ in terms of account information, fund transfers, online requests, and general information. Sripalawat, Thongmak, and Ngramyarn (2011) looked at the elements influencing the acceptance of M-banking, both on the adoption and barrier sides, in order to investigate the consequences of factors, to guide banks and financial firms in gaining more clients, and to compare the differences and similarities of M-banking triumph factors across countries. Findings revealed the positive factors to have a greater impact on M-banking intention than negative factors.

Cruz et al. (2010) investigated the barriers to M-banking adoption among Brazilian internet users. The data revealed that the majority of customers have never utilized these services. The primary impediments to utilizing M-banking services, according to them, are risk, expense, complexity, and little understanding about the corresponding benefits of the services. In their study, Cruz et al. (2010) also looked at the elements that influence M-banking adoption. They were looking for roadblocks. Use, value, risk, tradition, and image were among the variables considered. The study revealed that providing information and assistance by banks has a substantial impact on lowering usage barriers, image, value, and risk in M-banking, but proved no impact on lessening the tradition barriers.

Wessels and Drennan (2010) did a test on analyzing the important elements encouraging and discouraging M-banking adoption, including the effect of a user’s attitude on intention to use. Research revealed that perceived usefulness, perceived risk, cost, and compatibility all affects M-banking uptake. The attitude toward M-banking was used as a moderating variable in this study. Karjaluoto, Koenig Lewis, Palmer, and Moll (2010) conducted research titled Predicting the Contin-
ued Use of M-Banking Services by Young Users in England, with the goal of investigating M-banking adoption hurdles. Compatibility, perceived utility, and risk were key factors influencing M-banking uptake, based on the research. Compatibility is recognized as the foremost important independent variable determining perceived ease of use, perceived utility, and credibility, and it had a considerable positive effect on M-banking uptake. The characteristics of trust and credibility were noted to be substantial on lowering overall perceived risk.

Zhou (2012b) looked into the impact of trust on M-banking adoption. He deduced that rudimentary assurance and quality of facts are important aspects in establishing initial trust, and that information quality and system quality have a substantial effect on perceived use. He also came to the conclusion that trusts influences perceived use, and that the two elements affect the desire to utilize M-banking. M-banking adoption among young individuals was researched by (Akturan & Tezcan, 2012). Using the TAM model and the risks associated with M-banking adoption, they discovered that perceived use, social risk, performance risk, and perceived advantages all have a straight impact on people's attitudes. Attitude has a direct impact on the desire to use.

To sum up, while these studies have given us a better knowledge of the main elements that influence customer intention to use mobile banking, there are still several key points that demand clarification. The current study integrates components from the technology acceptance model (TAM) and theory of planned behavior (TPB) with perceived risk to forecast mobile banking uptake in Palestine, providing a foundation for further model refinement.

**Research model and propositions**

The advance technology acceptance model, which combines the theory of planned behavior model in the classic TAM model with perceived risk, was specifically introduced to clarify technology adoption via the consumer's perspective. TAM and TPB were frequently utilized to examine IT usage and e-service adoption throughout previous years (Shen, Huang, Chu, & Hsu, 2010). TAM and TPB, on the other hand, were not consistent in providing superior explanations or behavioral predictions (Chen, 2012). Because the two models are complementary, a growing body of research concentrated on integrating the models to investigate IT usage and e-service acceptance. The results have shown that the integration model has better explanatory power than the individual use of TAM and TPB (Glavee-Geo, Shaikh, & Karjaluoto, 2017). Since this study focuses on mobile banking service adoption, which is an example of innovative technology acceptance that is interlinked with social systems and personal characteristics, the utilization of TAM and TPB in the research structure should be broad in order to examine consumers' intentions and acceptance of mobile banking.

TAM is a modification of Ajzen and Fishbein (1975)'s theory of reasoned action (TRA) and was created to model user adoption of information technology (Davis, 1989). Two essential components in the TAM basic model predict behavioral intention to use: perceived usefulness and perceived ease of use. Davis (1989) termed perceived usefulness as the "degree to which an individual believes that employing a given method would boost his or her performance". On the other hand, perceived ease of use means "the degree to which a person believes that utilizing a certain system would be painless". As the system gets more beneficial and simple to use, individuals will want to utilize it more frequently. Otherwise, they will select any other system that meets the user's requirements. Furthermore, when users do not have to devote as much time learning or figuring out the way to use the system, it is thought to be more useful. As a result, perceived ease of use has a positive impact on perceived usefulness. Several studies regarding literature on mobile banking (Karjaluoto, Koenig-Lewis, et al., 2010) corroborate links outlined in TAM.

The TPB that underpins the TRA endeavor was found effective in predicting and explaining human behavior using various information technologies (Ajzen, 2002). According to TPB, an individual’s real actions in doing specific acts is directly controlled by his or her behavioral intention, which is in turn influenced by his or her attitude, subjective norms, and perceived behavioral controls. The degree of one's willingness to put effort into performing various activities is measured by behavioral intention. An individual’s favorable or unfavorable attitude (A) explains their evaluation of the action in question. Furthermore, the strength of the conduct and perceptions about the anticipated consequence are directly influenced by a favorable or unfavorable attitude. The perceived organizational or social pressure of a person who plans to perform the action in question is expressed as a subjective norm (SN). Karjaluoto, Riquelme, et al. (2010) stated that Subjective Norms (SN) have a sizeable impact on the adoption of M-banking services, according to their recent study. Their research was further backed up after they revealed that SN is one of the essential factors in persuading people to utilize mobile banking.
Perceived behavioral control (PBC) refers to a person’s perception of how easy or difficult it is to carry out a certain behavior. It is concerned with their perceptions of the presence of control elements that could aid or hinder their behavior’s performance. Furthermore, (Aboelmaged & Gebba, 2013) claimed that a user’s perception of behavioral control has a direct consequence on their willingness to utilize the internet for online shopping. Furthermore, (Karjaluoto, Püschel, et al., 2010) discovered that behavioral control has a major consequence on the desire to use mobile banking.

In the previous mobile banking literature, trust (TR) was regarded as an evaluative aspect in shaping a customer’s view of and willingness to adopt such technology (Ali Abdullah Alalwan, Dwivedi, Rana, & Williams, 2016, Hanafizadeh, et al., 2014; Luo, et al., 2010; Zhou, 2011, 2012). It is possible that this matter is linked to the unique nature of electronic banking services, which are marked by significant unpredictability, as well as the nature of financial services, which could be described as a high-risk product (Hanafizadeh et al., 2014).

In this study, perceived risk shows that feelings like worry, concern, discomfort, ambiguity, and cognitive dissonance may impact consumers’ decisions during the E-payment process (Cheah, Teo, Sim, Oon, & Tan, 2011) emphasised the relevance of risk in E-payment, particularly in the financial business, where the E-PaySIm™ E-payment is likewise governed by Bank Negara guidelines. Consumers evaluate banking relationships based on their level of trust and their perception of risk, assuming that the bank is acting in their best interests (Al-alak & Alnawas, 2010). As a result, in this study, trust and perceived risk have been introduced to the Model.

The following experimentation hypotheses were established based on the developed model. It is a requirement for us to investigate the subsequent TAM and TPB hypotheses in the context of online banking adoption as TAM and TPB are the base models. TAM is used to offer hypotheses 1, 2, 5, 6, and 7, while TPB is used to propose hypotheses 3 and 4.

**Perceived usefulness (PU)**

Many factual studies discovered that perceived usefulness has a notable and good impact on the intention to use (Alavi & Ahuja, 2016; Munir & Ilyas, 2017, Priya, Gandhi, & Shaikh, 2018). According to (Tam & Oliveira, 2017), intention to use mobile banking is
also influenced by perceived usefulness. In the study, perceived usefulness was found to have a favorable effect on behavioral intention to utilize mobile banking services. Mobile banking services are used by consumers who believe they are useful. According to the findings of Sharma and Sharma (2019), perceived usefulness in relation to mobile banking had a substantial impact on the intention to use for management students. Perceived usefulness was identified as one of the most important aspects that influence the intention to adopt information technology.

H1: Perceived usefulness positively influences the intention to use mobile banking.

**Attitude (at)**

Many studies in the field of e-business have found that an individual's attitude has a straightforward and considerable influence on their behavioral intention to employ a specific e-business application (Cudjoe, Anim, & Nyanyofio, 2015). For example, George (2004) discovered a favorable association connecting a person's attitude regarding online shopping and their behavioral intention. The adoption of wireless technology by users was investigated by Aboelmaged and Gebba (2013). In addition, Karjaluoto, Püschel, et al. (2010) found that attitude had a considerable influence on intent to use mobile banking.

They agreed that there is a line connecting views about adopting mobile commerce/banking and behavioral intent. As a result, the following theory is put forth:

H2: Attitude positively influences the desire to use mobile banking.

**Subjective norms: (sn)**

Subjective norms are eluded as an individual's "perception that the majority of key individuals in his life believe he should or should not conduct the behavior in question" (Ajzen & Fishbein, 1975). A recent study by (Karjaluoto, Koenig-Lewis, et al., 2010; Karjaluoto, Riquelme, et al., 2010) revealed that SN has notable impact on the M-banking services adoption. The study was backed up by Karjaluoto, Püschel, et al. (2010), which revealed that SN is a paramount important factor in persuading people to utilize mobile banking.

SN is defined as "perceived societal pressure toward adoption decisions," according to Ajzen (2002). Karjaluoto, Püschel, et al. (2010) went on to say that friends, relatives, and others in the same social group were the main sources of social pressure. As a result, the study merely shows that social pressure to use mobile banking services will most likely impact consumers' adoption of the services. As a result, the following theory is put forth.

H3: Subjective norm has positively influenced the intention to use mobile banking.

**Perceived behavioral control (pbc)**

Perceived behavioral control is a measure of how much people perceive they have power over performing the activity of interest. Individuals are said to be more eager to participate in actions over which they have power to control and participate less in actions in which they feel powerless. Consequently, an individual who believes he is competent for a particular action will display a behavioral intention to act.

Perceived behavioral control was counted as a good indicator of usage intention in previous research on online technology adoption (Baptista & Oliveira, 2015; Aboelmaged & Gebba, 2013). A user who believes he or she is capable of utilizing an e-business application will demonstrate a behavioral intent to use that application. Luo, Li, Zhang and Shim (2010) projected that users' perceived behavioral control may impact their desire to seek online options. This study investigates the following hypothesis based on the preceding argument:

H4: The intention to use mobile banking is positively influenced by perceived behavior control.

In turn, two major aspects controlling the technology function, perceived ease of use and perceived usefulness, determine TAM attitude (Davis, 1989; Igbaria, Parasuraman, & Baroudi, 1996). Mathieson, Peacock and Chin (2001) suggested that TAM is superior to other multi-attribute models like TRA and TPB at explaining stance on using an information system. “TAM reliably explains a considerable fraction of the variance [usually approximately 40%] in usage intentions and behavior, and TAM compares favorably with competing models such as the Theory of Reasoned Action and the Theory of Planned Behavior,” according to (Venkatesh & Davis, 2000). TAM claims that a person’s stance on using the system is influenced by their perceived usefulness. Employees in a performance-oriented e-business context are often rewarded for good performance and perks, according to Yang, Wong, Lai and Ntoko (2009). This means that recognizing the value of
e-business tools like mobile banking in boosting operations or productivity could have a favorable result on how people feel about them. Many studies have confirmed the influence of perceived utility on attitude, including (Hanudin, Baba, & Muhamad, 2007) and (Porter & Donthu, 2006). Therefore, the following hypothesis is advised:

H5: Perceived usefulness positively influences attitudes towards the use of mobile banking.

According to TAM, the perceived usefulness of technology is influenced by its simplicity of use. The larger the predicted benefits from a technology in terms of performance enhancement, the easier it is to utilize. This association has also been confirmed in the context of online technologies (Gefen, Karahanna, & Straub, 2003; McCloskey, 2006; Morosan & Jeong, 2008). We suggest the following hypothesis based on these arguments:

H7: The perceived usefulness of using mobile banking is influenced by perceived ease of usage.

**Trust (TR)**

The explanation of consumer’s trust in mobile banking is known as the collection of a consumer’s beliefs on ethics, compassion, as well as ability that may boost a consumer’s disposition to count on mobile banking to complete financial transactions (Gefen, et al., 2003). Trust has been researched on a large scale and has been found to be an essential element in determining client perceptions and intentions toward mobile banking (Hanafizadeh, et al., 2014). Trust, for example, has been shown to have huge consequences on a customer’s aim (Karjaluoto, Koenig Lewis, et al., 2010; Luo, et al., 2010). Zhou (2012b) validated trust as a major element establishing the probability of clients using mobile banking in his study to analyze the factors predicting customers’ initial trust in mobile banking. Trust and perceived credibility have been identified as significant drivers for the adoption of mobile banking by Iranian bank clients (Hanafizadeh, et al., 2014; Jouda, 2020). In relation to Gefen’s, et al., 2003 research, customers’ intent to utilize mobile banking are thought to be influenced directly by trust, and it could indirectly impact BI by raising the importance of relative advantage. As a result, the following theory is proposed in this study:

H8. Perceived Trust has a favorable impact on consumers’ desire to use mobile banking.

**Perceived risk (PR)**

The tech-influenced risks stemming from infrastructure, as well as relational risk stemming from a service provider’s behavior are the two elements of perceived risk (Akturan & Tezcan, 2012). Service providers are not able operate more properly than what was expected in the matter of dependability, instead opting for opportunism by taking advantage of unpredictable transactions (Akturan & Tezcan, 2012). Furthermore, due to the security weakness connected with mobile application technology, there is always the risk of mobile applications being hacked. Users’ trust in mobile banking is eroded as a result of technological and relational hazards, which reduces their intention to utilize mobile banking. Furthermore, consumers will choose to use branch banking or other traditional channels over mobile banking when the perceived risk is large. There has been various research that show a link between perceived risk and intention to use (Hanafizadeh, et al., 2014), (Chitungo & Munongo, 2013) and (Akturan & Tezcan, 2012). Thus, the following hypothesis is proposed.

