Hedging effectiveness of bitcoin on latin American equity Indices:

A multiscale analysis based on wavelets

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Abstract

Bitcoin volatility has created new dimensions for the investors Globally and attracted lot of other stakeholders to investigate various factors for its performance. This research examines the role of the Bitcoin as diversifier in the portfolio and performance as a hedger, safe-haven investment against Gold and Oil. We use a wavelet approach to capture time scale behaving of MSCI LATAM equity indices against Bitcoin and commodities under different market conditions. Our findings suggest that Bitcoin act as safe-haven device while Gold is a better hedger device against Oil which shows diversifier properties.

Keywords:Bitcoin, wavelets, hedging, cryptocurrencies, safe haven.

Introduction

Risks and returns are the integral components of the financial markets. There is evidence of accelerated growth of crypto currencies reflects the shift of the investors in both crises; recession of 2008 and COVID -19 health crisis. Returns and volatility spillovers have been widely explored in the finance literature while studies on crypto currencies has drawn a lot of attention from academicians, policy makers, government, service providers and investors. The evidence on return and shock spillovers between traditional financial market securities and crypto currencies, is evolving. According to Uzonwanne (2021), Bitcoin (BTC) is considered as inter centerpoint of attention as investment asset by the investors, international participants, regulators and media after its introduction by Nakamoto (2008). (Baur et al.,

2018b; Bouri et al., 2017b). According to (Corbet et al., 2018a, 2018b), BTC is retained the position of leader during the global uncertainty the first decentralized digital currency of the crypto currency market.

During the 2008 global financial collapse the popularity of Bitcoin was strengthened Dyhrberg (2016). After the bail out of Cyprus in 2013 more attention was paid to the Bitcoin Luther and Salter (2017) . As per the research work of Bouri et al (2017a) Bitcoin had been considered to give a protection against uncertainty surrounding conventional economic and banking systems. During the much publicized and vexed demonetization policy enforced by Indian and Venezuelan governments along the restricted movement of capital Bitcoin was

considered as an attractive option to hold cash. Previously, Gold was commonly considered to be safe-haven during financial and political uncertainties. Like wise, Bitcoin and Gold are considered to be identical assets that are used as investment assets and serve as flight to quality in times of market distress (Klein et al., 2018). Bitcoin also confines outside the politics and economics of the single country and contributes to the profitability during uncertainty and loss of faith and banking system stability. Baur et al. (2015) reported regarding the insignificant correlation between digital asset (Bitcoin) and traditional asset classes such as stocks, bonds and commodities in normal times and during periods of financial turmoil. Bitcoin role as instrument of hedge and safe haven was time varying towards in particular towards the investments of US stock market. Bouri et al. (2017a) evaluated the role of Bitcoin as a diversifier, a hedge, or a safe haven for move-ments in energy commodities and non-energy commodities. The results indicated that Bitcoin can act as an effective hedge and a safe-haven against movements in energy commodity indices, but not for non-energy commodities.

Gandal et al. (2018) analysed the Bitcoin rising and falling prices in recent years and concluded that price of Bitcoin gets a falling shock, following large investments in Bitcoin. Volatil-ity Graph of Bitcoin is similar to that of the stock market. Studies of interdependence of foreign exchange markets and cryptocurrency markets have been attracting a vast research interest from the point of view of contagion, adversely impacting portfolio risk manage-ment, strategic asset allocation, and financial instruments pricing (Baumohl, 2019; Kristjan-poller and Bouri, 2019; Malik and Umar, 2019; Celeste et al., 2020).

The outbreak of COVID-19 pandemic in early 2020 crudely affected economies around the world and had destabilizing effects on global financial markets. Cryptocurrency market, March 13, 2020 saw the largest weekly drop in the price of Bitcoin (approximately 36%). The first wave of the pandemic witnessed an unprecedented scenario where the price of a barrel of WTI crude oil turned negative in April 2020 for the first time in history. With the rise of new variant Omicron there is a sharp decline in the price of bitcoin with $38000 as on 31 January 2022.

The energy industry has been one of the indus-tries more severely affected by the pandemic because of restrictions in mobility and the blockade, producing a drastic reduction in the demand for oil and, hence, a sharp fall in oil prices because of oversupply. Ghazani and Khosravi (2020); Okorie and Lin (2020) highlighted that crude oil is one of the crucial commodity markets worldwide and serves as an underlying asset in the trading of different financial instruments in global financial markets, playing a key role in most economies. Moreover, over the last few years, it has become evident the growing significance of oil-dependent industries and the increased influence of oil price shocks on the global economy.

According to Yin et al. (2021), oil market shocks may appear as a crucial source of uncer-tainty for the cryptocurrency market, since oil price shocks might produce a risk level similar to macroeconomic news, mainly after the mid-2000s with the financialization of the oil market. In addition, some previous studies claim that changes in oil prices are significantly connected to, among others, inflation, real

output, monetary policy, changes in international interest rates, etc., so changes in oil prices may be a key factor in the cryptocurrency uncertainty.

Therefore, the study of the oil price variations may be crucial for investors, companies, and resources policy makers, among others, mainly focusing the analysis on the impact of oil price fluctuations on other financial markets, such as the cryptocurrency market. In another research work Bouri et al. (2017a) accounted for five (economic, macroeconomic, monetary policy, financial and political) uncertainty indicators. This allowed them to capture the core effects of uncertainty on the relationship Bitcoin/oil and gold/oil. These indicators permitted them to better determine the hedging and safe haven properties of Bitcoin and gold change when considering the uncertainty effects.

Guesmi et al. (2019) examined dynamic movement of Bitcoin and other financial assets through Multivariate GARCH model and concluded that Bitcoin can offer diversification and hedging benefits for investors. Bitcoin does not share many common price determinants with those financial assets (Bouoiyour et al., 2016; Kristoufek, 2015). The dependency of price of Bitcoin is due to a unique set of characteristics, such as attractiveness (Kristoufek, 2015), energy prices (Li & Wang, 2017) and less on economic and financial variables. When compared to Gold, bitcoin has better terms of acceptance, history, tangibility, intrinsic value, low volatility, and consumption. Both Bitcoin and gold have non-political attributes and are regulated as commodities, especially in the US where Bitcoin is classified as a commodity by the CFTC. No central authority can control or adjust their mining and transactions (Baur et al., 2017), which makes them both independent of inflation. Bitcoin and gold do not generate cash-flows and are instead produced in a process called "mining". Specifically, the supply of Bitcoin is limited to no > 21 million coins, as dictated by its protocol. The inverted asymmetric reaction to positive and negative news is present in both gold (Baur, 2010) and Bitcoin (Bouri et al., 2017). Uzonwanne (2021) used a multivariate VARMA AGARCH model across five major stock markets for the transmission mechanism of return spillovers and volatility spillovers.

Finally, in emerging countries, where strict regulations on capital flows exists (e.g., China), Bitcoin is used to move money out of the country. This has been accentuated by the scrutiny of the Chinese government over the gold physical market, which has made Bitcoin an ideal alternative. According to Bekiros et al., (2017) during and post Gulf Financial crisis commodities, in general, and gold have lost their appeal as safe-haven assets and behaved more like risky assets.

This study is useful for the stake holders like potential investors, financial advisors who want to have safe- haven asset. The rest of the paper proceeds as follows. Section 2 presents the methodological approach that is applied as we compare the weak and strong safe-haven abilities of Bitcoin, gold, and the Oil. Section 3 describes the dataset and section 4 discusses empirical results. Finally, section 5 includes the conclusions.

Methodology

The multiscaling approach based on wavelets performs a decomposition of the original time

series into multiple scales which each scale is associated to a different window time. The decomposition is done using special mathematical functions which basis are tracked on the Fourier analysis.

However, the wavelet analysis allows to capture high frequencies in short time frames and low frequencies in long time frames.

Fig. 1. Methodology of hedging effectiveness evaluation based on wavelets.
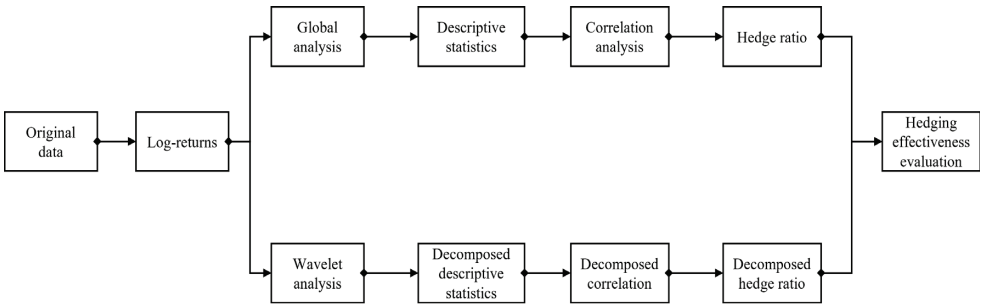
As stated above, the wavelet-based approach considers a process of decomposition into multiple frequency-time scales of a time series, so the analysis called multiresolution decomposition, where each resolution level is referred to a timescale. This approach has its basis on the Fourier series analysis which the sine-cosine functions only capture the time series frequencies. Instead, the wavelet analysis allows to decompose the time series into its frequency components at different time scales by a filtering process which is possible to separate high frequencies from low frequencies. In the first case, high frequencies mostly occur in very short time intervals, whereas the second case indicates that low frequencies may occur in long time intervals. Expression (1) represents the decomposition of a time series

$f(t)$ into its components occurring in different resolution levels:

$$f(t) = \sum_k s_{j,k}\phi_{j,k}(t) + \sum_k d_{j,k}\phi_{j,k}(t) + \sum_k d_{j-1,k}\psi_{j-1,k}(t) + \cdots + \sum_k d_{1,k}\psi_{1,k}(t), \quad (1)$$

where $\emptyset(t)$ and $\psi(t)$ are the father and mother wavelet functions, respectively. The father wavelet function allows to approximate the smooth component of the time series, meanwhile the mother wavelet function approximates the detail components. On the other hand, $S_{j,k}$ are the smooth coefficients and $d_{j,k}$

…$d_{1,k}$ are the detail coefficients, where j and k are the scaling and translation parameters, obtained from the wavelet transform. Based on Daubechies (1988), expressions (2) and (3) define the discretized form of the father and mother wavelets:

$$\phi_{j,k}(t) = 2^{-\frac{j}{2}}\phi\left(2^{-j}t - k\right), \quad (2)$$

$$\psi_{j,k}(t) = 2^{-\frac{j}{2}}\psi\left(2^{-j}t - k\right). \quad (3)$$

Then, the general decomposed form of a time series $f(t)$ may be represented in terms of its smooth (S_j) and detailed (D_j) series, as in expression (4):

The interaction analysis among time series is performed under the wavelet correlation and

$$f(t) = S_J(t) + D_J(t) + D_{J-1}(t) + \cdots + D_1(t). \quad (4)$$

coherence. The wavelet correlation is estimated by the Maximal Overlap Discrete Wavelet Transform (MODWT) which holds the main characteristic to analyze and discretize a time series $f(t)$ on a scale-based additive decomposition as shown in expression (2), with the advantage that at each scale the wavelet coefficients $s_{j,k}$ and $d_{j,k}$ have the same length as the original time series. In that context, using as mother wavelet the Least Asymmetric Daubechies function, the wavelet correlation unbiased estimator is performed as shown in expression (5):

$$\tilde{\rho}_{X,Y}(\lambda_j) = \frac{\gamma_{X,Y}(\lambda_j)}{\nu_X(\lambda_j)\nu_Y(\lambda_j)}, \quad (5)$$

Where $\gamma_{X,Y}$ is the covariance between time series X and Y at scale λ_j, ν^2_X and ν^2_Y the variances of X and Y, respectively, at scale λ_j. Finally, $\lambda_j=2^{j-1}$ stands for the timeframe at j-scale; for example, if original data comes from a daily frame, then at 1-scale it will be obtained the decomposed correlation occurring at a $\lambda_j=1$ day window, $\lambda_j=2$-day window, and successively at J-level.