H9: Risk perception has a detrimental impact on the desire to use mobile banking.

**Research methods**

**Operationalization of research variables**

The data collection method for measuring the key variables was either produced by adapting existing
measures to the context of research or by transforming construct formulations into a survey form. On a five-point Likert scale, all variables were evaluated. Table 1 summarized the different research variables and their dimensions, as well as the source of measuring scales.

**RESEARCH INSTRUMENT VALIDATION**

A total of 92 full-time students from two major universities in Gaza participated in a pretest of the research tool. Several items were refined as a result of the pretest. Some of the preliminary constituents were discovered to be ambiguous expressions of the research constructs, thus they were removed. A second pilot study was carried out with full-time undergraduate students using an online version of the instrument. The layout and operation of the online form were the focus of this test. The validity of the measures employed for study constructs are verified using principal component analysis with varimax rotation after the final data collection.

**SAMPLE**

The data from the study are to be gathered via the internet from the websites of two large banks that offer internet banking. For a few days, banner adverts will be used to elicit responses from the above websites. We anticipate receiving 250 replies to the survey.

<table>
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<th>Construct</th>
<th>Reference</th>
<th>Items</th>
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<tr>
<td>Intention to use mobile banking</td>
<td>(Luarn &amp; Lin, 2005)</td>
<td>My overall desire to use mobile banking is strong. In the near future I plan to increase my use of mobile banking.</td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>(Luarn &amp; Lin, 2005)</td>
<td>Using mobile banking to make banking operations would boost my efficiency It would be easier for me to execute banking transactions if I used mobile banking. I'd want to use mobile banking to conduct my banking operations.</td>
</tr>
<tr>
<td>Perceived ease of use</td>
<td>(Luarn &amp; Lin, 2005)</td>
<td>For me, learning how to use mobile banking is simple. It would be simple for me to learn how to use mobile banking. Mobile banking would be simple for me to utilize. Using mobile banking is inconvenient since I have to remember the access code each time I want to conduct another banking activity.</td>
</tr>
<tr>
<td>Perceived risk</td>
<td>(Luarn &amp; Lin, 2005)</td>
<td>Mobile banking companies, in my opinion, are reliable. I am certain that my transactions with mobile banking companies will be secure. My personal information would not be disclosed if I used mobile banking. In doing my banking transactions, I would find mobile banking to be secure.</td>
</tr>
<tr>
<td>Subjective norms</td>
<td>(Yang et al., 2009)</td>
<td>People who are significant to me are in favor of my using mobile banking services. People that have sway over my decisions want me to use mobile banking instead of any other option. People who I respect have recommended that I use mobile banking services.</td>
</tr>
<tr>
<td>Perceived Behavioral Control</td>
<td>(George, 2004)</td>
<td>I know how to use mobile banking. I have complete control over how I use mobile banking. I have the knowledge and competence to use mobile banking, as well as the resources (e.g., references, user’s handbook, etc.).</td>
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According to the results of the experiments, the PT has a significant favorable impact on consumer intentions. According to these findings, banks should devote their full attention to enabling new customers to be confident that the services provided are trustworthy by including a trademark, and come up with a better security proof on the mobile application and the bank’s website in order to obtain and improve service quality, resulting in the acquisition of new clients and the retaining of existing ones. Furthermore, the study found that SN had detrimental consequences on consumers’ willingness to utilize mobile banking services. This demonstrates that Palestinian customers have their own culture and are unaffected by the opinions of others. The current study also suggests that subsequent analysis may concentrate on this characteristic and disclose the elements that influence it. Because the current study’s findings are limited to the Palestinian banking sector, the study includes recommendations and advice for future researchers to continue these studies and conduct more analysis on the effect of trust on consumer’s intent in various sectors and countries in order to generalize the findings.

**Expected contribution**

The results of this study are supposed to reveal that trust in the e-channel and trust in the bank have a reverberation on mobile banking uptake. We are able to acknowledge the factors of these two variables on adoption behavior one step ahead if we separate the effects of trust from those of perceived risks. The findings of this study are anticipated to give both conceptual and factual confirmations of the distinctions connecting mobile banking adopters and non-adopters. In addition, we are capable of providing precise marketing strategy advice for practitioners to help speed up the validation of mobile banking, which will benefit bank clients.

**Conclusion and recommendations**

This study plans to analyze the elements that influence consumers’ intentions to use mobile banking in the Palestinian banking sector. To do so, the researcher employs the DTPB (ATT, PBC, SNs) and extends the DTPB by including a new determinant called perceived Trust (PT), which was derived from previous research. According to the results of the experiments, the PT has a significant favorable impact on consumer intentions. According to these findings, banks should devote their full attention to enabling new customers to be confident that the services provided are trustworthy by including a trademark, and come up with a better security proof on the mobile application and the bank's website in order to obtain and improve service quality, resulting in the acquisition of new clients and the retaining of existing ones. Furthermore, the study found that SN had detrimental consequences on consumers' willingness to utilize mobile banking services. This demonstrates that Palestinian customers have their own culture and are unaffected by the opinions of others. The current study also suggests that subsequent analysis may concentrate on this characteristic and disclose the elements that influence it. Because the current study's findings are limited to the Palestinian banking sector, the study includes recommendations and advice for future researchers to continue these studies and conduct more analysis on the effect of trust on consumer’s intent in various sectors and countries in order to generalize the findings.

**References**


Abstract

Macroeconomic convergence is critical for member states to achieve the level of harmonization required for establishing a stable and resilient monetary union. The East African Community (EAC) member states, therefore, established set targets for macroeconomic convergence, intending to eliminate exchange rate uncertainty within the bloc and reduce the costs of the monetary union. However, recent empirical studies indicate that the rate of convergence of the member states to the set macroeconomic targets has been very slow, resulting in high exchange rate uncertainty within the region. It is against this backdrop that this research was conceptualized to examine the influence of convergence in macroeconomic variables on the exchange rate uncertainty of EAC states using secondary panel data. The study made use of standard deviation and the Levin Lin Chu (LLC) test to determine convergence and unit root respectively. The panel ordinary least squares (OLS) regression findings showed that all the explanatory variables had a negatively significant effect on exchange rate uncertainty. This implies that convergence in macroeconomic variables among the member countries slows exchange rate uncertainty. Thus, policy should be made towards controlling this negative effect resulting from macroeconomic variables as East Africa bids for monetary union.

JEL classification: E44, F15, F31, F45

Keywords: macroeconomic, exchange rate, regional integration, monetary union

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**Introduction**

Many developing economies have experienced high exchange rate instability. This translates into a high degree of uncertainty for the two main monetary policy objectives that states and policymakers often seek to accomplish: price stability (low inflation) and economic growth (high output). Exchange rate uncertainties are associated with unpredictable movements in the relative prices in the general economy. Therefore, exchange rate stability is one of the main factors that stimulate high investment, control inflation and stabilize economic growth (AL Samara, 2009). Foreign exchange rate uncertainty can reverse both domestic and foreign investment decisions. It causes reallocation of resources among the sectors and countries, between exports and imports, and creates an uncertain environment for future investment.

Monetary integration is a key factor in economic growth of the integrating economies. Although it brings with it loss of sovereignty in the use of monetary policies, it leads to increase in trade and investments, output, financial deepening, and reduces intra-regional trade transactional costs (Mongeli, 2008). According to Collier (2000), there are two main justifications as to why macroeconomic convergence is needed for any successful monetary union of the blocs. First, domestic fiscal policies can cause negative spillover effects on other members of the union. Second, a moral hazard arises in a monetary union as countries become able to borrow unsustainably with the hope that other members of the union would bail them out in case of a debt crisis (Collier, 2000; Yilmazkuday, 2009).

The treaty to revive the East African Community (EAC) came into force on July 2000 with the objective of fostering a closer cooperation in political, economic, social, and cultural fields. In November 2013, the five EAC members, Burundi, Kenya, Rwanda, Tanzania, and Uganda, signed a protocol outlining their plans for launching a monetary union in 2024. To reap the maximum benefits and minimize costs of a monetary union, member countries need to achieve a sufficient degree of macro-economic convergence, and financial integration among them ahead of the monetary union. Like other regional economic communities elsewhere, EAC countries have put in place macro convergence criteria to be met by each country prior to entry into the monetary union (EAC, 2005). The critical areas of harmonization include monetary and exchange rate policy, statistic, fiscal policy coordination, financial market coordination, banking supervision and financial stability, harmonization of payments and settlement systems, and cohesive accounting and financial standards. Successful implementation of the proposed monetary union would help promote trade through the enhancement of the payment system for goods and services between the states, create a larger regional market and broaden business and trade-related income earning opportunities for the sub-region, support labor mobility, strengthen cooperation, and promote competitiveness and efficiency in production (Kibua, 2007).

The East African Community members have set benchmark criteria: sustainable economic growth, low inflation, manageable external debts, fiscal and current account deficits control (EAC, 2005; Opolot & Luvanda, 2009). They are set for three different stages with targets and divided into primary and secondary criteria in the first two stages, followed by introduction of a single currency at the last stage as shown in Table 1.

<table>
<thead>
<tr>
<th>Table 1: EAC Macroeconomic Convergence Targets</th>
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<td><strong>Primary criteria</strong></td>
</tr>
<tr>
<td>Indicator</td>
</tr>
<tr>
<td><strong>Stage 1</strong></td>
</tr>
<tr>
<td>2007-2010</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
</tr>
<tr>
<td>2011-2014</td>
</tr>
<tr>
<td><strong>Stage 3</strong></td>
</tr>
<tr>
<td>2015 onwards</td>
</tr>
<tr>
<td><strong>Primary criteria</strong></td>
</tr>
<tr>
<td>Budget deficit to GDP ratio</td>
</tr>
<tr>
<td>Excluding grants</td>
</tr>
<tr>
<td>Including grants</td>
</tr>
<tr>
<td>Inflation</td>
</tr>
<tr>
<td>Extern reserve</td>
</tr>
<tr>
<td>&lt;6%</td>
</tr>
<tr>
<td>&lt;3%</td>
</tr>
<tr>
<td>≤5%</td>
</tr>
<tr>
<td>≥4 months import cover</td>
</tr>
<tr>
<td>≤5%</td>
</tr>
<tr>
<td>≤2%</td>
</tr>
<tr>
<td>≤5%</td>
</tr>
<tr>
<td>≥6 months imports cover</td>
</tr>
<tr>
<td>monetary union</td>
</tr>
</tbody>
</table>
Meeting the above macroeconomic convergence criteria has so far been problematic for EAC states. On average, these fundamentals must move together in member countries of a monetary union if they are to reap maximum benefits from the union (Opolot & Luvanda, 2009; Zuzana & Ncube, 2012). Therefore, the situation above may pose a big challenge to the proposed monetary union for the region in terms of its cost, sustainability and stability (Zuzana & Ncube, 2012).

**Statement of the Problem**

The exchange rate within the EAC region has been highly uncertain, a situation that can make the monetary union costly, unstable and unsustainable. It was against this background that the study sought to determine the impact of convergence in key macroeconomic variables on exchange rate uncertainty within the EAC region, as the region moves into a monetary union.

**Objectives of the Study**

The objective of this research is to establish the impact of macroeconomic variables on exchange rate uncertainty.

**Theoretical literature review**

Keynesian theory was developed by John Maynard Keynes during the 1930s in an attempt to understand the Great Depression that was ravaging the globe. Keynesian macroeconomic premise focused on the effectiveness of stabilization policies (fiscal, monetary and exchange rate policies) in an open economy (Keynes, 1930). The theory focused on the effects of these policies on the key macro-aggregate variables (GDP, inflation, unemployment, balance of payments, exchange rates and interest rates). With regard to the role of exchange rate policy as an instrument for correcting current account imbalances, the debate was focused on strength and weakness of fixed and flexible exchange rate regimes (Corsetti, 2009). The international monetary system was based on fixed exchange rates, which worked well until the 1970s, when the system came under attack. According to the Keynesian observation, the globe is full of rigidities (wages and prices are rigid, labor is immobile), so that exchange rate is a powerful instrument in eliminating disequilibria. For nations that are part of a monetary union, exchange rates do not adopt to the situation of an individual economy but rather to that of the union as a whole (Gramlich, 1971).

**Empirical literature review**

From the recent empirical studies, it is clear that the benefits of monetary integration are colossal, and the EAC is moving towards establishing a monetary union within the member states. It has also been established that macroeconomic convergence, to make the exchange rate less ambiguous, is a key precondition for a monetary union (Zuzana & Ncube, 2012). The progress in macroeconomic convergence towards the set criteria needs to be assessed over time as the economies move towards the establishment of a monetary union to ensure its stability once it is established. However, from the empirical studies, there is none that has been done recently to show the progress being made in convergence in East African economies and to assess stability in exchange rates within the EAC region. It is on these arguments that this research seeks to assess the progress being made by EAC states on convergence of macroeconomic variables and its impact on exchange rate uncertainty as the regional bloc moves towards establishing a monetary union.
Research methodology

Research design

The study used quantitative research design as it seeks to determine the impact of macroeconomic variables to the set targets on exchange rate uncertainty in the EAC region over the period 2000-2016. The research design is well suited to capture trend and impact. The study covered the East African Community (EAC) region comprising of five member states: Kenya, Uganda, Tanzania, Burundi and Rwanda, which have declared interest in joining the East African Monetary Union (Opolot & Luvanda, 2009). The map of the study areas is shown in Figure 1.

Figure 1: Map of the East African Community Member States


Panel econometric analysis

This study used descriptive analysis to show the trend and relationship of study variables. Panel Ordinary Least Squares (OLS) estimation approach was adopted to model the study relationship. Hausman approach was applied to ascertain whether to employ fixed effect or random effect during analysis. This study also employed the Levin-Lin-Chu test for unit root test in order to eliminate misleading findings (Mose, 2020; Nyoni et al., 2021). The Engle-Granger approach was used to investigate whether cointegration relations exist between these variables. Standard deviation and the OLS model were used to measure convergence of macroeconomic variables and also the uncertainty of exchange rate within the region. The expectation here is that the estimation of exchange rate uncertainty should be negative.