On the other hand, wavelet coherence is performed under the Continuous Wavelet Transform (CWT), which based on Graps (1995) is represented as in expression (6):

$$CWT_f(j,k) = \int_{-\infty}^{\infty} f(t)\frac{1}{\sqrt{j}}\overline{\psi\left(\frac{t-k}{j}\right)}dt, j > 0, b \in \mathbb{R}, \quad (6)$$

where $\overline{\psi(t)}$ stands for the complex conjugate of the mother wavelet, while j is the scaling factor and k the translation factor. In that context, Torrence and Compo (1998) defined the

cross-wavelet transform (XWT) of two time series $X(t)$ and $Y(t)$ as in expression (7):

$$W_{X,Y} = W_X W_Y^*, \quad (7)$$

where W represents the CWT of the time series (see expression 6) and * denotes the complex conjugation. Given the XWT, Torrence and Webster (1999) define the wavelet coherence of two time series which closely matches the correlation coefficient on a local basis as follows:

$$R_n^2(s) = \frac{\left|S\left(s^{-1}W_n^{XY}(s)\right)\right|^2}{S\left(s^{-1}\left|W_n^X(s)\right|^2\right)\cdot S\left(s^{-1}\left|W_n^Y(s)\right|^2\right)}, \quad (8)$$

where S is a smoothing operator. By such means, Grinsted et al. (2004) argue that the wavelet coherence is a powerful tool to analyze linkages between two time series. In addition, Aloui and Hkiri (2014) consider its importance for detecting stock market co-movements.

The multiscale hedging effectiveness (Khalfaoui, Boutahar & Boubaker; 2015) considers the ratio at different time scales (l_j) between the unconditional covariance of the equity index-cryptocurrency/commodity asset and the unconditional variance of the equity index, as shown in expression (9):

$$\beta_{C,E}(\lambda_j) = \frac{cov_{C,E}(\lambda_j)}{\nu_C(\lambda_j)}, \quad (9)$$

where $\beta_{C,E}(\lambda_j)$ represents the hedge ratio or sensitive of the equity index against the cryptocurrency or commodity at scale time (λ_j), $cov_{C,E}(\lambda_j)$ is the covariance between the equity index and the cryptocurrency or commodity, and $\nu_C(\lambda_j)$ represents the variance of the cryptocurrency/commodity asset. A low value would show a good hedging effectiveness.

All estimations were performed in R version 4.1.1.

Data

Dataset consists of weekly prices from March 18, 2016 to December 31, 2021 of the MSCI LATAM equity indices which belong to Peru (BVL), Brasil (BVSP), Colombia (COLCAP), Chile (IGPA), Argentina (MERVAL), and Mexico (MXX); the equity indices of Dow Jones Industrial (DJI) and the Standard & Poor's 500 (SP500); commodities such as the future prices of Gold (GOLD) and West Texas Intermediate (WTI); and, the three main cryptocurrencies like Bitcoin (BTC), Ethereum (ETH) and Xripple (XRP). The range of data was restricted to the listing prices of Ethereum since 2016.

Original data was transformed to log-returns as an approximation of percentage changes, shown in expression (10):

$$\Delta P\% = ln\frac{P_1}{P_0} \times 100 \qquad (10)$$

where P_0 is the previous price and P_1 is the current price.

Equity index and commodity prices were downloaded from Refinitiv, and cryptocurrency prices were downloaded from Investing (www.investing.com).

Fig. 2 shows cryptocurrency prices behavior where the three of them registered a substantial price rise by the end of 2017. Later prices plummeted showing a negative trend where several factors explained their fall but the two most important were associated to the listing of future Bitcoins in the Chicago Mercantile Exchange and the government of China's bans to cryptos farming and trading. Almost by Q2 of 2019 a positive trend has shown the cryptocurrency market and later by the end of 2020 prices soared during the pandemic era when most countries entered to a recession period because of Covid-19. Besides crypto prices collapsed by mid of 2021, a second rally haven shown since then surpassing the maximum levels reached by the end of 2020 (See appendix A for whole time series prices).

Fig. 2. Main cryptocurrency prices.

Table 1 shows descriptive statistics of log-return prices where cryptocurrencies have shown a better return performance. However as measured by the standard deviation, cryptocurrencies show higher volatility against equity indices and commodities. The most volatile cryptocurrency is recorded by Xripple but it has shown more frequent positive weekly returns than negative ones. Besides cryptocurrencies are showing in the period of study a higher volatility but COLCAP, DJI and SP500 are showing the most extreme values against cryptocurrencies as measured by kurtosis. Also, it is observed that Bitcoin and Ethereum are showing the lesser kurtosis values. In that sense, cryptocurrencies could not be considered as fat-tailed financial assets when compared to traditional assets. So, besides high volatility of cryptocurrencies but these alternative assets are not showing extreme movements as registered by traditional financial assets.

The level of interconnectedness among traditional financial assets and cryptocurrencies is shown in Fig. 4. It is observed that the global association as measured by the coefficient correlation registers the low degree of

interaction of cryptocurrencies against equity index and commodity returns. Even the Bitcoin case shows a less level of co-movement when compared to the gold case. Also, it is observed that oil shows a low degree of association with LATAM equities but higher than cryptocurrencies. The interaction level of oil and the crypto assets also shows a low correlation.

Fig. 4. Global correlation.

Based on the descriptive statistical results, this article is motivated to analyze the possibility of cryptocurrencies to be considered as safe-haven assets or to serve as hedging devices. Cryptocurrencies' high volatility but a low kurtosis and low levels of association against equity indices and commodities may indicate new challenges in the FINTECH industry and regulatory purposes.

Results analysis

This section is divided into 2 subsections. The first one shows the wavelet coherence heat maps based on expression (8) and section two shows hedge ratios estimations on the global and multiresolution decomposition (MRD) approach.

Fig. 5 shows the wavelet coherence of Bitcoin against MSCI LATAM and USA equity indices, and commodities (see Appendix B for whole coherence heatmaps). It is observed that Bitcoin has kept a low degree of association along time scales and across time. However, some episodes of high interconnectedness are registered but which time of occurrence is rapid and furious. Other cases show that in the long run where scales belong to window times

Table 1. Descriptive statistics of original log-return values.

Variable/ Statistic	Mean	Standard Deviation	Minimum	Maximum	Skew	Kurtosis
BVL	0.19%	2.70%	-13.68%	11.61%	-0.5812	6.0659
BVSP	0.24%	3.25%	-20.92%	11.08%	-1.4200	7.9226
COLCAP	0.02%	3.15%	-24.67%	22.14%	-1.9141	30.5677
IGPA	0.03%	2.81%	-19.19%	12.03%	-1.1175	9.6010
MERVAL	0.62%	5.56%	-37.76%	17.66%	-1.3438	7.8620
MXX	0.05%	2.17%	-10.56%	7.53%	-0.3427	3.0840
DJI	0.24%	2.60%	-19.00%	12.08%	-1.5582	14.6862
SP500	0.28%	2.40%	-16.23%	11.42%	-1.3956	11.7509
GOLD	0.11%	1.96%	-9.90%	10.10%	-0.2210	4.6377
WTI	0.21%	5.98%	-34.69%	27.58%	-0.7930	7.0115
BTC	1.58%	11.25%	-53.94%	36.20%	-0.3698	2.1797
ETH	1.95%	15.06%	-65.97%	49.89%	-0.1257	1.8723
XRP	1.55%	19.67%	-67.15%	114.54%	1.6472	7.2135

Note: 302 weekly observations.
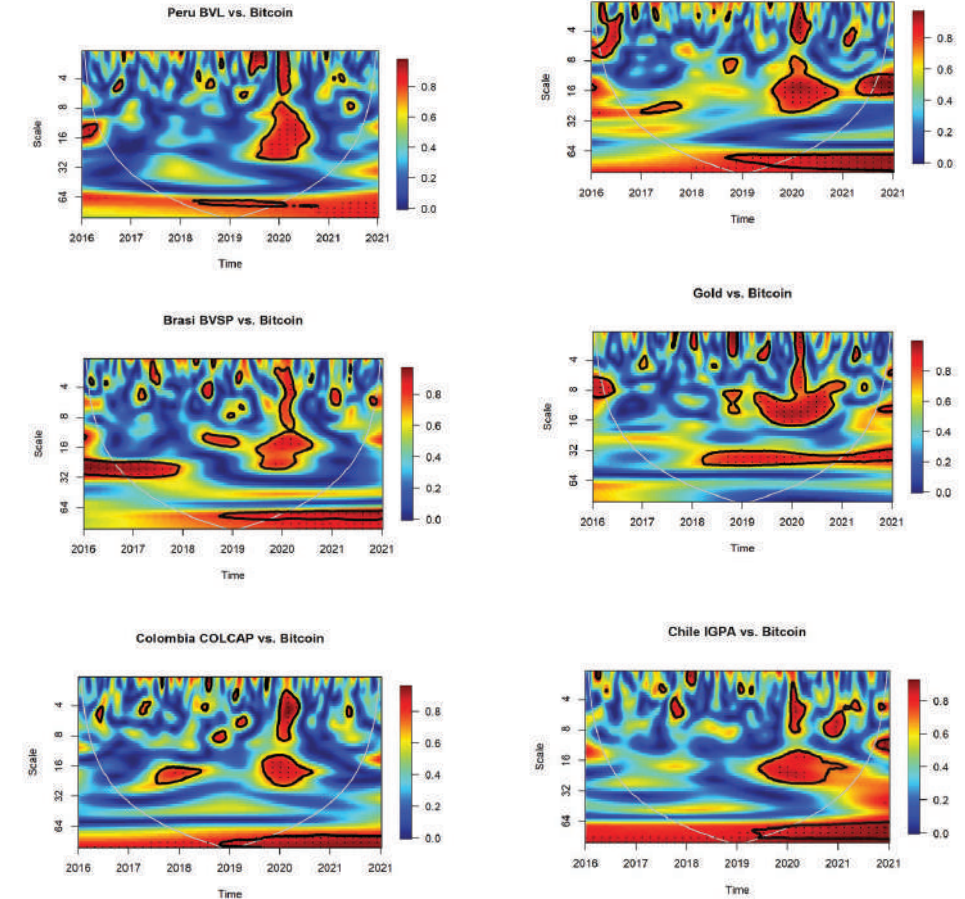
Source: authors estimations.
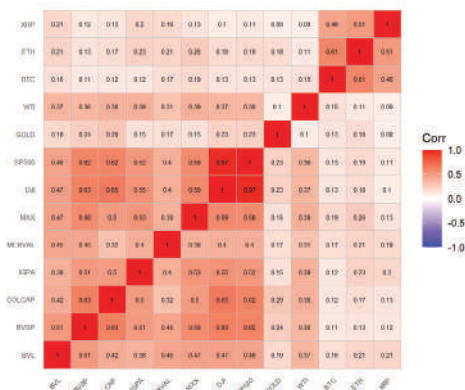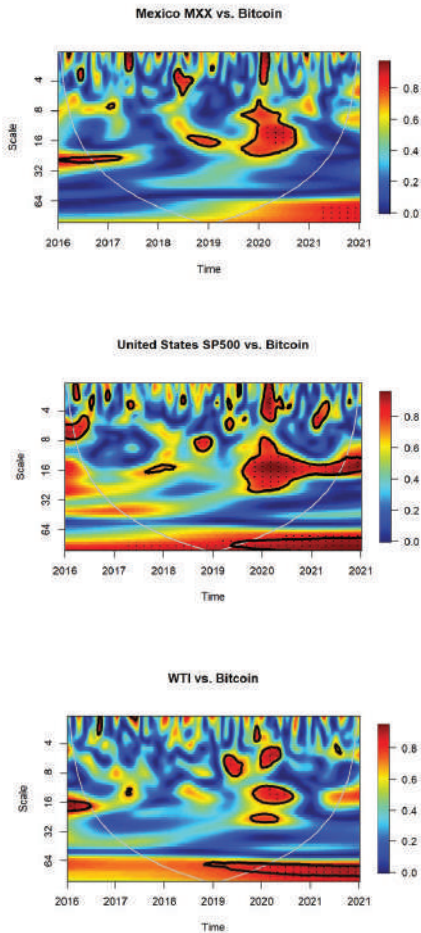

Source. Authors estimations.

greater than 64 weeks, the the level of association remains high which is characterized as fundamental linkages. Even though that in most of the time the degree of interaction is low, but during the pandemic era because of Covid-19 it was registered a high level of association which lasted more than 16 weeks and has passed through from 2020 to 2021.

A specific example is the Bitcoin-MXX pairwise where the degree of association was higher during the Covid-19 era than in the end of 2017 when cryptocurrencies crashed. Besides it would be considered a greater interaction of Bitcoin and the USA equity indices, but the crypto crash in 2017 was fast and furious that didn't pass through to 2018.The most interaction level has been found when the Covid-19 era. It is observed that in the long run when time spans over 64 weeks, the

association records high levels which is considered by fundamental linkages that could be explained by linkages of technology-based companies with the stock markets which are developing blockchain technology. Also, since the Covid-19 era crypto-investors have relied more their investment decisions on monetary policy stances.

Fig. 5. Wavelet coherence of Bitcoin among the MSCI LATAM and USA equity indices, and commodities.

Argentina MERVAL vs. Bitcoin

Peru BVL vs. Bitcoin

United States DJI vs. Bitcoin

Brasi BVSP vs. Bitcoin

Gold vs. Bitcoin

Colombia COLCAP vs. Bitcoin

Chile IGPA vs. Bitcoin

Mexico MXX vs. Bitcoin

United States SP500 vs. Bitcoin

WTI vs. Bitcoin

Source: Authors estimations.

Descriptive statistics estimated based on the MRD shows that volatility decreases as time scale increases where *D1* resembles original log-return prices when the window time runs between 1 and 2 weeks. However, in a medium term at scale *D2* when the time frame spans from 8 to 16 weeks it is observed a decrease in the volatility of all assets.

This happens since wavelets act as filtering functions in the MRD process where they denoise the original values as time scales increase. At high resolution levels, D7, when time spans from 64 to 128 weeks, it is recorded a dramatically change in kurtosis. So, even when equity indices that have shown extreme values now the probability to observe fat-tailed distributions in the long run reduces. In that sense as volatility and kurtosis diminish from the short to the long run, how do interconnectedness behave among assets?
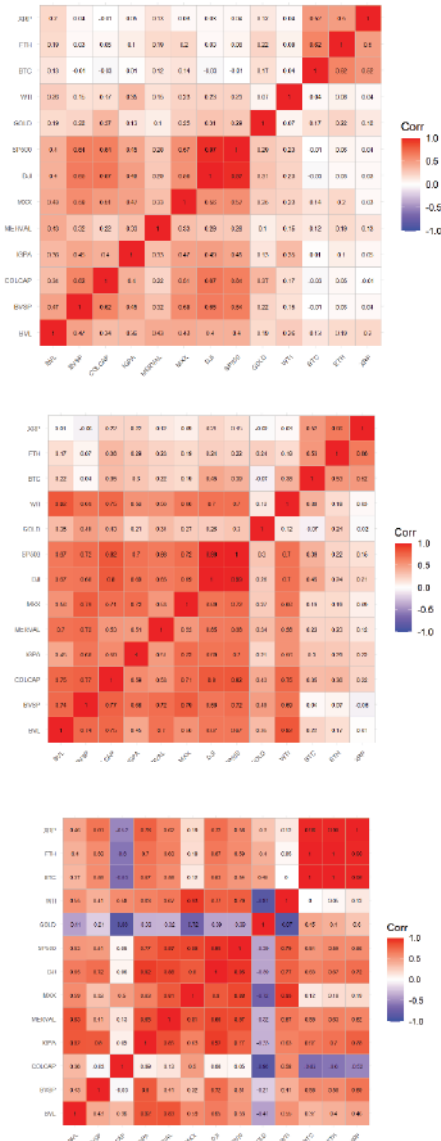
The decomposed correlation at D1, D4 and D7 scales are shown in fig. 7 where the degree of association increases from the short to the long run. This means that at low scales during time which spans from 1 to 2 weeks when high frequencies occur, the level of association of cryptocurrencies against equity indices and commodities still resembles a low degree of interaction. However, as time spans increases from 8 to 16 weeks, the degree of comovement increases in most of the cases and in a wide sense. Nevertheless, in other cases the association inverted from positive to negative. For example, Bitcoin and gold showed initially a positive relationship in the short run but in the medium run at D4 scale it happens a negative level of association.

When time spans from medium to long term at D7 scale, the degree of association even increases in most of the cases. The Bitcoin-gold case has turned now from a negative to positive relationship. However, now COLCAP against the three cryptocurrencies has shown a negative behavior. Also, it is important to observe that gold has shown a positive to negative behavior from low to high scales.

Table 2. Decomposed (MRD) descriptive statistics based on D1, D4, and D7 scales.

Variable/ Statistic	Scale	Mean	Standard Deviation	Minimum	Maximum	Skew	Kurtosis
BVL	D1	0.00%	1.6815%	-6.6669%	7.66%	0.0745	4.0267
	D4	-1.02E-19	0.6484%	-2.5691%	2.0100%	-0.3371	2.8443
	D7	3.0255E-20	0.0710%	-0.1389%	0.0805%	-0.7407	-0.8886
BVSP	D1	0.00%	2.1288%	-9.9286%	12.07%	0.1246	4.9324
	D4	1.47E-20	0.9185%	-3.5458%	2.8038%	-0.2563	2.3660
	D7	1.1241E-20	0.0609%	-0.1128%	0.0916%	-0.2987	-1.2109
COLCAP	D1	0.00%	2.0019%	-11.4109%	18.75%	1.7956	30.9461
	D4	2.15E-20	0.5839%	-2.3066%	1.6013%	-0.3084	2.4621
	D7	-5.358E-21	0.0971%	-0.2084%	0.1488%	-0.5659	-0.4755
IGPA	D1	0.00%	1.7531%	-7.6157%	7.27%	-0.0819	3.9495
	D4	-7.85E-20	0.5531%	-2.0378%	1.4989%	-0.3123	1.5395
	D7	-2.238E-21	0.1138%	-0.1961%	0.1795%	-0.1300	-1.1616
MERVAL	D1	0.00%	3.4795%	-15.9984%	14.29%	0.0453	2.5422
	D4	-2.20E-19	1.3982%	-4.7410%	3.8482%	-0.3043	1.6674
	D7	2.9249E-20	0.1044%	-0.1938%	0.1429%	-0.4988	-1.0129
MXX	D1	0.00%	1.4098%	-4.5037%	4.96%	0.0945	0.7728
	D4	-3.19E-21	0.5116%	-1.9696%	1.6173%	-0.1987	2.2738
	D7	7.9738E-21	0.0980%	-0.1575%	0.2015%	0.4552	-0.4855
DJI	D1	0.00%	1.8689%	-9.9070%	12.80%	0.3764	12.8542
	D4	-4.97E-20	0.4798%	-2.1553%	1.6485%	-0.4887	4.9909
	D7	-2.879E-20	0.0807%	-0.1277%	0.1308%	0.0010	-1.3538
SP500	D1	0.00%	1.7143%	-8.3314%	10.60%	0.2384	8.8946
	D4	-1.13E-20	0.4455%	-2.0537%	1.5247%	-0.5693	5.4861
	D7	-9.297E-21	0.0713%	-0.1053%	0.1363%	0.3120	-0.9905
GOLD	D1	0.00%	1.3957%	-5.8267%	8.05%	0.2266	6.0544
	D4	1.14E-20	0.3143%	-0.7071%	0.7868%	0.1514	-0.6990
	D7	-1.67E-20	0.1157%	-0.1608%	0.2139%	0.2352	-1.1647
WTI	D1	0.00%	3.2624%	-13.8861%	19.53%	0.3642	4.9901
	D4	-7.73E-20	1.7056%	-7.2108%	6.9405%	-0.0678	5.3314
	D7	4.6074E-20	0.3719%	-0.6348%	0.6247%	-0.0379	-1.1903
BTC	D1	0.00%	7.5534%	-33.1381%	27.72%	0.0003	2.6342
	D4	2.36E-19	2.1001%	-5.9436%	6.3926%	-0.0257	0.1944
	D7	1.2546E-19	0.9533%	-1.4936%	1.6310%	0.0505	-1.3172
ETH	D1	0.00%	9.4201%	-37.8546%	30.32%	-0.0671	1.0440
	D4	4.29E-19	2.7708%	-9.4910%	8.4514%	-0.0860	0.8660
	D7	-4.135E-19	1.7960%	-2.8619%	2.9781%	0.0054	-1.3406
XRP	D1	0.00%	11.4963%	-45.4927%	51.91%	0.3635	3.7317
	D4	5.47E-19	5.0488%	-14.0547%	16.5796%	0.2498	1.4437
	D7	-2.585E-19	1.7802%	-2.5326%	3.2466%	0.1988	-1.2156

Fig. 7. Decomposed correlation at D1, D4 and D7 scale levels.

Source: Authors estimations.

The decomposed correlation supports the wavelet coherence analysis where in most of the cases when the scale increases or when the window time spans from short to long run within a year and across years, the level of interaction shows a low degree of connectedness. The Bitcoin case shows a different pattern when competing with Ethereum and Xripple, while these altcoins show a low degree of association at high scales the Bitcoin records high levels of interaction in those scales.

Even when Bitcoin shows rapid and furious comovements at low scales which dissipate almost immediately, but at high scales spanning over 64 weeks the level of interaction increases.

In the standpoint of the theoretical comovements view this behavior is explained because of fundamental linkages. The exception is observed in the Bitcoin-gold pairwise where over 64 weeks and across time the interaction is negative. So, the change of degree of association is supported by the wavelet coherence. Finally, even though changes along scales and across time, all cryptocurrencies against equity indices and commodities showed a contagion phenomenon during the Covid-19 pandemic era[1].

Based on the wavelet coherence and decomposed correlation, what could be expected on cryptocurrencies to be considered as hedger, diversifier, or safe-haven devices? This question is answered by estimating the hedge ratio of equity indices against cryptocurrencies.

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[1]When comovement shows a strong level of interaction but dissipates almost immediately it is known as contagion. On the other hand, when the level of interaction maintains in the long run it is known as a fundamental linkage (Gallegati, 2012).

independent. Since gold and oil have been considered as safe-haven assets when occurring high uncertainty periods or financial crises, then the analysis is based on a competition framework of cryptocurrencies against commodities.

Table. 3a and 3b shows the hedge ratio estimations of equity indices against Bitcoin and commodities. It is observed that in most of the cases Bitcoin and WTI indicate diversifying properties when time spans from short to long run, while gold is showing hedging capabilities as the ratio decreases and turns from positive to negative side when time spans from short to long run (from D1 to D7 scale). A specific case is that of the Mexican equity index (MXX) where ratio values against Bitcoin are relatively low and almost non statistically significant.