Model specification and source of data

This study adopted the Optimum currency area theory (OCA) index, as used by Bayoumi and Eichengreen (1998), as a framework of analysis of the impact of macroeconomic variables on exchange rate uncertainty to determine the realization of a successful monetary union in the EAC:

\[ SD_{\text{r},t} = \beta_0 + \beta_1 SD_{V,t} + \beta_2 SD_{L,t} + \beta_3 SD_{S,t} + \beta_4 SD_{B,t} + \epsilon_{t} \]

where,

\( SD (r) \) – represents standard deviation of real exchange rate volatility in the EAC (Kenyan shilling was used to standardize the other currencies since it is the largest
economy in the EAC (Mackinnon, 2004). Then the US dollar, which has been stable over time, was used as a base to calculate uncertainty, and then an average was obtained. Data for this variable was obtained from the World Development Indicator report.

SD (y) – represents standard deviation of real GDP growth rate. Countries with similar real GDP growth rates will have similar demand conditions and are less likely to face different shocks, hence this reduces the significance of exchange rate policy autonomy for making necessary adjustments, and thus these states would find it easier to share a common currency. Data was obtained from Statistical abstracts and Economic surveys.

SD (i) – represents standard deviation of inflation rate. Convergence in inflation rates will change the purchasing power of currencies of potential members. Similarity in inflation rates between nations imply that they are similar in the way they conduct their economic policies, hence they are likely to face similar shocks, eliminating use of exchange adjustment as a policy tool. Data for this variable was obtained from World Economic Outlook reports.

SD (b) – represents standard deviation of the budget deficit. A convergence in the balance of budget deficit to GDP ratio is expected to reduce the exchange rate volatility in the region. The intuition behind this is because the variable attempts to capture the effect of government responsibility. Data was obtained from World Bank reports.

\( \varepsilon_t \) – is a stochastic disturbance term which is normally distributed.

In order to provide intuitive interpretation of the results obtained from this study, a number of post estimation diagnostic tests were conducted: Autocorrelation, Reset test, Heteroscedasticity and Cross-sectional dependence test.

**Result and discussion**

**Descriptive statistics results**

Table 2 presents the descriptive results for the study’s macroeconomic variables.

<table>
<thead>
<tr>
<th>Average</th>
<th>Real GDP Growth Rate (%)</th>
<th>Budget Deficit/GDP (%)</th>
<th>National Savings/GDP (%)</th>
<th>Inflation Rate (%)</th>
<th>Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>85.00</td>
<td>85.00</td>
<td>85.00</td>
<td>85.00</td>
<td>85.00</td>
</tr>
<tr>
<td>Mean</td>
<td>5.57</td>
<td>5.73</td>
<td>15.53</td>
<td>8.21</td>
<td>66.61</td>
</tr>
<tr>
<td>Std. Dev</td>
<td>1.27</td>
<td>0.75</td>
<td>2.84</td>
<td>3.80</td>
<td>8.29</td>
</tr>
<tr>
<td>Variance</td>
<td>1.60</td>
<td>0.57</td>
<td>8.06</td>
<td>14.42</td>
<td>68.70</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.42</td>
<td>-0.46</td>
<td>-0.15</td>
<td>0.72</td>
<td>0.39</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.51</td>
<td>-0.52</td>
<td>-1.11</td>
<td>1.22</td>
<td>0.23</td>
</tr>
<tr>
<td>Minimum</td>
<td>3.20</td>
<td>4.18</td>
<td>10.38</td>
<td>1.52</td>
<td>51.31</td>
</tr>
<tr>
<td>Maximum</td>
<td>7.32</td>
<td>6.84</td>
<td>19.92</td>
<td>17.62</td>
<td>83.18</td>
</tr>
</tbody>
</table>

*Source: Own calculation.*

The average of the economic growth, budget deficit, savings and inflation rates variables were 5.57, 5.72, 15.53, and 8.21 respectively for the entire study period. This can be used to compare with the set regional targets of 7, 5, 20, and 5, respectively. The findings indicate that the region is moving relatively closer to the set target in budget deficit and economic growth rate which is desirable for a monetary union. On the other hand, the countries are far from attaining the target in the other two study elements, savings and...
attributed to the worldwide financial crisis in 2008 which led to increased oil and food prices and inflation.

**Panel econometric analysis**

The panel Hausman test results are shown in Table 3 below.

<table>
<thead>
<tr>
<th>Variables</th>
<th>LLC test at level</th>
<th>LLC test First Difference</th>
<th>Order of integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate</td>
<td>-4.58***</td>
<td></td>
<td>I(0)</td>
</tr>
<tr>
<td>Inflation</td>
<td>-6.56***</td>
<td></td>
<td>I(0)</td>
</tr>
<tr>
<td>GDP</td>
<td>-6.42***</td>
<td></td>
<td>I(0)</td>
</tr>
<tr>
<td>Budget Deficit</td>
<td>-3.80</td>
<td>-7.21***</td>
<td>I(1)</td>
</tr>
<tr>
<td>Savings</td>
<td>-2.76</td>
<td>-8.55***</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

***Significance level 1%

Source: Own calculation.

The results from Table 4 show that real exchange rate, economic growth and inflation rate were all stationary while budget deficit and savings were non-stationary at 5 percent level. This implies that there is no enveloping divergence among inflation and economic growth differentials between EAC states. In other words, inflation rates and output growth in EAC countries appear to converge. The latter two variables became stationary after they were differenced, meaning that the variables are integrated to the order of one.

But from the results in Table 4, exchange rate is already stationary I (0). This implies there was no co-integration since the variables are of different integration. Estimation of the co-integrating relationship requires that all time series variables in the model be integrated to the order of one (Nyoni et al., 2021).
### Panel regression result

Results from the estimated model show that standard deviation of savings has a coefficient of -0.8 and is significant at five percent level. This means that if convergence in national savings/GDP among the EAC countries increases by 1%, then exchange rate volatility within the region is reduced by 0.8. This conforms to the existing studies that convergence in savings of countries within a region aspiring to move into a monetary union reduces exchange rate uncertainty, which makes the common currency stable and sustainable in the long-run (Kabananiye, 2011).

The findings of the estimated result show that coefficient of standard deviation of budget deficit is negative and significant. The result is consistent with those of Patroba and Nene (2013) who established that similarity in budget deficit between nations reduces exchange uncertainty within them. Budget deficit is an indicator of financial failure in which public spending exceeds available revenue. However, recently there has been a gradual improvement in the budget deficit in EAC states as they mobilize more domestic revenue, and more grants (Schulmeister, 2012).

From the results in Table 5, convergence in real GDP growth rate in the EAC region has a negatively significant effect on exchange rate uncertainty. This implies that convergence in real economic growth rates among the EAC states will reduce the exchange rate uncertainty. This can be attributed to similarity in growth rates between nations as a result of similar demand conditions and hence they are likely to face shocks in the same way (Kibua, 2007).

### Table 5: Regression Findings

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-test</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD (y)</td>
<td>-0.440</td>
<td>0.505</td>
<td>-2.870</td>
<td>0.0410</td>
</tr>
<tr>
<td>SD (s)</td>
<td>-0.818</td>
<td>0.173</td>
<td>-4.740</td>
<td>0.0000</td>
</tr>
<tr>
<td>SD (b)</td>
<td>-0.898</td>
<td>0.418</td>
<td>-2.150</td>
<td>0.0460</td>
</tr>
<tr>
<td>SD (i)</td>
<td>-0.616</td>
<td>0.273</td>
<td>-2.257</td>
<td>0.0430</td>
</tr>
<tr>
<td>Const</td>
<td>14.892</td>
<td>2.393</td>
<td>6.220</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

F (4, 12) = 10.13  Prob > F = 0.01
R-squared = 0.72  Adj R-squared = 0.7-

<table>
<thead>
<tr>
<th>Panel Diagnostics</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-Sectional Dependence</td>
<td>Breusch-Pagan LM</td>
<td>chi2 (10) = 3.79</td>
</tr>
<tr>
<td>Heteroskedasticity</td>
<td>Modified Wald</td>
<td>chi2 (5) = 1.99</td>
</tr>
<tr>
<td>Autocorrelation</td>
<td>Wooldridge</td>
<td>F (1, 4) = 12.48</td>
</tr>
<tr>
<td>Misspecification</td>
<td>Ramsey Reset</td>
<td>F = 0.11</td>
</tr>
</tbody>
</table>

Source: Own calculation.

Results from Table 5 show that inflation rate convergence has a coefficient of -0.6 and is significant at 5 percent level. This implies that as convergence in inflation rate increases by 1 percent in the EAC, then exchange rate uncertainty is reduced by 0.6 percent. Based on various panel unit root tests, the study found that inflation rates in these countries have been converging. Inflation index is the most basic and visible indicator of imbalance between demand and supply of resources in an economy (Jane & Naftaly, 2019). High and rising inflation demonstrates an imbalance in resource utilization in the economy and serves as an indicator of macroeconomic volatility (Muthui, 2016). The study finding agrees with previous studies by Nguyen and Jemma (2017) and Jane and Naftaly (2019) in EAC region and contradicts Zhang’s (2012) results.

From the results in Table 5, convergence in real GDP growth rate in the EAC region has a negatively significant effect on exchange rate uncertainty. This implies that convergence in real economic growth rates among the EAC states will reduce the exchange rate uncertainty. This can be attributed to similarity in growth rates between nations as a result of similar demand conditions and hence they are likely to face shocks in the same way (Kibua, 2007).

Results from the estimated model show that standard deviation of savings has a coefficient of -0.8 and is significant at five percent level. This means that if convergence in national savings/GDP among the EAC countries increases by 1%, then exchange rate volatility within the region is reduced by 0.8. This conforms to the existing studies that convergence in savings of countries within a region aspiring to move into a monetary union reduces exchange rate uncertainty, which makes the common currency stable and sustainable in the long-run (Kabananiye, 2011).

The findings of the estimated result show that coefficient of standard deviation of budget deficit is negative and significant. The result is consistent with those of Patroba and Nene (2013) who established that similarity in budget deficit between nations reduces exchange uncertainty within them. Budget deficit is an indicator of financial failure in which public spending exceeds available revenue. However, recently there has been a gradual improvement in the budget deficit in EAC states as they mobilize more domestic revenue, and more grants (Schulmeister, 2012).

From the regression results, the adjusted $R^2$ is 0.7 implying that 70 percent of the variations of the de-
dependent variable are explained by the explanatory variables in the model. The F static test result reveals that the null hypothesis is rejected and a conclusion made that the estimators are non zero and therefore are simultaneously significant at one percent level of significance. Further, the regression model passed all panel diagnostic tests.

**Conclusion and recommendations**

The regression results showed that all the explanatory variables had a negative and significant impact on exchange rate uncertainty. This implies that convergence in economic growth rate, budget deficit, national savings, and inflation index in EAC states is significant in reducing exchange rate uncertainty within the region, in readiness for a monetary union. The reason behind this could be that when states harmonize their economies, then they are likely to face similar shocks, hence it will not result in the need for exchange adjustments to restore balance. This helps to slow or eliminate exchange rate volatility within the region. Using a common currency renders the exchange rate adjustments ineffective as a policy tool to maintain asymmetry of shocks.

Thus, macroeconomic stability, which is a requisite for a stable and sustainable monetary union, requires sound and credible fiscal and monetary policy harmonization within the nations aspiring to have the union. These calls for cooperation between the countries and goodwill form political regimes. Central banks of these countries should be given the independence and support required to ensure financial stability and protect the value of currency. Although the results of the research show that positive progress has been made in achieving the targets of macroeconomic convergence as set out by the EAC states, measures should be put into place to ensure that targets are actually achieved and exchange rate volatility eliminated before establishing a common currency within the region.

**Areas for further research**

Comparative research can also be undertaken to compare performance between different regional economic blocs.

**References**


Abstract

The principal of neutrality is a key principle of the European Union (EU) Value Added Tax (VAT) system. The concept of tax neutrality has a number of dimensions and meanings. The purpose of the article is to examine whether the principle of neutrality shapes the main elements of VAT structure, what concepts of tax neutrality are proper to shape each of those elements, and how the principle of neutrality affects each of those elements. The method adopted for the examination is a doctrinal method – analysis of the VAT Directive provisions (using a formal-dogmatic approach supported by analysing selected judgements of the Court of Justice of the EU) but without those that concern special rules. The study showed that the basic elements of the VAT structure such as the subject of taxation, object of taxation, tax basis, tax rates, exemptions, and conditions of payment are shaped in different manner and extent by the principle of neutrality. Tax neutrality in its basic sense (marked N1) has the strongest influence on basis of taxation (improper amount of the basis disallows shifting the tax forward onto the customer and regaining output tax to relieve the taxable person entirely from the burden of the VAT) and obviously it influences the right to deduct input tax likewise in the tax period (term of refund). Tax neutrality in another sense (marked N2) by demanding equal treatment, affects such VAT elements as subject and object of taxation, exemptions and rates. Tax neutrality in the broadest sense (N3), as a term consisting of N1 and N2, concerns all the elements of VAT.

JEL classification: H20, H25, H71
Keywords: tax neutrality, elements of taxation, EU VAT system
INTRODUCTION

The value added tax (VAT) has its background in turnover taxes known already in ancient times. The serious disadvantage of such type of tax was the lack of neutrality due to multi-stage functioning – the more upstream stage in the supply chain, the higher final prices (cascading taxation). Thus, the amount of accumulated taxation increased proportionally to the number of stages. Obviously, it led to distortion of competition, especially in long trade chains. The remedy for the problem might be a tax that solely burdens value added in the current stage of turnover. This kind of taxation was introduced for the first time to an internal country tax system in France in 1954 (Charlet & Owens, 2010, p. 943) and more than a decade later - to the European Union’s law, by several directives, among which the most important were First Council Directive 67/227/EEC of 11 April 1967 on the harmonisation of legislation of Member States concerning turnover taxes and Second Council Directive 67/228/EEC of 11 April 1967 on the harmonisation of legislation of Member States concerning turnover taxes. Presently, the value added tax is mainly ruled by Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax (VAT Directive). The VAT Directive recitals indicate neutrality as a result of a common system of VAT (recital 7) and as something that should be preserved (recital 30). Therefore, tax neutrality is regarded as the principle specific for VAT (Famulski & Rogowska-Rajda, 2018, p. 88) and as the quintessence of VAT (Kondraszuk, 2016, p. 127).