When compared to MXX against gold, ratio values decrease and change from positive to negative as time spans from short to long run which show high statistical significance.

The pairwise WTI-MXX show increasing ratio values as also the statistical significance. In that sense, Bitcoin may act as a safe-haven device, gold as hedging device, and oil as a diversifier device, when time spans from short to long run.

It is important to note that besides gold may hold safe-haven properties in the long run but in the short run it is acting better as a diversifier device. It is aligned with findings that are Baur and McDermott (2010) when examined the role of gold and identified it as a safe haven against

Cryptocurrency/ Commodity	Equity Index	Scale	Hedge Ratio	t-value
Bitcoin	BVL	Global	0.6834	2.8800
		D1	0.5630	2.1880
		D4	0.7100	3.8910
		D7	5.0020	6.9560
	BVSP	Global	0.3881	1.9530
		D1	-0.0453	-0.2210
		D4	0.1005	0.7620
		D7	9.0110	12.1800
	COLCAP	Global	0.4438	2.1700
		D1	-0.1100	-0.5050
		D4	1.2690	6.5280
		D7	-6.1450	-13.9000
	IGPA	Global	0.4924	2.1500
		D1	0.0328	0.1320
		D4	1.1220	5.3590
		D7	5.6480	15.8100
	MERVAL	Global	0.3363	2.9200
		D1	0.2623	2.1080
		D4	0.3375	3.9940
		D7	5.3250	12.4300
	MXX	Global	0.9681	3.2930
		D1	0.7372	2.4060
		D4	0.7736	3.3240
		D7	1.1880	2.1320
	DJI	Global	0.5787	2.3370
		D1	-0.1076	-0.4610
		D4	1.9810	8.7930
		D7	7.4550	14.1000
	SP500	Global	0.6152	2.2910
		D1	-0.0392	-0.1540
		D4	1.8330	7.3120
		D7	7.1670	10.9900

Cryptocurrency/ Commodity	Equity Index	Scale	Hedge Ratio	t-value
Gold	BVL	Global	0.1406	3.4300
		D1	0.1550	3.2940
		D4	0.1719	6.5670
		D7	-0.6706	-7.8250
	BVSP	Global	0.1473	4.3670
		D1	0.1433	3.8800
		D4	0.1661	9.6150
		D7	-0.3987	-3.7160
	COLCAP	Global	0.1807	5.2680
		D1	0.2595	6.9460
		D4	0.2308	8.2180
		D7	-1.0290	-29.6600
	IGPA	Global	0.1016	2.5590
		D1	0.1056	2.3190
		D4	0.1218	3.8000
		D7	-3.3200	-5.9830
	MERVAL	Global	0.0613	3.0640
		D1	0.0406	1.7640
		D4	0.0760	6.2230
		D7	-0.3517	-5.7940
	MXX	Global	0.1312	2.5470
		D1	0.2429	4.3830
		D4	0.1651	4.8320
		D7	-0.8523	-18.0700
	DJI	Global	0.1715	4.0500
		D1	0.2315	5.6480
		D4	0.1728	4.7370
		D7	-0.5603	-7.3570
	SP500	Global	0.1892	4.1290
		D1	0.2401	5.3450
		D4	0.2128	5.4800
		D7	-0.6351	-7.3630

stock in major emerging and developing countries Also, as the hedge ratio of the Mexican equity index against Oil strengthens and increases its statistical significance when time spans from short to long run, then Oil would act as a better safe-haven device in the very short run but a diversifier device in the long run. Nonetheless, since hedge ratios of MXX-gold are lesser than MXX-WTI and high statistical significance then gold could be considered as a better hedger device than oil at any window time.

If the ratio is significantly negative, then cryptocurrencies may have hedging capabilities. On the other side when the ratio is significantly positive then cryptocurrencies are acting well as diversifier devices. However, safe-haven properties are indicated when the ratio is significantly.

Table. 3.a. Hedge ratio estimations of equity indices against Bitcoin and gold.

Cryptocurrency/ Commodity	Equity Index	Scale	Hedge Ratio	t-value
WTI	BVL	Global	0.8149	6.8660
		D1	0.5101	4.7200
		D4	2.1640	25.0000
		D7	2.8560	11.2700
	BVSP	Global	0.6554	6.6010
		D1	0.2352	2.6900
		D4	1.2820	16.5200
		D7	2.5080	7.7950
	COLCAP	Global	0.7182	7.0830
		D1	0.2707	2.9180
		D4	2.2010	19.8600
		D7	2.2270	12.3800
	IGPA	Global	0.8318	7.3710
		D1	0.6516	6.4740
		D4	1.7130	11.5700
		D7	2.0590	14.0500
	MERVAL	Global	0.3288	5.5620
		D1	0.1446	2.7030
		D4	6.8400	11.7300
		D7	2.3870	15.6200
	MXX	Global	1.0860	7.4320
		D1	0.5394	4.1520
		D4	2.2040	15.2700
		D7	3.5380	44.6000
	DJI	Global	0.8429	6.8200
		D1	0.3987	4.0630
		D4	2.4860	16.9500
		D7	3.5440	20.8400
	SP500	Global	0.8919	6.6370
		D1	0.4432	4.1480
		D4	4.1280	22.3900
		D7	4.1280	22.3900

Conclusion

This article has performed a multiscale analysis approach of Bitcoin and two main altcoins against MSCI LATAM equity indices and commodities, in such a way to identify if Bitcoin may serve as a safe-haven, hedge or diversifier device. The analysis was performed under the wavelet approach which allows to decompose the original time series into multiple time scales where high frequencies are captured in low scales and low frequencies can be captured in high scales. In that sense, besides the possibility to identify the type of comovement among time series, the main issue in this research was to estimate the hedge ratio. If the hedge ratio is negative and statistically significant then the asset could be considered as a hedger device. On the other hand, if the ratio is high and statistically positive then the asset would be hold diversifier properties. A safe-haven asset would mean when comovements are independent.

Results show that in most of the cases Bitcoin against commodities is a better safe-haven device when time spans from short to long run. An exception is found in the pair wises Bitcoin-DJI and Bitcoin-SP500 where after acting as a safe-haven device in the short run it evolves as a diversifier device. When Bitcoin competes against Gold, this commodity holds better hedging properties when time spans from short to long run. Finally, since Oil showed high hedge ratios and statistically positive then this commodity has been acting better as diversifier.

Not only the research results are important for investment portfolios but for FINTECH based companies which are seeking to offer financial services to unbanked people where cryptocurrencies could be a next wealth store asset and a

wide acceptable medium of exchange for commercial purposes. However, more research is needed to establish better game rules between the crypto-market and the banking sector.

Acknowledgement

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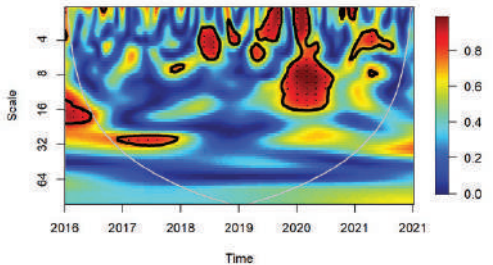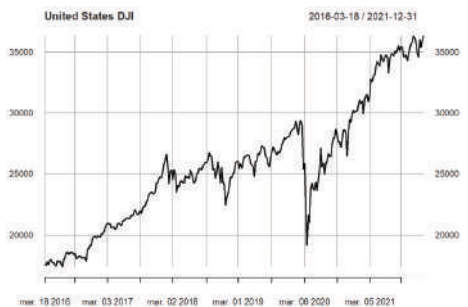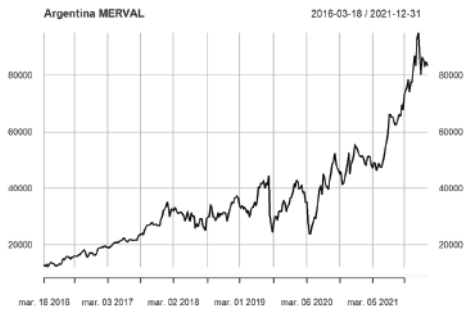
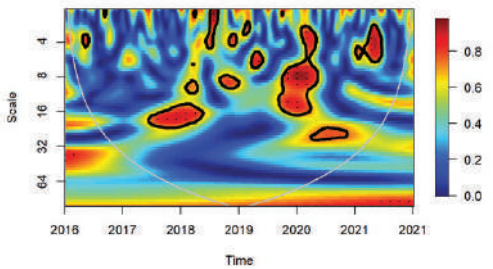Appendix A. Equity and commodity prices.

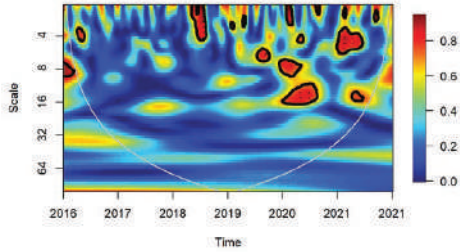Appendix B. Wavelet Coherences..

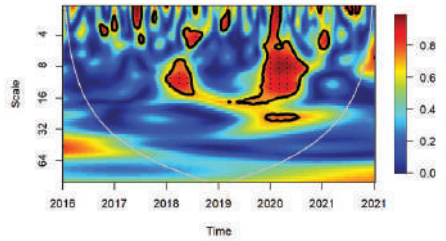B.1. Ethereum

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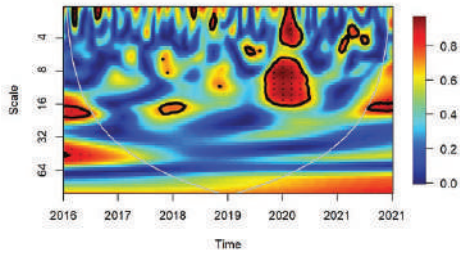

Colombia COLCAP vs. Ethereum
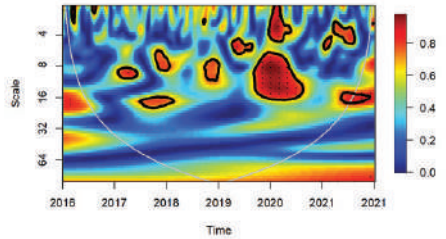
Argentina MERVAL vs. Ethereum
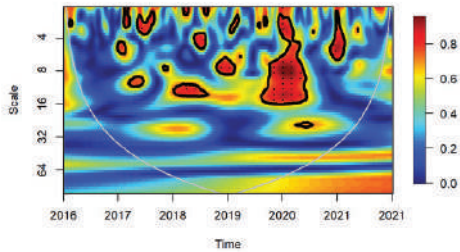

Mexico MXX vs. Ethereum
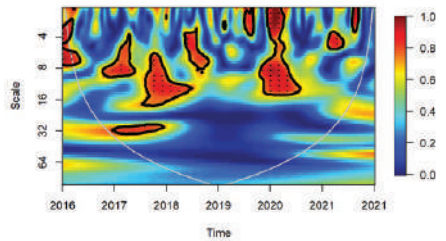

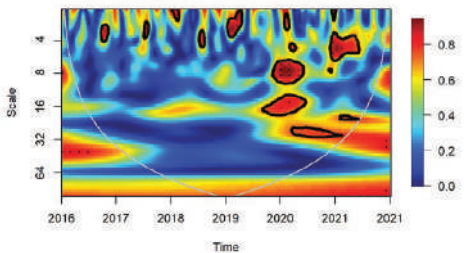United States DJI vs. Ethereum

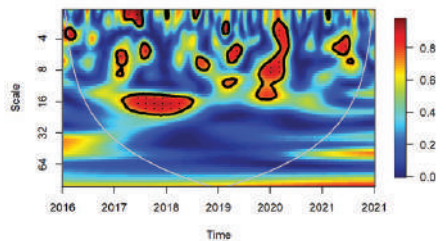United States SP500 vs. Ethereum

Brasi BVSP vs. Ethereum
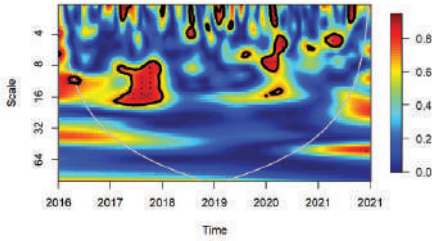

Peru BVL vs. Xripple
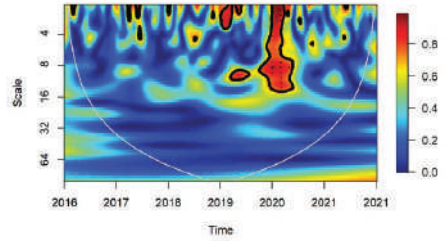

Chile IGPA vs. Ethereum
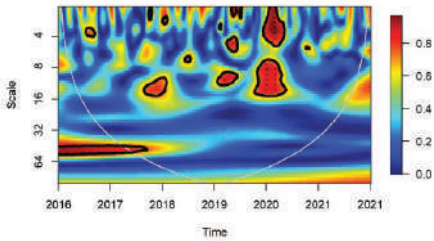

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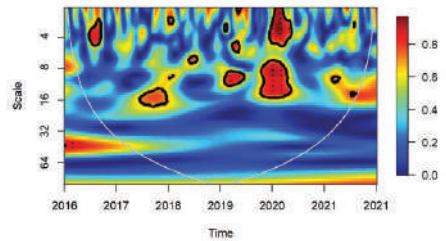
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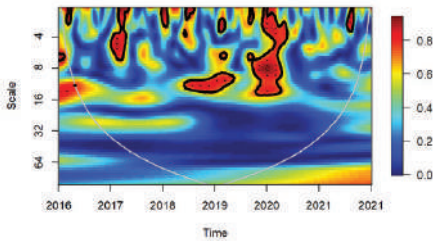

Mexico MXX vs. Xripple

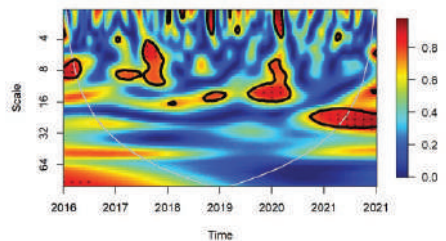

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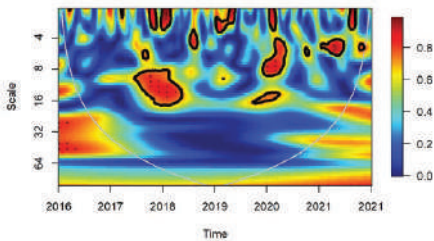

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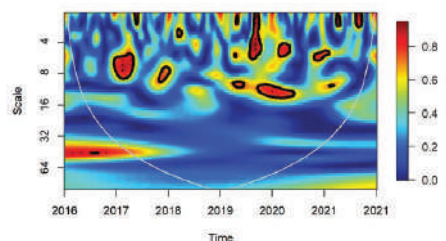

Brasi BVSP vs. Xripple

Gold vs. Xripple

Chile IGPA vs. Xripple

WTI vs. Xripple

SMEs strategies to enhance innovative work behavior of employees in United Arab Emirates (UAE)

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Abstract

People are considered to be a key enablers of innovation since they initiate the change as well as become part of a change which positively affects the innovation process. UAE is known to be an innovation-driven economy while the practices of Small and Medium Enterprises (SMEs) in UAE are little known. This paper aims to explore the strategies adopted by SME sector in UAE to enhance innovative work behaviour of employees. In this study, the researcher adopted the qualitative research to explore the strategies adopted by SMEs in UAE to enhance innovative work behaviour, A survey was conducted with 74 managers/ supervisors and leaders of SMEs in UAE through a structured questionnaire which attempted to ask about the strategies, how these are practiced by SMEs and what is the impact of these strategies on the innovative work behaviour. It was found from the research that the opportunity enhancing strategies namely autonomy, task composition and feedback positively impact innovative work behaviour of employees in UAE while ability enhancing strategy (training and development) and three motivation-enhancing strategies (reward and recognition, job security and employee involvement/ engagement).

Keywords: Innovation, innovative work behaviour, strategies, employees.

Introduction

Businesses need to offer value to all its stakeholders and constantly remain relevant to the changing needs of market or customers. The way(s) businesses evolve unique ways to deliver value or offering solutions to problems in a novel way, and the best experiences to its customers or markets will determine the success of any business in the competitive market. Innovation is all about implementation of new ideas in offering new products, services, processes, technologies, business models (Lijster, 2018) to deliver value to its customers or markets, innovation is considered imperative for the firms to be successful and to gain growth in today's extremely complex and competitive global economy. Innovation define the companies success in the market place to compete (Baregheh, Rowley, & Sambrook,

2009).For various contemporary institutions, innovation is regarded as a priority since it leads to finding solutions by thinking creatively and differently resulting in a significant impact on social and economic value (Kahn, 2018). People are found to be a key enabler of innovation in firms as found by previous literature (Li et al, 2019; Dalton, 2017; Palacios-Marqués et al, 2015). Human resources contribute significantly since innovation can be implemented only with the utilisation of the people skills (Meyer & Leitner, 2018).

For Small and Medium Enterprises (SMEs), the development of new products or processes that meets the needs of customers will determine how these companies will make profits and survive in competition (O'Regan & Ghobadian,

2006). The innovative practices offering new products or services or practices of markets and administrative procedures of SMEs will support these companies to overcome their challenges in the competitive market and improve their performance (Damanpour, 1992; Johannessen et al., 2001). To be innovative, companies must improve innovative work behaviour of their employees (De Spiegelaere, Van Gyes, & Van Hootegem, 2014).

In UAE (United Arab Emirates), 94 percent of companies are SMEs, supporting the country to earn 60 percent of its GDP, SMEs in UAE contribute to 86 percent of total private sector workforce (Mishrif & Al-Naamani, 2018). The report of GE Global Innovation Barometer found that United Arab Emirates is amongst the other countries that are engaged in innovative initiatives in its major industries like environment and energy, aerospace, logistics and transport. However, there is little research on the small and medium enterprises (SMEs) sector in the UAE. This paper aims to explore the strategies adopted by SME sector in UAE to enhance innovative work behaviour of employees.

Literature review

People as an enabler of innovation

Various resources are needed for the successful implementation of innovation in firms including financial resources as well as technological and human competencies. The most crucial resource is people (Li et al., 2019). Human resources form one of the key resources for executing innovation ideas irrespective of the type of innovation since employees are required to cooperate and work together for making innovation possible (Wang et al.,

making innovation possible (Wang et al., 2021). Other than the executor of innovation, employees are also the source of innovation by generating ideas and offering unique solutions to problems (Lee et al., 2018). Employees act individually as well as team members and use their creative minds and skills to directly or indirectly contribute in the implementation of innovation (Palacios-Marqués et al., 2015). Employees come together to suggest the ideas, experiment and execute them as well as analysing the important factors involved and evaluate the probability of its success by conducting mandatory investigation to reduce the chances of failure (Dalton, 2017). Because of the impact of employees' skills on the innovation outcomes as well as their contribution in the planning and execution of innovation ideas, it is crucial that employees' creativity is applied in a committed manner (Van Minh et al., 2017).

Innovative work behaviour of employees

Innovative work behaviour of employees refers to all employee behaviour which encourages the new idea generation and its execution with the aim of implementation innovation in a firm (Pradhan & Jena, 2019). The behaviour encourages the employees to take the initiatives and go out of the way to perform certain duties with the aim of suggesting and implementing innovative ideas. The employees are regarded as a vital factor in the implementation of innovation since they are likely to initiate change as well as accept the change initiated by someone else (Fan et al., 2020). Provided with a conducive environment, support and resources and given a clear vision, employees can be a significant force in a firm bringing an innovative change (Nazir & Islam, 2020). When firms offer favourable conditions to employees, they feel motivated to generate new ideas and

initiate and implement change effectively (Bos-Nehles et al., 2017). The innovative work behaviour is something which can be achieved through a number of interventions since employees behaviour can be manipulated through supportive factors making them behave in a certain manner (Stoffers et al., 2020).

Strategies to enhance innovative work behaviour of employees

Humans are complex organisms who have their independent thinking but can be driven by a number of factors (Thomas et al., 2017). Organisations use a number of strategies to make the employees behave the way they want with the aim of improving performance and productivity. Enhancing innovative work behaviour also requires implementation of some strategies. Bos-Nehles et al. (2017) and Vermeeren (2017) categorise the strategies into three categories, namely ability-enhancing strategies (training and development); motivation- enhancing strategies (reward and recognition, job security, employee engagement/ involvement) and opportunity- enhancing strategies (autonomy, task-composition, feedback).

Developing employees' creative skills is a key strategy to enhance their innovative behaviour (Montag-Smit & Maertz, 2017). As the business environment is continuously changing with technological advancements and process re-engineering being widely accepted as a means for increase in efficiency, there is a need for employees to regularly upgrade their skills and make themselves fit for the agile environment (Newman et al., 2018). Training and development enhance the abilities of the employees and make them more competent to initiate and bring changes needed for the innovation implementation. Highly trained and up-to-date employees are more likely to show innovative work behaviour because of their upgraded skills and expertise (Capozza & Divella, 2019).

When employees are motivated through appropriate strategies like rewards and recognition, job security and employee engagement/ involvement, they tend to contribute more towards the innovation environment (Fischer et al., 2019). Engaging and involving employees in the innovation activities make them motivated to implement change (Ahmed et al., 2018). Similarly, motivating employees through rewards and recognition for their innovative work behaviour encourage them to go extra mile for performing their tasks and initiating change by generating and implementing ideas (Choi et al., 2019). Providing job security is another strategy which enhances employee psychological contract with the organisations making them exhibit innovative work behaviour (Varma et al., 2017).

Strategies like providing employees sufficient autonomy, composing their tasks such that to include routine as well as non-routine tasks and complex tasks and providing them with regular feedback on their performance enhances innovative work behaviour in employees since these enhance the opportunities for the employees (Vermeeren, 2017). Employees behaviour get enhanced by the provision of such opportunities leading to cause and effect relationship (Rao, 2016).

By implementing appropriate strategies, the innovative work behaviour of employees can

be enhanced making the employees contribute towards innovation decision-making and implementation. They can also support the management in collecting the data for innovation purpose.

Innovation in UAE

UAE was ranked in the top 38 innovative driven economies in 2016 (Bani-Melhem et al., 2018). UAE has been emerging as a country having a positive attitude towards innovation with the government taking significant measures leading it to be an innovation-driven economy (Parahoo et al., 2017). The country is regarded to have a strong awareness towards innovation making the customers more demanding and causing the firms to adopt innovative practices to meet the changing customer preferences (Mohamed et al., 2019). The literature is found to be limited on the innovation practices of SME sector in the country. However, the recent 18% growth trends in the industry with 20% expected growth in the upcoming years hints towards the implementation of innovation measures by SMEs in the country.