The purpose of the article is to examine whether the principle of neutrality shapes the main elements of VAT structure, what concepts of tax neutrality are proper to shape each of those elements and how the principle of neutrality, interpreted by the Court of Justice of the European Union (CJEU), affects each of those elements. The method adopted for the examination is a legal (doctrinal) method - analysis of the VAT Directive provisions (using a formal-dogmatic approach supported by analysing selected judgements of CJEU) but without those provisions that concern special rules (only lex generalis not lex specialis). That approach allows us to focus on the main elements of the topic.

THE CONCEPT OF TAX NEUTRALITY AND THE PRINCIPLE OF NEUTRALITY

The concept of tax neutrality mainly has an economic dimension however it fulfils its normative equivalent. In other words, legal VAT neutrality is a consequence of neutrality in an economic sense (Gibasiewicz, 2012, p. 47). The VAT Directive, neither in its normative part nor in recitals, does not define neutrality. Nevertheless, looking through recitals and some essential articles of this act, we are able to construct a legal principal of neutrality.

The concept of tax neutrality has a number of dimensions and meanings. At least three of them should be highlighted.

The basic meaning (N1), frequently used by CJEU, concerns the right to deduct (or refund) input tax that is meant to relieve the taxable person entirely of the burden of the VAT payable or paid in the course of all his economic activity (CJEU, Rompelman case, 1985, pt 19; CJEU, I. Zimmermann case, 2012, pt 47), which prevents any aggregation of the tax. It directs that only consumption is an object of taxation.

In a broader sense (N2) tax neutrality means that supplies of goods or services which are similar, and which are accordingly in competition with each other, should not be treated differently for VAT purposes (CJEU, K. Fischer case, 1998, pt 22; CJEU, I. Zimmermann case, 2012, pt 48). In this context, neutrality preserves competition among enterprises. Looking from a subject’s point of view, it can also be noticed that taxable persons in similar situations should be treated equally, regardless of legal form of business (OECD, 2011, p. 5; CJEU, Ambulanter Pflegedienst Kügler GmbH case, 2002, pt 30). This is the transposition of the general principle of equal treatment (Famulski & Rogowska-Rajda, 2018, p. 88).

In the broadest sense (N3), tax neutrality means that taxation has no impact on taxpayers’ decisions (Stiller, 2016, p. 243; Kristoffersson, 2019, p. 21), and is economically invisible (Adamczyk & Kluzek, 2018, p. 10). Tax neutrality in this meaning consists of all the above-mentioned forms (N1 and N2). Additionally, tax is recognised as neutral when it is not avoidable by legal methods (Stiller, 2016, p. 244). The broadest meaning of tax neutrality also comprises tax convenience (compliance-friendly). In practice, such neutrality is not fully achievable in any tax system simply because of the many compliance costs and administrative obligations levied on taxpayers. For instance, according to the report Paying Taxes 2020 (PWC, 2020), complying with consumption tax obligations in Poland requires 172 hours a year (the worldwide average is 90 hours).
Elements of value added tax in the light of the principle of neutrality

Elements of a tax can be defined as units that build a tax structure. Regarded as essential are: the subject, the object of taxation, basis of taxation, tax rates, exemptions, and conditions of payment (Wolański, 2009, p. 21). All those elements are present in VAT structure. Therefore, it seems to be important to examine how the principle of neutrality shapes or affects them.

Subject of taxation – taxable persons

According to Article 9 of the VAT Directive ‘taxable person’ shall mean any person who, independently, carries out in any place any economic activity, whatever the purpose or results of that activity. Any activity of producers, traders or persons supplying services, including mining and agricultural activities and activities of the professions, shall be regarded as ‘economic activity’. The exploitation of tangible or intangible property for the purposes of obtaining income therefrom on a continuing basis shall in particular be regarded as an economic activity. Thus, subject of taxation in VAT is constructed on two strictly connected points.

The first is a personal scope which is stated in a very general and broad way (‘any person’). All persons — natural and legal, both public and private, even entities devoid of legal personality — which, in an objective manner, satisfy the criteria set out in that provision are regarded as being taxable persons for the purposes of VAT (CJEU, Gmina Wrocław case, 2015, pt 28). Excluding one of the categories from the list would pose a risk of distortion of competition between persons taxable and non-taxable, which ought to lead to infringement of tax neutrality (N2). Moreover, operators must be able to choose the form of organisation which, from the strictly commercial point of view, best suits them (CJEU, GfBk Gesellschaft für Börsenkommunikation mbH case, 2013, pt 31). Nevertheless, the VAT Directive specifies one significant exception. Due to Article 13, states, regional and local government authorities and other bodies governed by public law shall not be regarded as taxable persons in respect of the activities or transactions in which they engage as public authorities, even where they collect dues, fees, contributions or payments in connection with those activities or transactions. However, when they engage in such activities or transactions, they shall be regarded as taxable persons in respect of those activities or transactions where their treatment as non-taxable persons would lead to significant distortions of competition. The reason for this exception is, as it supposed to be, that such entities, acting in the imperium sphere, have some kind of a monopoly. Activities pursued as public authorities are those engaged in by bodies governed by public law under the special legal regime applicable to them and do not include activities pursued by them under the same legal conditions as those that apply to private economic operators (CJEU, Fazenda Pública case, 2000, pt 17). Prima facie such exception, as far as it depends on lack of significant distortion of competition, is pursuant to the principle of neutrality (N2), however all Member States have their own public law systems and may define ‘bodies governed by public law’ in different ways. That would potentially be in contravention of the principal of neutrality (N2) and requires evaluation of distortions of competition by reference to the activity in question, as such, without that evaluation relating to any particular market, and by reference not only to actual competition, but also to potential competition, provided that the possibility of a private operator entering the relevant market is real and not purely hypothetical (CJEU, National Roads Authority case, 2017, pt 41).

The second point describing subject of taxation in VAT is related to a notion of ‘any economic activity’. Article 9 presents several exemplifications of economic activity (producing, trading, supplying services, exploitation of tangible or intangible property for the purposes of obtaining income) but it does not define the notion. Thus, the most important, in the light of the principal of neutrality (N2), is to establish its strict meaning. Otherwise, supplies of goods or services which are similar, and which are accordingly in competition with each other, may be treated differently for VAT purposes. First of all, it is necessary to distinguish economic (professional, commercial) activity from private actions. A taxable person must act ‘as such’ for a transaction to be subject to VAT. A person performing a transaction in a private capacity does not act as a taxable person. A transaction performed by a taxable person in a private capacity is not, therefore, subject to VAT (CJEU, D. Armbrrecht case, 1995, pts 16-18). Secondly, the purpose or results of the business activity do not matter. It is clear from the wording of Article 9 and seems to be obvious that even unprofitable activity is competitive to the profitable. Thirdly, the concept of ‘taxable person’ is defined widely, on the basis of the
factual circumstances and the status of taxable person does not depend on any authorisation or licence granted by the authorities for the exercise of an economic activity (CJEU, G. Tóth case, 2012, pt 30). Similarly, unregistered economic activity and illegal activity or even offences should be treated as taxable, apart from such cases where any competition between a lawful economic sector and an unlawful sector is precluded (CJEU, Coffeeshop ‘Siberië’ vof case, 1999, pt 14).

All of the aforementioned factors indicate that the subject of VAT taxation should be interpreted broadly. Any narrowing of the concept of ‘taxable person’ may lead directly to infringement of the principal of neutrality (N2) due to unequal competition between persons taxable and non-taxable. We must be also reminded that the person excluded from the VAT system is automatically deprived of the right to deduct input tax (tax neutrality N1) and in consequence is treated as a consumer.

**Object of taxation – objective nature of taxable transactions**

The object of taxation in VAT is turnover that consists of supply of goods and services. Additionally, it includes certain intra-Community acquisitions and importation which actually do not make turnover. Supply of goods may take the form of domestic supply, exportation, intra-Community supply or intra-Community distance sales of goods and distance sales of goods imported from third territories or third countries.

According to Article 14.1 of the VAT Directive ‘supply of goods’ shall mean the transfer of the right to dispose of tangible property as owner. The term ‘as owner’ means that transfer a right of ownership is not necessary. A transaction may be categorised as a ‘supply of goods’ if, by that transaction, a taxable person makes a transfer of tangible property authorising the other party to hold that property de facto as if it were the owner, without the form by which a right of ownership of that property was acquired having any bearing in that regard (CJEU, ‘Evita-K’ EOOD case, 2013, pt 35). The purpose of such regulation is to eliminate differences between civil law regulations within the Member States and consequently to entail equal treatment and tax neutrality (N2).

According to Article 24.1 ‘supply of services’ shall mean any transaction which does not constitute a supply of goods. Thus, in simplified point of view, all turnover ought to be classified as supply of either goods or services. This negative definition (as well as a positive definition of ‘supply of goods’) is objective in nature and applies without regard to the purpose or results of the transactions concerned (CJEU, Lajvér Meliorációs Nonprofit Kft. case, 2016, pt 22). That causes equal treatment of services which are similar and therefore follows the principal of neutrality (N2).

**Basis of taxation – taxable amount depends on the principle of neutrality**

The basis of taxation can be defined as the object of taxation expressed quantitatively or valued, predominantly in money (Wolański, 2009, p. 22). The VAT Directive (Article 73) rules that the taxable amount shall include everything which constitutes consideration obtained or to be obtained by the supplier, in return for the supply, from the customer or a third party, including subsidies directly linked to the price of the supply. Keeping in mind that VAT is a direct tax and therefore is added onto the net price, it must be indicated that the taxable amount should allow one to regain the output tax to relieve the taxable person entirely from the burden of the VAT. In other words, the VAT should be shifted forward (as an input tax) onto a buyer. Any tearing down of this rule is contrary to the principle of neutrality (N1). It is also the reason why the VAT Directive introduces regulations providing that the taxable amount shall not include i.a. price reductions by way of discount for early payment, price discounts and rebates granted to the customer and obtained by him at the time of the supply (Article 79) and shall be reduced in the case of cancellation, refusal or total or partial non-payment, or where the price is reduced after the supply takes place (Article 90). In addition, the expression ‘consideration’ is a part of a provision of the European Union law which does not refer to the law of the Member States for the determining of its meaning and its scope. It follows that the interpretation, in general terms, of the expression may not be left to the discretion of each Member State. Such consideration is a subjective value since the basis of assessment for the provision of services is the consideration actually received and not a value assessed according to objective criteria (CJEU, Grattan plc case, 2012, pt 22). This approach not only strengthens tax neutrality (N1), but also ensures equal treatment of taxpayers across the European Union and therefore corresponds with the principle of neutrality (N2).
**Tax rates – different but neutral?**

Tax rates in the EU VAT system have not been fully harmonised and each Member State has its own rate system. The VAT Directive provides that Member States shall apply a standard rate of VAT, which shall be fixed by each Member State as a percentage of the taxable amount and which shall be the same for the supply of goods and for the supply of services (Article 96). It must be no less than 15%, but there is no maximum (Article 97). A country may apply either one or two reduced rates, but only to goods or services listed in the VAT Directive (Article 98). Such a system of tax rates would pose a risk for the principle of neutrality (N2). Level of taxation of similar goods or services may differ significantly in each State. The risk is partially reduced by the application of the destination principle (taxation in the place of consumption). For instance, the place of supply of intra-Community distance sales of goods shall be deemed to be the place where the goods are located at the time when dispatch or transport of the goods to the customer ends (Article 33 of the VAT Directive). Nevertheless, it must be admitted that there is no border control between Member States which makes it very difficult to apply the destination principle. As the OECD (2011, p. 5) has noticed, it is even more difficult to apply this principle to supply of services and intangible assets. Although the system of VAT rates does not comply with the principle of neutrality (N2), it must be borne in mind that the current provisions on VAT rates are the result of different compromises agreed upon by all the EU Countries and cannot be amended at the present time without rejecting those compromises. The EU Countries should focus on observing the principle of neutrality (N2) in their domestic law (see recital 7 of the VAT Directive and CJEU, J.K. case, 2021, pts 40-44). The exercise of the possibility granted to the Member States to apply selectively the reduced rate of VAT is subject to the twofold condition: first, that they isolate, for the purposes of the application of the reduced rate, only concrete and specific aspects of the category of supply at issue and, secondly, that they comply with the principle of fiscal neutrality. Those conditions seek to ensure that Member States make use of that possibility only under conditions which ensure the correct and straightforward application of the reduced rate chosen and the prevention of any possible evasion, avoidance or abuse (CJEU, Pro Med Logistik GmbH and E. Pongratz joined cases, 2014, pt 45).

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**Tax exemptions – do they have something in common with tax neutrality?**

Tax exemptions in the VAT system are specific. First of all, when any supply of goods or services is exempt from VAT it does not mean that it is not an object of VAT regulations and has impact on a few elements of the system such as the right to deduct. Secondly, the VAT Directive introduces two types of exemptions: exemptions without the right to deduct (this concerns most exempt transactions) and exemptions in respect of which suppliers are allowed to deduct their input VAT (used for exports of goods and also for intra-Community supplies of goods) which is technically applied by a 0% rate mechanism. The second type of exemption, applying to exports, serves to ensure tax neutrality (N3) called ‘external neutrality’ (VAT does not deform a geographical structure of a trade chain), and applying to intra-Community supplies corresponds with tax neutrality (N2) by ‘supporting’ the destination principle.