Conceptual model

As the people are regarded as one of the key enablers of innovation, it is considered imperative for organisations to enhance their innovative work behaviour. The above discussion leads to the identification of key strategies which can be used to enhance the innovative work behaviour in employees. The study adopts Bos-Nehles et al. (2017) and Vermeeren (2017) categorises of the strategies which can affect innovative work behaviour, namely ability-enhancing strategies (training and development); motivation- enhancing

strategies (reward and recognition, job security, employee engagement/ involvement) and opportunity- enhancing strategies (autonomy, task-composition, feedback). The strategies are noted to be independent variable which affects the innovative work behaviour making it a dependent variable. The conceptual model developed for the research is presented in Figure 1 below:

The following hypotheses are developed for the research:

H1: Ability-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector.
H2: Motivation-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector
H3: Opportunity-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector

Methodology

This research adopts a positivist philosophy as scientific approach to collect and analyse the data is considered appropriate to study the relationship between the strategies adopted by SMEs in UAE and the innovative work behaviour of employees (Ryan, 2018). The theory as inferred from the previous research about the impact of appropriate strategies on innovative work behaviour is tested in the present research by formulating the hypotheses, gathering the data and analysing it test the hypothesis in the specific context of SME sector in UAE. Data is collected through quantitative approach by conducting a survey using a pre-designed questionnaire. The questionnaire uses likert scale questions as well as multiple choice questions to collect the data from the respondents.

Figure 1: Conceptual Model for Enhancing Innovative Work Behaviour of Employees
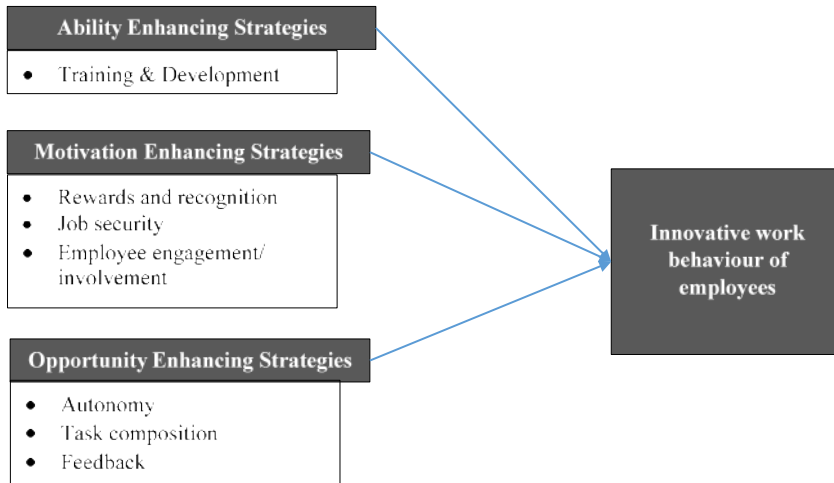
The sample consists of the managers/ supervisors and leaders in SME sector in UAE. Purposive sampling is done to identify the eligible respondents for the survey. The sample size planned was 100 out of which 76 filled and usable questionnaires were received. The survey was conducted via email. The data was analysed through SPSS software since it was quantitative in nature needing statistical analysis to assess the relationships between the independent variables (strategies) and dependent variables (innovative work behaviour of employees).

The respondents' participation was voluntary and their consent was taken. Moreover, the respondents were informed about the aim of the research and that the data will not be disclosed to any third party.

The reliability of the measurement scale was calculated through Cronbach alpha and the score was found to be 0.556.

Results

Demographics

Out of 100 potential respondents contacted for the survey, only 76 replied with completed and useable returned questionnaires. Majority of the respondents (N=41; 54%) were line managers with 2.04 mean and 0.682 SD showing data points to be closer to mean. A high proportion of the respondents (N=47; 62%) were in the age group of 35-49 with mean value 2.86 and SD 0.65. 45% of the respondents (N=34) had experience of 11-15 years with mean value 3.62 and a higher SD value of 0.748 indicating a larger spread of data values. Out of 76 respondents, majority (N= 41; 54%) held Masters degree with 1.62 mean value and a lower SD value of 0.565.

Table 1: Demographics of the Survey Respondents

		N	%	Mean	SD
Job Role	Senior management	16	21.10%	2.04	0.682
	Line manager	41	53.90%		
	Team leaders	19	25.00%		
Age Category	Less than 25	0	0.00%	2.86	0.605
	25 – 34	20	26.30%		
	35 – 49	47	61.80%		
	50 – 64	**9**	**11.80%**		
Experience	Less than 1 year	1	1.30%	3.62	0.748
	1 – 5	1	1.30%		
	6 – 10	32	42.10%		
	11 – 15	34	44.70%		
	Over 15 years	8	10.50%		
Education	Bachelors	32	42.10%	1.62	0.565
	Masters	41	53.90%		
	PhD	3	3.90%		
	Others	0	0.00%		
Total		76	100%		

Correlations

The survey aimed to assess the relationships between strategies adopted to enhance innovative work behaviour with the innovative work behaviour to evaluate how the strategies affect the behaviour. Table 2 presents the correlations matrix for the variables. It can be seen that there is positive liner correlation between employee engagement and autonomy (0.250) showing that higher autonomy leads to better employee engagement. Positive correlations also found between employee engagement and task composition (0.457), and autonomy and task composition (0.244) confirming their strong relationships. Negative correlation was found between employee engagement and feedback (-0.230) showing that greater employee engagement leads to lesser feedback.

When the relationships between innovative work behaviour and various strategies were assessed, all the three opportunity enhancing strategies namely autonomy, task composition and feedback were found to be positively correlated with innovative work behaviour with values of 0.276, 0.254 and 0.259 respectively. This means that when employees were given autonomy, were provided with specific task composition and were given feedback, their innovative work behaviour was found to be improved. There was no positive relationship found between the ability enhancing strategy (training and development) and three motivation-enhancing strategies (reward and recognition, job security and employee involvement/engagement).

Table 2: Correlations between Variables

		Training and Development	Reward Recognition	Job Security	Employee Engagement	Autonomy	Task Composition	Feedback	Innovative Work Behavior
1. Ability-enhancing Strategies	Training and Development	1							
2. Motivation-enhancing Strategies	Reward Recognition	-.031	1						
	Job Security	-.003	.002	1					
	Employee Engagement	.034	.103	.132	1				
3. Opportunity-enhancing Strategies	Autonomy	.014	.016	.188	**.250***	1			
	Task Composition	-.119	.045	.184	**.244***	**.457****	1		
	Feedback	.041	-.062	.139	**-.230***	-.127	-.082	1	
Innovative work behaviour	Innovative Work Behavior	-.026	.154	.051	.099	**.276***	**.254***	**.259***	1

Examining the Relationships

A simple linear regression was conducted to examine the three hypotheses, as proposed through the framework.

H1: Ability-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector.

The regression analysis led to the rejection of the hypothesis 1 ($p > 0.05$) indicating that ability enhancing strategies (i.e. training and development) have no significant influence on the innovative work behaviour of employees in the SME sector of UAE. The correlation between the two variables was weak (0.026). Hence hypothesis 1 is rejected.

H2: Motivation-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector.

The regression analysis led to the rejection of the hypothesis 2 ($p > 0.05$) indicating that motivation enhancing strategies (i.e. Reward and recognition, Job security, and employee engagement) have no significant influence on the innovative work behaviour of employees in the SME sector of UAE. Hence hypothesis 2 is rejected.

H3: Opportunity-enhancing strategies have a positive influence on innovative work behaviour of employees in the UAE's SME sector.

The linear regression conducted between the independent variable (opportunity enhancing strategies which include Autonomy, Task composition and Feedback) and the dependent variable (innovative work behaviour) led to significant outcome ($p < 0.05 = 0.02$). The correlation strength of the variables was 0.432 which is moderately strong whereas the variance caused by the independent variable in innovative work behaviour of employees was identified as 18.7%. Amongst the three sub-factors of opportunity-enhancing behaviour, only autonomy and feedback were found to have significant contribution ($p < 0.05$). Hence, the hypothesis 3 is accepted.

Table 3: Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.432**[a]	**.187**	.153	3.04429

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153.502	3	51.167	5.521	**.002**[a]
	Residual	667.274	72	9.268		
	Total	820.776	75			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.157	3.763		3.763	.000
	Autonomy	.421	.214	.236	1.969	**.05**
	Task Composition	.329	.230	.171	1.430	.157
	Feedback	.622	.220	.303	2.824	**.006**

The examination identifies positive relationship between opportunity enhancing strategies namely autonomy, task composition and feedback with innovative work behaviour while no relationship between ability enhancing strategy (training and development) and three motivation-enhancing strategies (reward and recognition, job security and employee involvement/ engagement) and innovative work behaviour.

Discussion

People have been identified as one of the key enablers of innovation as evidenced from previous studies (Wang et al., 2021; Li et al., 2019; Dalton, 2017). Employees can play a key role in initiating the innovation as well as implementing it when introduced by the management. Provided with the favourable environment and supportive culture, employees act individually as well as the team members to initiate change, generate ideas and be part of the innovation implementation (Van Minh et al., 2017). Since organisations get their activities done through their employees who undertake a number of tasks for collectively achieving business objectives, innovation practices are greatly affected by employees' activities as well as behaviour (Akram et al., 2017). As employees can be made to behave in a desired way through adopting a number of strategies, the impact of these strategies on innovation needs to be assessed (Yi et al., 2019). Through conducting preliminary research, it was found that there is limited research on the SMEs industry in UAE on the area of innovation. This study thus attempted to survey the leaders in SMEs to know what strategies are being adopted by them to enhance the innovative work behaviour of employees.

From the findings of the survey, the SMEs in UAE were found to implement all the strategies to enhance the innovative work behaviour of employees which are found to be implemented to make the employee behave such that to generate new ideas, initiate the change and be a positive actor in innovation implementation. Previous studies (Bos-Nehles et al., 2017; Vermeeren, 2017) identified seven strategies grouped in three categories which can be implemented to enhance innovative work behaviour of employees namely one ability enhancing strategy (training and development), three motivation-enhancing strategies (reward and recognition, job security and employee involvement/ engagement) and innovative work behaviour and three opportunity enhancing strategies (autonomy, task composition and feedback). The findings confirmed that the SMEs in UAE implemented all these strategies to enhance the innovative work behaviour of their employees. The findings show strong commitment of the SME sector in the country towards implementing innovation and attempting to create a favourable environment by ensuring employees' innovative work behaviour is enhanced. The correlation analysis found that only opportunity enhancing strategies positively impact innovative work behaviour in SMEs in UAE as also supported by Vermeeren (2017) and Rao (2016).

The other two categories namely ability-enhancing and motivation-enhancing strategies did not impact the innovative work behaviour of employees in SMEs in UAE. This finding is contradictory to previous studies (Capozza & Divella, 2019; Fischer et al., 2019; Ahmed et al., 2018; Choi et al., 2019; Varma et al., 2017) which evidenced that training and development, reward and recognition, job security and

employee involvement/ engagement positively impact innovative work behaviour. The findings of the survey led to the determination of lesser impact of ability-enhancing and motivation-enhancing strategies on employees' innovative work behaviour which is striking since previous literature pointed out what training and development and motivating employees make them more creative and innovative (Waheed et al., 2019; Boadu et al., 2018; Sung & Choi, 2018). Surprisingly, the SMEs in the UAE seem to agree with the positive impact of training and development and motivation strategies in enhancing their innovative work behaviour as evident from their increased adoption of these strategies.

The impact of autonomy, task composition and feedback on enhancing employees' innovative work behaviour confirms the importance of two way communication with employees as well as delegation, employee empowerment and job design leading to enhanced innovative behaviour. When employees are given the autonomy and required feedback for their work which has been designed effectively to include routine, non-routine, complex and non-complex tasks, they are expected to behave innovatively and increase their contribution towards the innovation implementation.

Conclusion and Recommendations

This paper attempted to explore the strategies adopted by SME sector in UAE to enhance innovative work behaviour of employees by conducting a survey of 74 managers/ supervisors and leaders in SME sector in UAE. It is concluded that opportunity enhancing strategies namely autonomy, task composition and feedback positively impact innovative work behaviour of employees in UAE while ability

enhancing strategy (training and development) and three motivation-enhancing strategies (reward and recognition, job security and employee involvement/ engagement) were not found to impact innovative work behaviour. Although the SMEs in UAE were found to be implemented by SMEs in UAE which shows their commitment towards enhancing the innovative work behaviour of their employees, it is recommended that the SMEs focus more on implementing the strategies namely autonomy, task composition and feedback to enhance their innovative work behaviour. The employees should be made autonomous and their tasks should be designed such that to include routine, non-routine, complex and non-complex tasks. Moreover, they should be given regular feedback on their activities. Since these strategies enhance the innovative work behaviour, the SMEs must focus on these strategies to ensure that the employees behave in a favourable way to implement the innovation successfully. By giving importance to these strategies, the capabilities can be directed in the right direction increasing the potential of innovation success.

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Job satisfaction and job contentment in the context of the Nigerian banks

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Abstract

This study examined the relationship between job satisfaction and job contentment in the context of Nigerian banks using selected banks in the Southwest of Nigeria as the unit of analysis. A structured questionnaire was administered to elicit relevant information from 123 respondents using both stratified and simple random techniques. The study identified six (6) components of job satisfaction that drive job contentment such as job security, salary, human relations, promotion, organizational benefits, and job characteristics, and also established a positive relationship between job satisfaction components and job contentment. It was found that salary, job security, and organizational benefits drive job contentment more among employees in the banking industry but job security was considered to be the most potent drive of job contentment among all while the relationship among all the job satisfaction components with job contentment was a moderate relationship except human relations that has a weak relationship at 0.05 level of significance. The regression result showed that all the components of job satisfaction have an effect on employee job contentment and it was concluded that the six components of job satisfaction should be entrenched in the organizational retention strategies to guarantee job contentment among employees in the banking industry. Thus, recommended that the implementation of the organizational policies towards the components of job satisfaction should be fair, just, and free of any form of sentiments that can affect their perception and feelings about these components.

Keywords: Employee job satisfaction, Job contentment, Job security, Promotion, Human Relations

Introduction

The rationale behind the functional operation of any business organization is profit maximization which implies effective and efficient utilization of all the resources at the disposal of the business organization i.e. both human and material resources. The resource-based view school of thought believed that the quality of human resources available in any organization at a given time will somewhat determine the degree of success of the organization in pursuit of profit maximization objectives. It is this human resource element that will interact with other resources in the organization to get the desired result and this can be interpreted to imply that the higher the quality of human resources in an organization, the higher the attainment of profit maximization objective and vice-versa (Barney, 1991). This was anchored on the belief that human resource varies in terms of quality as a result of job exposure, job experience, and work relationship as well as a natural endowment, job knowledge, and level of education, not only that, human resource is the strongest source of

of competitive advantage being a unique and valuable resource, rare, inimitable and non-substitutable. This explains why organizations constantly strive to attract qualified and competent employees into their services being a way to actualize the organizational objective although it is often difficult to keep cream of competent employees on account of differences in the expectations of employer and employees which are deeply rooted in their commitments and often determines the level of job satisfaction. However, what happens when these expectations are not met? Nevertheless, policies are formulated to guide the interaction of the human element with other resources in practice to standardize their operations and the expected results. These policies are employee-work relationship-centered which connotes a lot of expectations and assumptions (psychological contract) wherein all behavioral activities are determined and areas such as sources of loyalty, commitment, and retention as well as satisfaction, absenteeism, and contentment manifesting in the workplace (Abebe & Markos, 2016; Armstrong & Taylor, 2017).

Since policy put in place will determine the direction of practice in the workplace, human resource policies formulated to guide behaviors and expectations of employees should address employee happiness on the job as postulated by Moonsri (2018) corroborated by Aeknarajindawat and Jermsittiparsert, (2020) that job happiness is the most important thing that every employee has in mind when making employment decision whether to join an organization or not to join to be fulfilled. This decision is what will determine the level of employee job satisfaction as it is reviewed from time to time to know if it was the right decision or not by evaluating the extent to which the hopes, desires, and expectations about employment upon engagement have been met or fulfilled. An organization should therefore comprehend the concept of job happiness vis-a-vis job satisfaction, and strive to develop one that will be concerned about how to make their employees happy or satisfied on the job although the position of Mullins and McLean (2019) has been contested and criticized that happy workers are productive workers nevertheless the contribution to productivity was not to be discarded nor considered insignificant. Job happiness is contingent upon many variables embedded in job satisfaction and job contentment and this explains the position of Rana and Singh (2017) that when an organization neglects employee work satisfaction in job satisfaction, it is a failure signal as the organization would be devoid of committed employees who are only marking time for another job opportunity elsewhere.

This concern for employee job satisfaction is a worthwhile investment when the business environment is competitive, turbulent, and unpredictable wherein business organizations are experiencing high labor mobility which is prevailing in a business environment like Nigeria, especially in the banking sector which has witnessed a lot of technological changes as a result of the COVID-19 experience. In Nigeria today, the banking job is considered to be a high profile and lucrative job by implication should give any employee in that industry job satisfaction that would herald job contentment and retention since the working environment is ambient with the latest art of technology but the reality is contrary. Why would an industry with a high profile for lucrative jobs constantly witnesses an exodus of employees as the employee turnover has been very high in

the last one (1) decade? The implication is non-congruence between job satisfaction and job contentment and this explains why employees in the industry have become nomadic by constantly seeking a job elsewhere and at the same time why banks are leaking away profit due to the instability in their workforce caused by high mobility of labor thus hindering quick economic recovery especially, in the aftermath of COVID – 19 experience since the quality of human resources available in any organization at a given time will somewhat determine the degree of success of the organization in pursuit of profit maximization objectives. The high mobility of labor in the banking industry is evident that Nigerian banks' employees were not contented with their job (Oginni et al., 2018) and this compelled the sector to embark on different strategies concerning cost control and retention strategies.

Job contentment is deeply rooted in the feelings and emotions expressed by an individual employee towards their job to derive self-fulfillment and accomplishment which implies that job satisfaction and job contentment are Siamese twins because job satisfaction measures workers' contentedness with their job to cognitive, affective, and behavioral components i.e. the degree of employee job satisfaction will have bearing on the level of employ job contentment. The position of Oginni et al. (2018) on the relationship between job satisfaction and working conditions could be used to summarize the relationship between job satisfaction and job contentment where it was opined that the higher the level of employees' job satisfaction with working conditions, the higher the level of job contentment among employees in the workplace but those components of job satisfaction that would herald job

contentment were never identified as predictor variables, likewise, was the work of Waqas et al. (2014) on the factors influencing job satisfaction and its impact on job loyalty where the focus was mainly on influencing factors and job loyalty.

Despite the enormous depth of literature on job satisfaction, most of the research studies focused on job satisfaction and employee commitment (Ali & Wael, 2017; Tella et al., 2007; Mohamed, Kader & Anisa, 2012), job satisfaction and productivity (Berliana, Siregar, & Gustian, 2018; Mullins & McLean, 1993; Masum, Azad, & Beh, 2015), job satisfaction and job characteristics (Begley & Czajka, 1993; Rana & Singh, 2017), job satisfaction and employee retention (Swaminathan & Jawahar, 2013; Aeknarajindawat & Jermsitti-parsert, 2020; Armstrong & Taylor, 2017), job satisfaction and labor turnover (Oginni et al., 2018; Vidal, Valle, & Aragón, 2007; Spector, 1997) while past studies in the area of job satisfaction and job contentment have been very few and had not been properly integrated. There is little evidence about job satisfaction and job contentment in the Nigerian business environment, especially in the banking industry. Therefore, there is a necessity to conduct empirical research about exploring the relationship between job satisfaction and job contentment. Based on the above gaps, the study aimed to identify job satisfaction components that drive employee job contentment and investigate the relationship between job satisfaction components and job contentment. Hence, the study.

Literature Review

Job Satisfaction

It is a multi-dimensional construct that is anchored on the attitude of employees toward their job which may be positive or negative (Mullins & McLean, 2019). It is more of an attitude expressing feelings towards the organization, job characteristics, fellow workers, supervision, and psychological, and physiological needs in the work environment. This implies there were other variables outside the job itself responsible for the satisfaction or otherwise of employees in the workplace and these factorial variables can be summarized into two namely; intrinsic and extrinsic variables. Intrinsic variables, it is meant to be those variables associated with the contents of the job while extrinsic variables imply those are related to the work environment or conditions i.e. revolves around general satisfaction, internal work satisfaction, and growth satisfaction to determine the levels of what is being considered satisfactory by employees (Adeniji et al., 2018). Job satisfaction can therefore be described as an employee's attitude towards various aspects of their job as well as the job in general. The views expressed by Agbozo, Owusu, Hoedoafia, and Atakorah (2017) that the levels of employee job satisfaction in the workplace will determine a lot of activities in the organization because it is the employee as the human element that interacts with other resources. It was further argued that, there were three levels of satisfaction (high, moderate, and low) and that where it is high, other corresponding activities will also be high and vice versa.

Masum et al. (2015) described job satisfaction as the outer expression of the emotional state and attitude of employees towards work. Job satisfaction has been linked to many variables in the workplace such as absenteeism, labor turnover, productivity, commitment, retention, loyalty, contentment, work relationship, performance, compliance behavior, and job stress and involvement. It was asserted that the degree of satisfaction enjoyed by employees in their job will invariably determine the corresponding attainment of each of these variables. Not limited to this, Masum et al. (2015) argued further that employees' perception of job satisfaction correlates with work responsibilities which could be positive or negative. Waqas et al. (2014) corroborated this position and advocated that any organization that desires the attainment of organizational objective i.e. profit maximization should incorporate employee job satisfaction in their daily mode of operation with emphasis on each of the work satisfaction factors otherwise, profitability will be leaked away through costs associated with industrial vices, hiring of staff, sabotage, theft, and dispensary visits. Swaminathan and Jawahar (2013) also corroborated these two positions with a clear assertion that the first source of employees' job satisfaction was employees' expectations from the work i.e. how the employer meets these expectations, especially the aspect of the psychological contract and the appraisal of these expectations would determine employees' behavior to work responsibilities in terms of efficiency and effectiveness. Swaminathan and Jawahar (2013) argued further that since an employee's job satisfaction is a feeling about a phenomenon, it is, therefore, more of a resultant effect of motivational tools that will make the employee willing to remain with an organization for a long period. Therefore, every organization should understand the expectations of employees from their job and their workplace and build employees' job satisfaction on these expectations to enshrine positive job contentment. Abiodun, Oyeniyi, and Osibanjo (2013)

identified promotion, job security, working hours, and salary as intrinsic elements that can bring satisfaction to employees.