It has been stated (Piłaszewicz, 2010, p. 64) that exemptions from VAT may induce disruptions and infringe the principle of neutrality. Undoubtedly, lack of deduction of input tax impacts tax neutrality (N1) but it is possible in some cases, as long as it has compensation in potential output tax (amount of the tax that would be paid if the exemption were excluded), so that the tax neutrality (N1) will be not infringed. Furthermore, regulations introducing VAT exemptions could infringe the principle of neutrality (N2) if they were implemented or interpreted improperly. Exemptions provided for the VAT Directive constitute independent concepts of Community law whose purpose is to avoid divergences in the application of the VAT system as between one Member State and another (CJEU, Commission v. Hellenic Republic case, 2006, p. 9). The terms used to specify the exemptions are to be interpreted strictly, since they constitute exceptions to the general principle that VAT is to be levied on all goods and services supplied for consideration by a taxable person. Nevertheless, the interpretation of those terms must be consistent with the objectives pursued by those exemptions and comply with the requirements of the principle of fiscal neutrality. Thus, the requirement of strict interpretation does not mean that the terms used to specify the exemptions should be construed in such a way as to deprive the exemptions of their intended effect (CJEU, PFC Clinic AB, 2013, p. 23).
Conditions of payment – should they be shaped by the principle of neutrality?

Analysing relations between tax neutrality and conditions of payment in VAT three elements must be taken into consideration: tax period, tax calculation and terms of tax payment. All those elements, in the VAT system, should be established by Member States in domestic legislation in respect of the principles of convenience and proportionality. Otherwise, complying with obligations concerning the elements will not be in accordance with tax neutrality (N3).

Tax period is also connected with the principal of neutrality (N1) – if it is too long, the refund of the input tax is excessively deferred. For instance, a monthly tax period when the term of refund is 60 days results in 90 days of awaiting the refund (30 + 60), whereas an annual tax period and the same term of refund results in 425 days of waiting (365 + 60). Conditions of refund cannot undermine the principle of neutrality (N1) by making the taxable person bear the burden of the VAT in whole or in part. In particular, such conditions must enable the taxable person, in appropriate circumstances, to recover the entirety of the credit arising from that excess VAT. This implies that the refund is made within a reasonable period of time by a payment in liquid funds or equivalent means, and that, in any event, the method of refund adopted must not entail any financial risk for the taxable person (CJEU, A. Sosnowska case, 2008, pt 17).

From a technical point of view, we may consider as a tax calculation in VAT a difference between output tax and input tax in a tax period (usually one calendar month). That difference creates an aggregated value that corresponds in general to value added at this particular stage of turnover. The output tax depends on tax basis and tax rate. The key institution in this process is the right to deduct input tax. The purpose of the right is to relieve the taxable person entirely of the burden of the VAT. Any limitation of that infringes tax neutrality in sense N1 and - as far as it is not applied in a general way - tax neutrality in sense N2. Every limitation on the right of deduction of VAT affects the level of the tax burden and must be applied in a similar manner in all the Member States. Consequently, derogations are permitted only in the cases expressly provided for VAT Directive (CJEU, Magoora sp. z o.o. case, 2008, pt 28). The relationship between the principal of neutrality (N1) and deduction of input tax is well researched and described in literature (i.a. Militz, 2013, pp. 65-95; Gi-basiewicz, 2012, pp. 262-407; Famulska, 2015, pp. 57-64) and CJEU judgements and it is not purposive to repeat here all those accurate conclusions posted there. Only one significant idea is worth being put forward. The right to deduct input tax has become unfortunately the “Achille’s heel” of VAT (Nowak, 2016, p. 365), due to VAT frauds where the right is “used” to obtain unlawful VAT refunds. On the one hand, the taxpayer who is a “beneficial owner” of a VAT refund received by tax fraud should be deprived of all gained advantages. On the other hand, depriving one of a VAT refund or deduction is not pursuant to the principal of neutrality (N1). This dilemma is seemingly unsolvable, but two factors must be taken into consideration. Firstly, quite often there is no real input tax because there is no real transaction at the previous stage of turnover (transactions are artificial). Secondly, taxpayers who have committed tax evasion are not in a situation comparable to that of taxpayers who comply with their obligations. Accordingly, the principle of neutrality (N2) cannot legitimately be invoked by a taxable person who has intentionally participated in tax evasion (CJEU, M. Marinova ET case, 2016, pt 49). In consequence, either the principle of neutrality (N1) is not infringed or is “prevailed” by the principle of neutrality (N2).

Conclusions

The concept of tax neutrality has many, complementary meanings among which the most significant for the EU VAT systems are the right to deduct input tax (N1), equal treatment (N2) and non-influencing taxpayers’ decision (N3). All those concepts shape the basic elements of the VAT structure such as subject of taxation, object of taxation, tax basis, tax rates, exemptions, and conditions of payment. The subject of taxation is determined by the VAT Directive in a general and broad way that adheres to the principle of neutrality in sense N2. Similarly, corresponding with this principal (N2) regulations concern the object of taxation, due to their broad character. The next element of VAT structure – basis of taxation – requires, compliance with tax neutrality (N1, N2), and proper interpretation of the term ‘consideration’ as a subjective value actually received. Tax rates have not been fully harmonised within the European Union which does not support achieving fiscal neutrality (N2) even though the provisions of the VAT Directive introduce, in some areas, taxation at the place of consumption (the destination principle). Nevertheless, the principal of neutrality (N2) should be observed in domestic tax systems, especially by equal treatment of similar goods and services.
Moreover, introducing lower rates, Member States are obliged to prevent any possible evasion, avoidance or abuse, which strengthens neutrality in sense N3. In turn, VAT exemptions, excluding the right to deduct input tax, do not correspond with tax neutrality (N1). However, the terms used to specify the exemptions should be interpreted strictly and consistently with the objectives pursued by those exemptions. That allows us to follow the principle of neutrality in sense N2. The last described element of VAT structure – conditions of payment - may infringe tax neutrality (N3) on the condition it is not proportional and convenient enough for the taxpayer. Moreover, taxpayers seeking a VAT refund with any fraudulent or abusive intent can, in principle, be refused the right of deduction which does not infringe the principal of neutrality (N1, N2).

It should be clear, in the light of CJEU judgements, that there is no main element of the VAT structure that would not be shaped by one of the three, highlighted in the text, meanings of tax neutrality. Nevertheless, impact of each of them differs in various elements. Tax neutrality in sense N1 has the strongest influence on basis of taxation (improper amount of the basis disallows shifting the tax forward onto the customer and regaining the output tax to relieve the taxable person entirely from the burden of the VAT) and obviously on the right to deduct input tax likewise in the tax period (term of refund). Tax neutrality in sense N2 by demanding equal treatment, affects such VAT elements as subject and object of taxation, exemptions and rates. Tax neutrality in sense N3, as a broad term consisting of N1 and N2, concerns all the elements of VAT. Thus, as the analysis shows, the EU VAT system is built on the principle of neutrality in many areas. This conclusion should be borne in mind during both legislative and interpretive processes, especially by courts and fiscal authorities. Despite the fact that the article underlines the significance of the discussed principle, its conclusions do not exhaust the topic. Therefore, this paper should be treated as an introduction to future research. Particularly, relations between tax neutrality and special regulations or special schemes (such as margin scheme or exemption for small enterprises) might be a subject of future research.

References


Court of Justice of the European Union (2013). ‘Evita-K’ EOOD case, C-78/12, ECLI:EU:C:2013:486.


Abstract
The purpose of this paper is to highlight some issues and proffer solutions that can make sustainable finance become sustainable. One, there should be greater focus on how some aspects of finance can contribute to sustainability. Two, light-touch regulation may be needed to grow the relatively small sustainable finance sector. Three, there is a need to adopt a bottom-up approach to grow the sustainable finance sector. Four, voluntary ESG disclosures and related sustainability reporting should be encouraged. Five, short-term financial instruments can complement long-term instruments in sustainable financing.

JEL classification: Q01, G21, G28
Keywords: finance, sustainability, financial institutions, financial instruments, green finance, green bonds, light-touch regulation, bottom-up approach, sustainability reporting, sustainable development

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INTRODUCTION

The purpose of this paper is to highlight some issues and proffer solutions that can make sustainable finance become sustainable. I begin by defining the sustainable finance concept. Next, I review the literature on sustainable finance. Thereafter, I highlight the issues that might make sustainable finance become sustainable.

What is sustainable finance? The European Commission defines sustainable finance as finance that takes into account environmental, social and governance (ESG) considerations when making investment decisions in the financial sector, thereby leading to increased longer-term investment into sustainable economic activities and projects (EC, 2020).

ICMA (2020) defines sustainable finance as finance that incorporates climate, green and social finance while adding wider considerations concerning the longer-term economic sustainability of organisations and the stability of the overall financial system in which they operate. These definitions of sustainable finance have two things in common which is the emphasis on ‘long-term’ orientation and sustainable financing. Fatemi and Fooladi (2013) support this idea. They argue that the short-term orientation, which is dominant in mainstream finance, cannot lead to the creation of sustainable wealth. They propose a shift from short-term orientation towards long term orientation in sustainable finance.

Sustainable finance is becoming a big issue in the financial sector of developed countries and emerging economies. The main idea behind sustainable finance is that finance should make an appropriate contribution to sustainability. The current rally for sustainable development began with climate change mitigation and control, and transitioned to sustainable finance, and then transitioned to green finance and green bonds. Several factors have led to the move towards sustainable finance such as the need for finance to contribute to environmental sustainability (Schoenmaker, 2018); the need to generate sustainable wealth for the present and future generations (Fatemi & Fooladi, 2013), the need to make a transition towards sustainable banking (Jeucken, 2010); the need for finance to contribute to the mitigation of climate change (Ryszawska, 2016), and on-going policy support for sustainability and sustainable development (Kuhn, 2020). In this paper, I discuss some issues associated with sustainable finance, and proffer solutions that can make sustainable finance become sustainable.

The discussion in this paper contributes to the emerging literature on sustainable finance. It also offers insight on specific improvements that can be made to make the sustainable finance agenda become successful.

The rest of the paper is structured as follows. Section 2 discusses the literature. Section 3 presents the issues that need to be addressed. Section 4 suggests some solutions to make sustainable finance sustainable. Section 5 summarizes the solutions. Section 6 concludes.

LITERATURE REVIEW

Migliorelli (2021) argues that sustainable finance should be viewed as ‘finance for sustainability’ in policy and industry circles. Zioło et al., (2021) show that sustainable finance plays a fundamental role in implementing some sustainable development goals. Schoenmaker (2018) argues that the sustainable finance model brings about a shift from the narrow shareholder model to the broader stakeholder model. Ryszawska (2016) argues that a revolution in finance such as ‘suitable finance’ is needed to support the transition towards sustainable development, a green economy or a low carbon economy, and the adaptation and mitigation of climate change. Fatemi and Fooladi (2013) propose a sustainable value creation framework for sustainable finance. The proposed framework demonstrates how firms can internalize the social and environmental costs of their activities. Schoenmaker (2018) also developed a framework for sustainable finance. The framework shows that some financial institutions have started to avoid unsustainable companies, preferring to invest and lend to companies that balance financial, social and environmental goals towards the creation of long-term value for the wider community. Contreras et al., (2019) suggest that sustainable finance in the banking sector can be achieved through self-regulation. They show that banks are more likely to adopt sustainable finance principles due to peer pressure, and even without peer pressure, banks collaborating with adopters are more likely to become adopters themselves.
Some issues that need to be addressed

Not all aspects of finance can contribute to sustainability

The main idea behind sustainable finance is that finance should contribute to sustainability. This implies that all aspects of finance should contribute to sustainability. This is interesting because the term ‘finance’ encompasses all financial sector agents, financial instruments, settlement/payment systems, financial product and service offerings. This implies that all these aspects of finance should contribute to sustainability. This idea, although sound in principle, is impossible to achieve in practice. It is difficult to make all aspects of finance contribute individually to sustainability while still maintaining their individual usefulness as a tool for traditional financial intermediation. This is because the function of each aspect of finance needs to be redefined in a manner that makes it less useful for traditional financial intermediation purposes, and more useful for sustainable financing and development purposes.

Stringent regulation, particularly a stick and carrot regulatory approach, can increase the regulatory burden on financial institutions and make them exit the sustainable finance sector

Regulating the sustainable finance sector is a good idea. The important issue is the type of regulation. Many studies and reports have called for strict regulation of sustainable finance. They propose a carrot-and-stick regulatory approach where firms are rewarded for complying with ESG and other sustainability criteria and punished for failing to comply (see. Drummond & Marsden, 1995; Mendoza & Wielhouwer, 2015; Zhang, 2020; Szapiro & Pettit, 2020; Ramos Muñoz et al., 2020; Kahlenborn et al., 2017). The major issue with strict regulation of the sustainable finance sector is that the financial sector is already heavily regulated. New regulations may increase the burden on financial institutions, forcing them to choose between transferring the compliance cost to clients or choosing to exit the sustainable finance sector and to move to other areas of finance. Whichever option is chosen, it will not be in the best interest of clients in the sustainable finance industry. When financial institutions begin to exit the sustainable finance sector, the goals of the sustainable finance agenda will not be achieved.

The top-down approach to promoting sustainable finance might become its downfall

A top-down approach to promoting sustainable finance is one that requires multinational support to achieve local sustainable finance objectives. It involves creating mandatory disclosure rules, policies or standards by national governments which companies, financial institutions, investors and individuals engaged in a relevant sustainable financing activity must comply with. One merit of a top-down approach to promoting sustainable finance is that it provides oversight and policy support for activities in the sustainable finance sector.

One major issue with the top-down approach is that it introduces friction among two or more consenting economic agents engaged in sustainable financial transactions. It can increase transaction costs, thereby affecting the pricing of green financial products and services. It can also limit the extent of creativity and innovation in the sector. Also, under a top-down approach to promoting sustainable finance, a policy-induced boom in the sector is more likely to occur than a private sector-led boom. This is because private investors and financial institutions generally tend to stay away from heavily regulated financing and investment activities (particularly, risk-loving investors) as they prefer to participate in financing and investing activities that have less regulatory scrutiny or oversight. An example of this is the credit derivatives boom of 2006 in the United States. The credit derivative market was not tightly regulated, and some argued that it was loosely regulated. Many financial institutions freely participated in the market and traded in derivative instruments which led to a boom up until 2007. The credit derivatives market was subsequently regulated after the 2008 global financial crisis.

Mandatory corporate ESG reporting may become counter-sustainable

Environmental, social and governance (ESG) reporting is an important aspect of sustainable finance. Making ESG reporting a mandatory requirement for companies through regulation has the merit of ensuring that companies take responsibility for the consequence of their business decisions on the environment and society. However, one unintended consequence of mandatory ESG is that it makes companies reduce the
ESG reporting process to a mere paperwork activity especially when firm executives do not believe it contributes anything significant to corporate financing and investment activities. In this context, mandatory ESG reporting will have no value to firm executives and will not transform corporate behavior even though regulators and standard setters take ESG reporting seriously.

**Long-term sustainable finance will replace short-term liquidity with illiquid exposures, thereby making liquidity crises and government intervention more frequent**

A major feature of sustainable finance is its long-term orientation (see Fatemi & Fooladi, 2013; Schoenmaker, 2018). A long-term orientation to sustainable financing can reduce or eliminate short-term liquidity in some segments of financial markets, and lead to increase in illiquid exposures. The danger of eliminating short term liquidity in any segment of financial markets is that liquidity freeze will become more frequent, and government intervention through liquidity provision to affected segments of the market will become too frequent. There are strong concerns that the sustainable finance agenda, when fully implemented, can give rise to many illiquid exposures which may lead to a liquidity crisis at some point in financial markets, and the government has to intervene through liquidity provision to restore confidence in financial markets. The constant loop of government intervening in financial markets due to liquidity shocks suggest that sustainable financing – which emphasizes long-term orientation– is not sustainable.

**Solutions: some ways to make sustainable finance sustainable**

**Only some aspects of finance should contribute to sustainability**

One idea to address this issue is to focus only on some aspect of finance for sustainability purposes. Some aspect of finance should contribute to sustainable finance, not all aspects of finance. This is important because it creates an opportunity to focus only on some segment of the finance industry and identify ways to ensure that funds flow from those segments to sustainability activities and projects. However, if proponents of sustainable finance insist that all aspects of finance should contribute to finance, the social consequence of such an idea is that it will make the sustainable finance agenda have the resemblance of a campaign against traditional finance, or a takeover of mainstream finance, by a new group of environmental globalists. This can lead to resistance, and can negatively affect the global sustainable development agenda.

**Light-touch regulation can reduce the regulatory burden on financial institutions and encourage them to participate actively in the sustainable finance sector**

Light-touch regulation can reduce the regulatory burden of financial institutions in the sustainable finance sector, and encourage unprecedented innovation in sustainable financing. Currently, the sustainable finance sector is relatively small yet growing compared to other areas of finance. Light-touch regulation can help to grow the sustainable finance industry.

**A bottom-up approach to promoting sustainable finance is better**

If we want to witness a boom in the sustainable finance sector, we need to begin to think about a bottom-up approach to growing the sustainable finance sector. A bottom-up approach is one that allows financial sector agents to freely choose how they wish to transact business in the sustainable finance sector, how to draw up contractual agreements on a case by case basis, determine the time horizon on each trans-
**Corporate ESG Reporting Should Be Voluntary**

ESG disclosures and related sustainability reporting should be voluntary. When ESG disclosures are voluntary, companies can decide to learn about the value of ESG factors, learn about how it leads to a change in corporate behavior, understand how it can improve their profitability prospects, integrate them into their corporate strategy, and make disclosures that are more meaningful to investors and shareholders. Making sustainability disclosures voluntary is supported in the literature (see, for example, Healy & Palepu, 2001; Barman, 2018; Jiang & Fu, 2019). Healy and Palepu (2001) find that voluntary disclosures are more value-relevant to investors than mandatory disclosures especially when voluntary disclosures are credible and accurate. In sum, ESG disclosures should be a voluntary, not mandatory, requirement.

**Summary of the Suggested Solutions**

In this section, I summarise the suggested solutions to make sustainable finance sustainable:

1) Policy makers and non-governmental organizations should focus on the contribution of some aspect of finance to sustainability. Some aspect of finance should contribute to sustainable finance, not all aspects of finance.

2) Light-touch regulation can help to grow the relatively small sustainable finance sector. Strict regulations can be introduced in the future when the sector has witnessed massive growth. But strict regulations are not needed in the early stages of the development of the sustainable finance sector.

3) Adopting a bottom-up approach will grow the sustainable finance sector.

4) ESG disclosures and related sustainability reporting should be voluntary. When ESG disclosures are voluntary, such disclosures will be meaningful to firms, investors and shareholders.

5) The sustainable finance movement should accommodate the short-term orientation of investors and financial instruments. Short-term orientation can complement long-term orientation in sustainable financing.

**A Short-Term Orientation Can Complement a Long-Term Orientation in Sustainable Financing**

The sustainable finance agenda should not discourage short-term orientation among players in the sustainable finance industry. A short-term orientation in financial markets exists because the future is uncertain due to information asymmetry, changing policies, inconsistent policies, changing environmental conditions, unexpected borrower defaults, etc. These are some of the reasons why most investors and financial instruments have a short term orientation. The goals of sustainable finance can be achieved with both short-term and long term financial instruments. Short-term debt can be issued to finance environmental-damage mitigation activities designed to be completed within a few months or a year. Investors with a short-term focus may wish to invest in short-term green projects in exchange for a fair return. Also, banks may be more willing to support green firms by issuing short-term financing instruments such as commercial paper or overdrafts to fund environment-friendly activities and projects rather than issuing long-term debt instruments. Therefore, a short-term orientation should not be seen as anti-sustainability. Rather, a short-term orientation can complement a long-term orientation in sustainable financing.

**Conclusion**

In the paper, I highlighted some issues that need to be addressed and proffered solutions that can make sustainable finance become sustainable.

The suggested solutions are the following. One, there should be greater focus on how some aspect of finance can contribute to sustainability. Two, light-touch regulation may be needed to grow the relatively small sustainable finance sector. Three, there is need to adopt a bottom-up approach to grow the sustainable finance sector. Four, voluntary ESG disclosures and related sustainability reporting should be encouraged. Five, short-term financial instruments can complement long-term instruments in sustainable financing.

There is currently no one right path towards sustainable finance as long as the principles of doing less
investors and institutions. This will give rise to a need to have serious conversations and discussions about the current underlying principles of the sustainable finance agenda. These discussions should identify where adjustments can be made to ensure that the sustainable finance agenda will not become another failed development agenda just like the microfinance movement.

**References**


Abstract

What began as a single COVID-19 case in China in late 2019 quickly spread around the globe in the first quarter of 2020. While the impact on the world’s health systems is unknown, the economic toll remains also remains unknown as the world grapples with an unprecedented global recession. This paper estimates that COVID-19 will drag African economies into a fall of about 2.1% in GDP, with smaller economies facing contraction of up to 8%. The contraction is mainly a result of export adjustments affecting primary commodity exporters, and the attendant losses to tax revenue which reduce the capacity of government to extend the public services necessary to respond to the crisis.

JEL classification: A1, C1, C5, C6, C8
Keywords: Africa, COVID-19, economic, World Bank
**INTRODUCTION**

According to a World Bank report, Sub-Saharan African countries may endure their first recession in 25 years. The coronavirus, which has spread to African countries, has played a role in this, but it is also hurting Africa’s primary trading partners. The economies of the region are expected to shrink by up to 5.1 percent.

According to a World Bank report, the health, economic, and social consequences are expected to cost the Sub-Saharan African region between $37 million and $79 million in lost productivity in 2020. Agricultural productivity has dropped, weakening supply networks, worsening employment prospects, and reflecting a drop in remittances. (Mandel A., 10.04.2020).

Sub-Saharan Africa may need up to $100 bn worth of aid to boost post-pandemic economies. It should include a temporary suspension of debt repayments valued at $44 billion, says the World Bank going to the aid of African country leaders such as Ethiopian Prime Minister Abiy Ahmed, who recently argued for such a step.

The report predicts that the economies of oil and resource exporting countries such as Nigeria and Angola will be hardest affected by the pandemic. The crisis will also be severe for South Africa (Table 1). Due to a decline in agricultural productivity and a decrease in imports, the region is also facing a significant food crisis. To put it another way, several African countries may face large-scale famine once more.

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**Table 1: Consequences of COVID-19 in Africa**

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<tr>
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<th>First order effects</th>
<th>Second order effects</th>
<th>Third order effects</th>
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<tr>
<td><strong>Economical</strong></td>
<td>Decrease in GDP</td>
<td>Collapse of national supply systems</td>
<td>Recession</td>
</tr>
<tr>
<td></td>
<td>Deterioration of trade balance</td>
<td>Deterioration of economic activity</td>
<td>Debt crisis</td>
</tr>
<tr>
<td></td>
<td>Loss of jobs and livelihoods</td>
<td>Increase in informal activity</td>
<td>Financial problems</td>
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<td></td>
<td>Increased health-related expenditure</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Loss of life</td>
<td>Widespread restrictions</td>
<td>Increase in social inequality</td>
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<tr>
<td></td>
<td>Reduced social expenditure</td>
<td>Social discontent</td>
<td>Disruption of personal</td>
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<td></td>
<td>Disruption of social services</td>
<td>Collapse of social services</td>
<td>development</td>
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<tr>
<td><strong>Political</strong></td>
<td>Politicised decisions</td>
<td>Reduced trust</td>
<td>Political unrest</td>
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<td>Politicisation of law enforcement</td>
<td>Political riots</td>
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It is suggested that African countries concentrate on improving their health systems and developing social policies to protect people working in the informal economy who lack access to any form of social security.

The spread of COVID-19 in sub-Saharan Africa highlighted the weaknesses of local health systems and the limited capacity of states to take anti-crisis action on their own. In addition, it was difficult to expect material assistance from developed countries, which were themselves struggling with a shortage of equipment, resources and experience to deal with the pandemic (they provided support such as debt relief) (Gondwe, 2020).
These circumstances have compelled a rethinking of how scarce resources are used, as well as a demand for quick implementation of local, low-cost solutions. As a result, governments saw new technology, engineering, and research and development sectors as having the potential to fill shortages, reduce the risk of infection, and provide substitutes for costly imported resources.

African inventors’ primary goal is to improve the living standards of local communities, so simple solutions that make a noticeable difference predominate. The production of essential protective and medical materials using 3D printing was the first area that arose spontaneously in many places. This has provided respite in Senegal for example.

The need to avoid cash, the circulation of which promotes the spread of the virus, has given a boost to the mobile payments market. The largest coverage was in Kenya. Due to the pandemic in Ghana, Kenya, Côte d’Ivoire, Mozambique, Uganda and Zambia, the authorities required mobile payment providers to temporarily remove or reduce commissions, especially on small transactions. At the same time, the authorities simplified access to such payments, e.g., in Ghana they removed the requirement for additional registration before opening an account.

The pandemic has determined the use of e-powered cards in Sudan’s newly launched social benefits programme, which will cover 80% of families. In turn, the acceleration of the digitalisation of tax payments in the Republic of Congo increases budget revenues and transparency of public finances and will consequently make it more difficult to embezzle and export state funds abroad, among other things (The African Union, 2020).

Local companies are re-branding themselves to help water-scarce metropolises cope with increased sanitation needs. In Sierra Leone’s capital Freetown, the company Finic, formerly an agricultural machinery manufacturer, has set up a network of publicly accessible street sanitation points, while in Harare, Zimbabwe’s capital, using an app, contactless waste collection and decontamination services can be ordered (Gondwe, 2020).

IT solutions to facilitate contact tracing in the event of infection are also developing. In Kenya, an application has been developed for self-tagging by passengers on the popular minibuses there, making it easier to identify those with whom an infected person has had contact. There is also a growing market for drone transport, used to deliver medical supplies to hard-to-reach locations. In Ghana, these are run by an Australian company and have succeeded in reducing the average delivery time from 3 hours to 12 minutes. The outbreak of the pandemic has led to a rapid increase in demand for these services and for the expertise of local staff, for example in Malawi (Bartkiewicza, 2020).

Since the outbreak of the pandemic, African innovation platforms, as well as the WHO Regional Office for Africa, have held competitions and awarded funds to engineers and businesses to develop solutions to aid in the pandemic’s fight. These have aided in the mobilization of the scientific community as well as the sharing of knowledge.

Table 2: Regional and continental projects to reduce the impact of coronavirus

<table>
<thead>
<tr>
<th>Country/institution</th>
<th>Government efforts to mitigate the impact of the coronavirus on national economies</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Union</td>
<td>Consent to the establishment of a continental fund against COVID-19, which includes member states. The Bureau agreed to provide US$12.5 million in seed funding immediately. Member States, the international community and philanthropic stakeholders were persuaded to contribute to this fund and allocate US$4.5 million to increase the capacity of the African Centres for Disease Control and Prevention. Call on the international community to encourage open trade corridors, especially for pharmaceuticals and other health care resources. Call for the G20 to immediately provide African countries with medical equipment, test kits, protective gear to fight the COVID-19 pandemic and effective stimulus packages including concessions and deferred payments. It appealed to the World Bank, the International Monetary Fund, the African Development Bank and other regional institutions to use all available instruments in their arsenal to mitigate the scourge and provide relief to key sectors of African economies and communities.</td>
</tr>
</tbody>
</table>
for research and development of new technologies will encourage both the re-branding of individuals and the structural transformation of economies. Above all, it will allow for faster industrialisation and the related manufacturing of processed goods, the lack of which necessitates the purchase of more expensive completed goods, which is currently limited due to, among other things, trade with China. The launch of a low-cost coronavirus test production line by a Senegalese branch of a French institute is symbolic. The psychological impact of domestic industry investments would be bolstered by the projected completion in 2021 of one of the world’s largest refineries in Nigeria, ensuring the country’s self-sufficiency in petrol production.

<table>
<thead>
<tr>
<th>African Ministers of Finance</th>
<th>The statement, jointly signed by a number of Africa’s finance ministers, announced that the continent needs $100 billion to defend its health systems and counter the economic shock caused by the pandemic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>African Development Bank</td>
<td>ADB has raised $3 billion from a three-year bond to help mitigate the economic and social impact of the Covid-19 pandemic on African livelihoods and economies. The Fight Covid-19 social bond, with a three-year maturity, has attracted interest from central banks and official institutions, asset managers, including socially responsible investors, with bids exceeding $4.6 billion.</td>
</tr>
<tr>
<td>African Export and Import Bank</td>
<td>It announced $3 billion to help its member countries survive the economic and health impacts of Covid-19. It will provide financial support to more than 50 countries through direct financing, lines of credit, guarantees, currency swaps and other similar instruments.</td>
</tr>
<tr>
<td>Economic and Monetary Committee of Central Africa</td>
<td>Finance ministers have taken the following actions: With regard to monetary policy and the financial system, it was decided to use a pool of $152,345 million made available to the Development Bank of Central African States (BDEAC) by the Central Bank of African States (BEAC) to finance public projects to fight the Covid-19 pandemic and strengthen national health systems. They also recommended that the states collectively bargain and obtain cancellation of all their external debts to provide them with budget margins to cope simultaneously with the coronavirus pandemic and to raise savings to an appropriate level.</td>
</tr>
<tr>
<td>Central Bank of West African States</td>
<td>Increase the weekly allocation to countries’ central banks from $680 million to $9 billion to ensure continued financing of businesses in member states; Allocation of US$50 million to the West African Development Bank’s (BOAD) subsidy fund to enable it to provide an interest rate subsidy and increase the amount of soft loans it will provide to governments to finance investment and equipment spending in the fight against the pandemic.</td>
</tr>
</tbody>
</table>

*Source: UNDP Regional Stabilisation Programme for the Lake Chad Basin, COVID-19 and Stabilisation: Governance Implications for the Lake Chad Basin Region, Situational Brief, July 2020.*

**Perspectives in Africa**

The first recession in Africa in 20 years will be felt most acutely in the poorest countries, where citizens spend all of their current income on consumption and have no savings. Small-scale manufacturing, services, and trade in the area will be harmed. The development of new technologies will not be sufficient to restore growth to countries.

However, the pandemic has spurred innovation and made governments aware of the community of interest with the research sector, including universities. A collaborative model is being established, in which governments procure and guarantee the implementation of socially useful solutions, and universities develop them. In the long term, the greater favour of states for research and development of new technologies will encourage both the re-branding of individuals and the structural transformation of economies.

Above all, it will allow for faster industrialisation and the related manufacturing of processed goods, the lack of which necessitates the purchase of more expensive completed goods, which is currently limited due to, among other things, trade with China. The launch of a low-cost coronavirus test production line by a Senegalese branch of a French institute is symbolic. The psychological impact of domestic industry investments would be bolstered by the projected completion in 2021 of one of the world’s largest refineries in Nigeria, ensuring the country’s self-sufficiency in petrol production.
Conclusions

Many of the current remedies, such as those that improve city logistics and sanitation, will be supported by international entities once the pandemic is over. The importance and number of regional and worldwide programs supporting the implementation of novel solutions, such as those produced by African technical university PhD students, will grow. By developing relationships with local producers or competition committees, as well as universities interested in research collaboration, Polish enterprises can also benefit from the growing need for innovations.

References

Abstract

Road transportation is responsible for a significant part of the EU’s total CO2 emissions. Therefore, the automotive sector is subject to continuously strengthening environmental regulation. Regulation (EU) 2019/631 of the European Parliament and of the Council of 17th April 2019 sets, for the period from 2020 to 2024, an EU fleet-wide target of 147 g CO2/km for the average emissions of new light commercial vehicles and an EU fleet-wide target of 95 g CO2/km for the average emissions of new passenger cars, phasing in for 95% of vehicles in 2020 with 100% compliance in 2021. If a manufacturer does not meet given CO2 standards, the excess emissions premium (penalty) is to be charged. Value creation in the automotive sector across the supply chain is necessarily undergoing a process of change. Manufacturers of passenger cars and light commercial vehicles are forced either to face a massive penalty or to invest in the development of low-emission technology and in the change of the production portfolio towards zero- and low-emission vehicles with lower profit margins and a relatively unformed customer base. The aim of this paper is to identify how the excess emissions premium affects the value creation in the automotive industry. Our methodology utilizes the income-based valuation approach. First, we conduct an analysis of the key financial value drivers of automotive companies in the period from 2016 to 2019. Subsequently, we make a prognosis of value drivers for the future period affected by the above-mentioned regulation.

JEL classification: G32, Q51
Keywords: CO2 emissions, excess emissions premium, value drivers, company value
**Introduction**

Climate change is a serious issue that is rapidly altering the world we live in. A phenomenon known as the greenhouse effect is purported to be the main cause of climate change, which in turn results in global warming. Carbon dioxide (CO2) produced by human activity is considered the highest contributor to this environmental change (European Commission, 2014). Transport of people and goods on streets and roads is responsible for about 20% of all greenhouse gas emissions in Europe (see Daimler, 2021a and European Parliament, 2019). According to European Parliament (2021), road transportation causes three quarters of total transport CO2 emissions in the EU, with passenger cars taking the lead at 60.7%, followed by heavy duty trucks at 26.2%, light duty trucks at 11.9% and motorcycles at 1.2%.

The seriousness of climate change was recognized by the 1979 World Climate Conference, which is usually referred to as the first world climate conference. However, the first automobile emissions standards to control pollution from cars were enacted 16 years earlier in 1963 in the United States (see EPA, n.d.) and were soon followed by similar regulations in Japan, Canada, Australia, and several European countries. In June 1992, the United Nations Framework Convention on Climate Change (UNFCCC) was signed by about 150 countries at Rio de Janeiro during the United Nations Conference on Environment and Development. In December 1997, the Kyoto Protocol was adopted. The Kyoto Protocol operationalizes UNFCCC by committing industrialized countries and economies in transition to limit and reduce greenhouse gas emissions in accordance with agreed individual targets. The Paris Agreement, which replaced the Kyoto Protocol in November of 2016, recognized that climate change is a shared problem and called on all countries to set emissions targets with the goal to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. The Paris Agreement was signed by 195 parties and ratified by 191 parties (190 countries plus the European Union) representing 97% of global emissions (United Nations Climate Change, 2021). The basis of the EU’s contribution to the Paris Agreement is formed in its long-term climate strategy. In 2018, the European Commission published its communication “A clean planet for all”, which calls for net-zero greenhouse gas emissions by 2050. On 11 December 2019, the European Commission announced the European Green Deal to transform the European Union into an economy with net-zero greenhouse gas emissions (i.e. to become climate neutral) by 2050, to achieve economic growth not tied to resource use and to ensure no person and no place is left behind. The European Green Deal is also supposed to play an important role in the region’s COVID-19 recovery (European Commission, 2021a).

In order to contribute to the objectives of the Paris Agreement (considering “A clean planet for all”), the European Parliament and the Council of the European Union have adopted Regulation (EU) 2019/631, which sets CO2 emission performance standards for new passenger cars and for new light commercial vehicles and have repealed Regulations (EC) No 443/2009 and (EU) No 510/2011 (further referred to as Regulation (EU) 2019/631). According to this regulation, the emissions from conventional combustion engine vehicles will need to be further reduced after 2020 and zero- and low-emission vehicles will need to be deployed and gain significant market share by 2030.

In 2019, average CO2 emissions from all new passenger cars registered in Europe reached 122.3 g of CO2 per kilometre (EEA, 2021). CO2 emissions from new light commercial vehicles reached an EU-wide average of over 158 g of CO2 per kilometre in 2019 (Wagner, 2021). Starting 1 January 2020, the Regulation (EU) 2019/631 sets an EU fleet-wide target of 95 g CO2/km for the average emissions of new passenger cars and an EU fleet-wide target of 147 g CO2/km for the average emissions of new light commercial vehicles registered in the European Union. The CO2 emissions target of 95 g/km must be met by 95% of each manufacturer’s new passenger cars registered in 2020 and by 100% of cars from 2021 onwards. Manufacturers (except for those which have been granted a derogation under Article 10 of Regulation (EU) 2019/631) may form a pool for the purposes of meeting their specific emission targets. If a manufacturer’s average specific emissions of CO2 exceed its specific emissions target, the European Commission shall impose an excess emissions premium on that manufacturer (or the pool manager). The average value of the specific CO2 emissions is calculated as the share of total of the certified CO2 emissions of the individual vehicles, divided by the number of newly registered vehicles.
The excess emission premium shall be calculated using the following formula:

\[
\text{Excess emission premium} = (\text{Excess emissions} \times \text{EUR 95}) \times \text{number of newly registered vehicles}
\]

Excess emissions refer to the positive number of grams per kilometre by which a manufacturer’s average specific emissions of CO2, taking into account CO2 emissions reductions due to innovative technologies approved in accordance with Article 11 of the Regulation (EU) 2019/631, exceeded its specific emissions target in the calendar year or part thereof to which the obligation under Article 4 of the Regulation (EU) 2019/631 applies, rounded to the nearest three decimal places.

The amounts of the excess emissions premium shall be considered as revenue for the general budget of the European Union. The Commission should, in its 2023 review, evaluate the possibility of allocating the amounts of the excess emissions premium to a specific fund or a relevant programme that aims to ensure a just transition towards zero-emission mobility and to support re-skilling, up-skilling and other skills training of workers in the automotive sector (see L111/13, (45) Regulation (EU) 2019/631).

Manufacturers in the automotive industry are not yet meeting the aforementioned CO2 emissions criteria. Moreover, considerable difficulties are caused by a new test procedure, the Worldwide Harmonised Light Vehicles Test Procedure (‘WLTP’), that was set up in European Commission Regulation (EU) 2017/1151 in order to measure CO2 emissions from and fuel consumption of passenger cars and light commercial vehicles. WLTP provides CO2 emission and fuel consumption values that are more representative of real-world conditions (unlike the previous, less strict system called the New European Driving Cycle or NEDC).

Increased environmental regulation has placed enormous pressure on automakers. The impact of this regulation, together with other challenges (such as the self-driving evolution, connected technologies, various consequences of the COVID-19 pandemic and the global semiconductor shortage) is affecting the entire value chain within the automotive industry. The business model in this crucial sector of the European economy is changing, and manufacturers across the supply chain are forced to adopt new strategies toward sustainability or even survival. The aim of this paper is to give a brief survey of the main changes in value creation that companies in the automotive industry are undergoing.

**Methodology and Data**

Value creation is generally understood as the main financial goal of doing business. In essence, there are three groups of valuation methods, namely methods based on the analysis of business income, methods based primarily on the analysis of current prices in the market, and methods based on the valuation of individual items constituting the business. From the perspective of an income-based approach, the value of a business is given by the present value of future benefits distributable to the owners of the business enterprise. In order to determine the present value of future benefits, a capitalisation interest rate (discount rate), which corresponds to the rate of return on the comparable alternative investment, is applied.

Valuation stemming from the analysis of income can be done by applying the discounted cash flow (DCF) method based on the updating of future free cash flow (FCF) from the perspective of the valuation date (see Figure 1). Business entity is created by the long-term operational assets and net working capital (its accounting value is displayed on the left part of Figure 1). Entity value (income-based equity value plus interest-bearing external funds) is created by the present value of future free cash flow generated by all operational assets (see the right part of Figure 1). If the value is being created and not destroyed, then income-based entity value (the value resulting from financial benefits generated by all operational assets) exceeds the current value of financial surplus obtained from the liquidation of the entire business (liquidation value of assets minus liabilities).
The business valuation is based on an income-based potential as at the valuation date. Basically, the income-based potential lies in the business prospects known at the valuation date. The appraisable income-based potential contains all potential resulting from measures taken prior to the valuation date, or from sufficiently specified measures within the current business concept and generally known market information.

The financial plan for income-based valuation purposes is based on the analysis and prognosis of value drivers (Mařík et al., 2018; Copeland, Koller & Murin, 2000). In accordance with this methodology, the value drivers for the purposes of further analysis are defined as follows:

1) Sales growth,
2) Operating profit margin,
3) Investment into long-term operational assets (fixed capital investments, CAPEX),
4) Investment in operating working capital (working capital investments),

The basic scheme of the calculation of the free cash flow on the basis of the DCF method is shown below (see Mařík et al., 2018):

\[
\text{Net profit from the operation activity after taxation (NOPAT)} + \text{Depreciation and amortization} - \text{Investment into adjusted working capital required for operation (working capital investments)} - \text{Investment for providing of investment property required for operation (CAPEX)} = \text{Free cash flow for the company ("FCFF")}
\]

The calculation of the current value of FCFF determines the appraisal of the value of the entire business, including debts. By deducting the real value of interest-bearing external funds as at the valuation date, the appraisal of the value of the business equity, i.e. shareholder value is determined.

---

**Table:**

<table>
<thead>
<tr>
<th>Long-term operational assets</th>
<th>Book value of equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net working capital</td>
<td>Interest-bearing external funds</td>
</tr>
</tbody>
</table>

**Figure 1: Discounted cash flow method of calculation of company value**

Source: Authors based on Mařík et al., (2018).
5) Discount rate (cost of capital),

6) Method of financing and usage of the interest-bearing external funds (the capital structure management),

7) Duration of the business existence (time horizon).

The inter-relationship among the above-mentioned value drivers that affect the creation of shareholder value is displayed in Figure 2. Cash flow from operations increases with the increase in sales (sales growth), doing so under the condition that the operating profit margin is preserved. Efficient investments into long-term assets and working capital drain cash flow but also support sales growth, profit margin and the time horizon of the business’ existence. The boost in shareholder value is also enabled by optimizing the capital structure stemming into the reduction of the discount rate (cost of capital).

**Figure 2: Value Drivers of Shareholder Value**

![Diagram of Value Drivers of Shareholder Value]


In our research, we focus on automotive companies in Germany, Slovakia and the Czech Republic. Germany is the backbone of the European automotive industry. The revenue generated by the German automotive industry is the largest in the EU-27 region (Čižinská & Neset, 2020a). However, using the measurement of the ratio of automotive industry revenue to GDP, Slovakia moves into the top position, followed by the Czech Republic (see Čižinská & Neset, 2020a, 2020b). Therefore, we compare selected value drivers of automotive companies in these three countries. The research is based solely on external, publicly available information. We use qualitative data (reports and news) regarding the environmental activities published by the biggest German car manufacturers (BMW, Daimler and Volkswagen Group), as well as surveys, statistics and analysis by JATO Dynamics and European Automobile Manufacturers Association ACEA. We also work with non-adjusted accounting data presented in the Orbis database of European companies and other entities (published by Bureau Van Dijk / A Moody’s Analytics Company). The overall automotive industry of...
Germany, Czech Republic and Slovakia is represented by selected available accounting data from 4,989 active companies that largely operate in the following industries: manufacture of motor vehicles (NACE Rev. 2: 291), manufacture of bodies (coachwork) for motor vehicles, manufacture of trailers and semi-trailers (NACE Rev. 2:292), and manufacture of parts and accessories for motor vehicles (NACE Rev. 2:293). We use aggregate data, where selected accounting parameters (such as revenues, EBIT, total assets or equity) of individual companies (742 companies in Czechia, 3,401 companies in Germany, 846 companies in Slovakia) were summed up for each country and used as key performance indicators of the local automotive industry in each country in question.

**Discussion of the Results**

Due to strengthening environmental regulation (including Regulation (EU) 2019/631), the manufacturers of passenger cars and light commercial vehicles are forced to reduce the production of internal combustion engine (ICE) vehicles that use fuel such as diesel, gasoline, LPG and CNG and move toward electrified vehicles, such as battery electric vehicles (BEV), plug-in hybrid electric vehicles (PHEV), hybrid electric vehicles (HEV), extended range electric vehicles (EREV) and fuel cell electric vehicles (FCEV).

The first study of JATO Dynamics (2019) viewed the CO2 targets set by Regulation (EU) 2019/631 as the apocalypse for the automotive industry in Europe. If European top car manufacturers would reach 2018 results (by sales and average CO2 emissions), excluding any kind of eco-innovation credits to offset the total emissions, then the total amount of penalties in 2021 would account for almost half of their combined net profits (for example estimated excess emission premium of Volkswagen Group according to JATO Dynamics, 2019 was EUR 9.19 billion).

The year 2020 was one of the most challenging years for the European automotive industry in decades. As a direct result of the COVID-19 pandemic, car production fell below even the 2009 financial crisis levels. The number of passenger cars registered throughout the EU region contracted by 23.7% in the European Union in 2020, and registrations of commercial vehicles dropped in 2020 compared to 2019 by 18.9%, specifically vans, i.e. light commercial vehicles up to 3.5 t including buses about 17.6%, trucks about 25.7% and buses about 20.3% (European Automobile Manufacturers Association ACEA, 2021a).

Below, Table 1 presents the sales growth (value driver 1), i.e. year-to-year increase in the operating revenue reached by the German, Czech and Slovak automotive industries. Significant slowdown of European automotive production in 2018 and 2019 is apparent and was deepened by the COVID-19 pandemic in 2020 (see above).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>7.5%</td>
<td>14.3%</td>
<td>-0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>12.2%</td>
<td>2.8%</td>
<td>13.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Germany</td>
<td>14.1%</td>
<td>5.6%</td>
<td>6.7%</td>
<td>-0.6%</td>
</tr>
</tbody>
</table>

Note: Calculations based on aggregate accounting data from 742 active companies in Czech Republic, 3,401 active companies in Germany and 846 active companies in Slovakia that largely operate in the following industries: manufacture of motor vehicles (NACE Rev. 2:291), manufacture of bodies (coachwork) for motor vehicles, manufacture of trailers and semi-trailers (NACE Rev. 2:292), and manufacture of parts and accessories for motor vehicles (NACE Rev. 2:293)

Source: Authorial computations based on Orbis database.
Table 2 displays the after-tax operating profit margin, total assets turnover and indebtedness of the automotive industry in Germany, Czech Republic and Slovakia. After-tax operating profit margin (value driver 2) ranges between 2.0% and 4.8% in the period from 2016 to 2019. Initially, Germany and Czech Republic reached the highest margins with Slovakia obtaining approximately half of Czech and German results. However, within the last two years in question there was convergence of the results among all three countries to a comparable level around 3%. As a central hub of the European automotive industry, Germany is experiencing a negative trend in operating activities (declining sales and profit margins). Total assets turnover displays how efficiently the investments into long term assets and net working capital (value drivers 3 and 4) are utilized to generate sales (operating revenue). Germany has the lowest values of turnover ratios. The operations of companies in the automotive industry are particularly demanding, especially on the fixed assets. Significantly higher values of total assets turnover in the Czech Republic and Slovakia that are relatively stable (constant number of investments necessary to generate one monetary unit of sales) might be reached due to shared technologies (in both countries the largest automotive producers are companies that are part of the Volkswagen Group). Indebtedness calculated as the share of debt on capital employed (connected with value drivers 5 and 6) is slightly declining in Slovakia and relatively stable in the Czech automotive industry. Utilization of debt by the German automotive industry is three or four times higher than in other countries in question. Demanding environmental investments are covered mainly by the debt capital.
Consumer purchasing behaviour is difficult to predict. Chládková (2021) identified the apparent relationship between economic development (nominal HDP) and the demand for CO2 sensitive vehicles (BEV, PHEV) with higher prices, higher costs of ownership and demanding requirements on the infrastructure. According to the European Commission (2021b), there is strong evidence that a regulatory framework acting on the supply side is a key factor to increase the number of efficient and zero-emission vehicle models coming to the market. Chládková (2021) also identified the positive relationship between the demand for CO2 sensitive vehicles and policy instruments to promote electric vehicles adopted especially by countries with higher nominal HDP (e.g. Germany, Sweden, Netherlands etc.).

Chládková (2021) identifies two sales management strategies recently used by car manufacturers:

1) If CO2 sensitivity is a priority, then the car manufacturer sacrifices the profit margin by replacing ICE vehicles with electric ones. According to Baik et al. (2019), most manufacturers do not profit on selling electric vehicles. Apart from a few premium models, Deliveries of electric models in the EU, including the UK, Norway and Iceland, by the Volkswagen Group increased to a total of 315,400 electric vehicles (compared to 72,600 in 2019), making Volkswagen Group a clear BEV (battery-powered electric vehicles) market leader. Volkswagen Group continues to enlarge its CO2 pool even in 2021 to hedge against fines in the following years (Volkswagen Group, 2021).

Table 2: Profitability, turnover and debt ratios of the automotive industry in selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Ratio</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>After-tax operating profit margin</td>
<td>4.76%</td>
<td>4.59%</td>
<td>3.70%</td>
<td>3.67%</td>
</tr>
<tr>
<td></td>
<td>Total Assets Turnover</td>
<td>1.85</td>
<td>1.88</td>
<td>1.90</td>
<td>1.94</td>
</tr>
<tr>
<td></td>
<td>Debt / Capital Employed</td>
<td>13.50%</td>
<td>13.20%</td>
<td>16.50%</td>
<td>15.60%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>After-tax operating profit margin</td>
<td>2.41%</td>
<td>2.41%</td>
<td>1.98%</td>
<td>2.89%</td>
</tr>
<tr>
<td></td>
<td>Total Assets Turnover</td>
<td>2.45</td>
<td>2.22</td>
<td>2.36</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>Debt / Capital Employed</td>
<td>27.20%</td>
<td>24.70%</td>
<td>22.90%</td>
<td>21.00%</td>
</tr>
<tr>
<td>Germany</td>
<td>After-tax operating profit margin</td>
<td>3.80%</td>
<td>4.82%</td>
<td>4.10%</td>
<td>3.16%</td>
</tr>
<tr>
<td></td>
<td>Total Assets Turnover</td>
<td>0.72</td>
<td>0.73</td>
<td>0.68</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>Debt / Capital Employed</td>
<td>59.53%</td>
<td>57.09%</td>
<td>56.21%</td>
<td>58.49%</td>
</tr>
</tbody>
</table>

Note: Calculations based on aggregate accounting data from 742 active companies in the Czech Republic, 3,401 active companies in Germany and 846 active companies in Slovakia that largely operate in the following industries: manufacture of motor vehicles (NACE Rev. 2:291), manufacture of bodies (coachwork) for motor vehicles, manufacture of trailers and semi-trailers (NACE Rev. 2:292), and manufacture of parts and accessories for motor vehicles (NACE Rev. 2:293).

Source: Authorial computation according to Amadeus database.
they lose money on almost every electric vehicle sold. The largest negative cost factor that is causing the drop of profit from electric vehicles compared to ICE vehicles is battery costs. CO2 sensitivity strategy, on the other hand, increases the probability of meeting the criteria of Regulation (EU) 2019/631 and, therefore, leads to emission neutrality in the form of low or zero excess emission premium.

2) On the other hand, prioritizing profit maximization enables efficient utilization of infrastructure that was previously created (fixed capital and customer base). Higher volumes of ICE vehicles are being sold with higher profit margins. This scenario preserves the market share and brand awareness among customers. However, these financial benefits are offset by the excess emission premium. According to JATO Dynamics (2020), rising demand for SUVs is what is pushing car manufacturers further away from meeting emissions targets, due to their size and weight. However, SUVs are an essential part of the European automobile market and have driven sales and profitability over the past ten years. JATO Dynamics (2020) mentions two potential solutions – introduction of smaller SUVs and electrification of SUVs, which will likely discontinue some current SUVs from many brands in the short term.

Table 3 displays the profitability of different types of vehicles sold by ŠKODA AUTO a.s. and the type of sales management strategy needed if these vehicles are prioritized.

Table 3: Examples of Sales Management Strategies of Car Manufacturers in the Context of Regulation (EU) 2019/631

<table>
<thead>
<tr>
<th>Sales management strategy</th>
<th>Profit maximization</th>
<th>Transition towards CO2 sensitivity</th>
<th>CO2 sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritized vehicles</td>
<td>SUV RS (racing sport) 4x4</td>
<td>CNG vehicles Mid-sized vehicles</td>
<td>Small models PHEV BEV</td>
</tr>
<tr>
<td>Typical CO2 levels</td>
<td>&gt; 125 g</td>
<td>100 - 125 g</td>
<td>&lt; 100 g</td>
</tr>
<tr>
<td>Recent priorities</td>
<td>1) Profit margin</td>
<td>1) CO2</td>
<td>3) Profit margin</td>
</tr>
<tr>
<td></td>
<td>2) CO2</td>
<td>2) Volume</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Volume</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors according to Chládková (2021).*

Table 4 summarizes how the individual value drivers (see methodology chapter in this paper) are affected by the strategy of CO2 sensitivity versus the strategy of profit maximization and identifies the impact of Regulation (EU) 2019/631 on value creation in the automotive industry.

Table 4: The Impact of Different Sales Management Strategies in the Context of Regulation (EU) 2019/631 on Value Creation in Automotive Industry

<table>
<thead>
<tr>
<th>Value driver</th>
<th>Priority in the Management of Sales</th>
<th>CO2 sensitivity</th>
<th>Profit maximization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales growth</td>
<td>Potential increase in sales of electric vehicles depending on the policy instruments to promote electric vehicles and on the economic development of the target markets</td>
<td>Slowdown since 2018</td>
<td></td>
</tr>
</tbody>
</table>
The European automotive industry is facing decreasing profitability, increasing fixed capital intensity and indebtedness. Tightening environmental regulation will put more and more pressure on the key financial value drivers, especially the profit margins and investments into new technologies. However, currently the challenge for the automotive industry is not only how to maintain profitability while meeting EU targets and avoiding excess emissions premiums but also how to deal with the immediate and long-term impacts of the COVID-19 pandemic that is currently causing a shortage of key material inputs and will eventually affect the labour market, customer purchasing power and financial markets (capital costs).

### Table

<table>
<thead>
<tr>
<th>Operating profit margin</th>
<th>Positive effect of higher margin vehicles (e.g. SUVs); Negative effect of excess emission premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment into fixed capital and operating working capital</td>
<td>Demanding, negative short-term effect (draining cash flow); Potential to promote sales growth in the long-term time horizon; Utilization of current infrastructure, stable relation of investments to sales</td>
</tr>
<tr>
<td>Discount rate (cost of capital)</td>
<td>Negative effect of higher risk of operations (lower profit margin and higher investments stem into higher operating leverage); Positive or negative effect of financial leverage (see below); Negative effect of higher risk of excess emission premium</td>
</tr>
<tr>
<td>Method of financing and usage of the interest-bearing external funds (the capital structure management)</td>
<td>Higher investments will require additional debt financing – positive or negative effect depending on the situation at the financial markets (potential increase in the cost of debt due to the COVID-19 pandemic can have a negative impact on the discount rate); Indifferent, stable capital structure</td>
</tr>
<tr>
<td>Duration of the business existence</td>
<td>Positive effect – sustainability; Negative effect – climate change</td>
</tr>
</tbody>
</table>

Source: Authors.

### Conclusion

The speed of adaptation of the new EU targets for CO2 emissions according to Regulation (EU) 2019/631 is having a significant impact on value creation in the EU automotive industry. Internal combustion engine vehicles are sold with higher profit margins and have an already established infrastructure (fixed capital) and a relatively stable customer base. However, if ICE vehicles are being preferred excessively by a car manufacturer, these financial benefits can be more than offset by a massive penalty (the excess emission premium). Production of electrified vehicles results in lower profit margins and requires demanding investments into fixed assets as well as into creation of the customer base.

The European automotive industry is facing decreasing profitability, increasing fixed capital intensity and indebtedness. Tightening environmental regulation will put more and more pressure on the key financial value drivers, especially the profit margins and investments into new technologies. However, currently the challenge for the automotive industry is not only how to maintain profitability while meeting EU targets and avoiding excess emissions premiums but also how to deal with the immediate and long-term impacts of the COVID-19 pandemic that is currently causing a shortage of key material inputs and will eventually affect the labour market, customer purchasing power and financial markets (capital costs).
References


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