However, Abebe and Markos (2016) added to this, to include job security, promotion, supervision, compensation, and organizational image to boost employees' happiness while Begley and Czajka (1993) put forward job characteristics, training, human relations, compensation, job enrichment, recognition, and organizational benefits as elements which were components of job satisfaction that could be used to drive employees' contentment in the workplace. This was also corroborated by Berliana et al. (2018) who believed that job security and compensation were of high significance to employees. Mohamed et al. (2012) examined the relationship between organizational commitment, trust, and job satisfaction, the result shows that job satisfaction is strongly and positively correlated to the three dimensions of job commitment i.e. continuance commitment, affective commitment, and normative commitment while Tella et al. (2007) investigated the roles of work motivation, job happiness, and organizational commitment on job satisfaction using library workers in the academic and research environment in Oyo State, Nigeria. It was found that there was a positive and direct relationship among all the variables and that people management was a crucial part of the management process at work and the recognition of the human element was also critical to the success of the organization while Waqas et al. (2014) identified four factors influencing job satisfaction to include workplace environment, empowerment, and participation in decision making as well as reward and recognition wherein the results showed that there was a positive and strong relationship between job satisfaction factors and job loyalty. It was concluded that job loyalty was often responsible for job satisfaction level and most factors affecting job satisfaction were workplace environment, empowerment, reward, and recognition.

Therefore, the components of job satisfaction could be summarized to include job characteristics, job security, working hours, salary, training, human relations, job enrichment, promotion, recognition, organizational benefits, and supervision.

Job Characteristics

Job characteristics have been considered one of the vital elements in the prediction of employee job satisfaction in the workplace and there exist numerous definitions from the literature. Begley and Czajka (1993) described it as a framework that depicts the operational outlook of a job, the basic parameter of a job, and the psychological state of a job. According to Hackman and Lawler (1971), it is a model that attempts to classify the basic parameters of a job as each affects the psychological state of the employee, especially, concerning motivation and contentment. However, the model of Hackman and Oldham (1974) laid the foundation for the understanding of job characteristics which has five different elements such as task significance, task identity, skill variety, autonomy, and feedback. McShane and Von Glinow (2018) asserted that employees with a higher level of these characteristics have a higher level of internal work motivation, work effectiveness, and job satisfaction. It was also found that job characteristics have an influence on the critical psychological states of employees in the workplace and this invariably influences employees' personal and work

outcomes based on the strength of the employee's growth needs (Griffin, Phillips, & Gully, 2016; Cascio, 2003; Snell, Bohlander, & Bohlander, 2010). Steyn and Vawda, (2014) corroborated earlier studies and stated that job characteristics are more often correlated with a job-specific behavioral outcome than with general work outcomes. From the above discussion hypothesis one is postulated as:

H_1: job characteristic has positive effect on employee job contentment

Job Security

Job security has been adjudged as a significant determinant of job satisfaction and increasingly becoming more significant because it is what all personnel in the workplace wished for in the wake of an economic recession or depression which is characterized by the absence of alternative jobs and low economic activities (Abdullah & Ramay, 2012). This has been described by Ogunbanjo (2021) as the assurance of job continuity under whatever economic conditions are being experienced by an organization. It is about employees' beliefs about permanence in their employment. This gives a sense of commitment and increases the confidence level of employees with the desire to remain and identify with the organization over a longer period without any fear of job loss due to economic hardship or wrongful dismissal (Artz & Kaya, 2014). The degree of job security varies from one job to another job and one organization to another organization which has an effect on the employee's steadfastness to their job and organization as it is centered on the degree of attachment of employees to their job. Clark (2001) stated that job security is among the important factors of the negative predictor of deviant behavior in the workplace

which was supported by Artz and Kaya (2014) where it was posited that security from the loss of a job is more valuable where unemployment is more likely to persist and, in such a situation, employee job satisfaction may increase with job security especially when job vacancies are scarcely more than when job vacancies are in multiple folds. Among the past studies was the conclusion drawn by Ogunbanjo (2021) that the job security of employees at the workplace is a function of many variables caused by both internal and external factors of business organization with effect on organizational outcomes and hence, the postulation of the second hypothesis as:

H_2: job security has positive effect on employee job contentment.

Salary

Salary is another important element of job satisfaction and it is the monetary value offered by the employer to employees in an organization in exchange for the services rendered towards the attainment of the organizational objective of profit maximization (Berliana et al., 2018). This monetary value can either be satisfying or not satisfying and in the summation of Heneman and Schwab (1985), salary satisfaction is described as the degree to which employees are satisfied with their current salary. By implication a worker has that tendency to perform to the endowed potential if there is satisfaction with the salary being earned as such an employee would like to please the employer to retain his or her position, derive a feeling of security, high status ranking, and desire to put in extra hours (Clark, 2001). From the past studies there were two different schools of thought, the first school of thought anchored by Srivastava, Locke, and Bartol (2001); Malka and Chatman (2003), argued

that the level of pay had little relation to either job or pay satisfaction to imply that within an organization, those who make more money are little more satisfied than those who make considerably less which was also buttressed by Judge et al. (2010) that the samples of well-paid individuals were trivially more satisfied than the samples of poorly paid individuals while the second school of thought believed that employees' salary satisfaction is synonymous with employee enthusiasm in the workplace and outside the workplace (Gerhart & Rynes, 2003; Lee & Lin, 2014). On this basis, the third hypothesis was formulated as follows:

H3: salary has positive effect on employee job contentment.

Human Relations

This is described as the ways by which managers interact with their subordinates to create a family-like atmosphere that would herald a conducive environment for enhanced productivity and which could also apply to the relationship between one employee and another. Therefore, human relations at work is the study of human behavior which aimed to create a good response from a fellow human being at work. According to Begley and Czajka (1993), human relation is a good determinant of job satisfaction without cost implication on the organization and a very useful instrument to resolve conflicts and foster workplace culture between different employees or between employees and the management. According to Tella et al. (2007), human relations has been singled out among several reasons underlying employees' intention to quit their job i.e. good human relations among members of the organization and management, superior and subordinates is a potential source of employee retention and vice versa while Ali and Wael

(2017) posited that human relation is cost-effective to model employees' attitude, especially during recession or depression where organizations could not meet some of the expectations of the employees and Berliana et al. (2018) stated that a work atmosphere of tranquility heralding peace and harmony was linked to human relations while Akbari (2005) corroborated by Zabihi et al. (2016) that the operationalization of human relations practice is contingent upon the prevailing leadership styles in the organization. Therefore, the fourth hypothesis was formulated as:

H4: human relation has positive effect on employee job contentment.

Promotion

According to Sikula (2000) promotion has been technically defined as an upward movement within an organization usually from a position of lower responsibilities to another that involves either an increase in wages or an increase in status and sometimes both. Siagian (2003) asserted that promotion signifies recognition of contribution towards the attainment of the organizational objective, a way of reposing trust, and confidence. Several studies have shown that promotion is paramount to employees' careers which affects other facets of the work experience and it is an integral part of workers' labor mobility which most often comes with substantial wage increases (Abebe & Markos, 2016; Abiodun et al., 2013; Blau & DeVaro 2007; Francesconi, 2001; Hersch & Viscusi, 1996, McCue 1996, Olson & Becker 1983) while Pergamit and Veum (1999) posited that promotion has a significant influence on other job characteristics such as job attachment and responsibilities. Also noted that promotion is an instrument used to reward workers that are highly productive thus serving as an impetus

for workers to exert greater efforts. Gerhart and Rynes (2003) asserted that promotion will only be an effective mechanism to elicit greater effort if employees place significant value on the promotion itself otherwise, it will be counterproductive. To Shields and Ward (2001), employees that were dissatisfied with the available opportunities for promotion showed greater intention to leave the organization, and those employees that perceived available opportunities as golden chances for promotion feels satisfied and willing to remain with the organization over a long period to actualize the promotion potentials and thus informed the formulation of the fifth hypothesis as:

H_5: promotion has positive effect on employee job contentment.

Organizational benefits

This is described as the non-wage compensation made available to employees by the employer in the workplace over salary from time to time. It is considered a privilege that comes in different forms and serves as support to employees in meeting needs that could not be met by their salary. In previous studies, it has been described as any form of compensation provided for the employees to meet their social and economic needs other than direct wages, and such benefits are usually financed by the employer sometimes wholly or in parts (Begley & Czajka, 1993; Gerhart & Rynes, 2003). It varies from organization to organization which could be categorized into two namely requirement by law and management discretion and it serves different purposes (Clark, 2001). According to Ogunbanjo (2021), the organizational benefit is a pull factor for an organization that can offer acceptable benefits to the employees in their workforce which have

been instrumental to the ability of a business organization to attract qualified and competent applicants in the labor market to join the organization if found appointable. In the views expressed by (Oginni et al., 2018), the atmosphere in the work environment is contingent upon the quantum of organizational benefits made available by the management of the organization and a good measure of the satisfactory level of employees with their job. Begley and Czajka (1993) also posited that employees often use the level of organizational benefits enjoyed as a determinant of good employment which affects what constitutes job satisfaction with job contentment and this led to the formation of hypothesis six as

H_6: organizational benefit has positive effect on employee job contentment.

Job Contentment

As earlier observed that job satisfaction and job contentment are Siamese twins because job contentment is also an expression of personal feelings on how work affects employees' personal lives while job satisfaction is a measure of employee contentedness. It also has bearing on employees' dedication, loyalty, and devotion, at the same time increasing motivation, productivity, and commitment. To Vidal et al. (2007) Job contentment is complicated and complex on account of features such as salary, workplace, independence, communication, and commitment which are usually at the discretion or prerogative of management, also, deeply rooted in the beliefs and philosophies of the business owner, the nature of the business, the prevailing economic conditions, constraints of the labor market, and technological opportunities. Abiodun et al. (2013) linked job contentment to a healthy work environment and in the views expressed by Ali and Wael (2017) job

contentment was considered as the favorableness with which workers perceive their work i.e. the amount or level at which employees sense their job circumstances, whether constructively or undesirably while Begley and Czajka (1993) linked job contentment to organizational productivity, employee's performance, and motivation with an emphasis on human relations as a determining factor among other factors in organizational productivity and employee performance. This implies that where job contentment gets better, the productivity of the organization will always be higher as long as human relations are not neglected while Berliana et al. (2018) believed that a work atmosphere of tranquility where peace and harmony are prevalent can be a good source of job contentment. Ali and Wael (2017) also linked it with organizational commitment and turnover without the establishment of the predictive model but confirm the same pattern of attitudes about various aspects or facets of the job in the workplace i.e. employees' attitudes toward job consequences.

In the earlier work of Spector (1997) work contentment was said to be inversely connected to some withdrawal behaviors in the industrial world of work such as lateness, non-attendance, and labor turnover as well as dispensary visits, and in addition, associated with greater efficiency and organizational usefulness behaviors. However, the study on work satisfaction with its relationship to performance has been a continuously arguable subject. Thus, satisfaction leads to contentment, contentment leads to commitment, and commitment leads to performance, and therefore, gratifications will serve as impetus that will trigger contentment and performance (Swaminathan & Jawahar, 2013). Oginni et al. (2018) posited that gratifications

lead to satisfaction and not performance which implies that satisfaction does not guarantee performance but rather will induce corresponding satisfaction and performance. It was argued further that any modification in the employees' performance is not solely related to alteration in job satisfaction components, but also the availability of commensurate gratifications to induce expected behaviors. Similarly, employee job satisfaction is ambiguous in that personality of employees in terms of their needs in the workplace entails so many things as illustrated in Maslow's hierarchy of needs i.e. as the lower needs are met, the next need is considered important while some needs that were previously met might become necessary under exigencies of circumstance, for example, loss of job.

Theoretical Review

Two theories were found to be quite relevant to this study namely Herzberg's two-factor theory and Maslow's hierarchy of needs, however, Herzberg would be given priority because of the main focus of the theory i.e. motivator and satisfier variables.

Herzberg's Two-Factor Theory

This theory was propounded by Frederick Herzberg. Herzberg came up with this notion after conducting a series of interviews with accountants and engineers. Among the questions answered were what satisfied these people at work and what dissatisfied them at work. As a consequence of this research, it was established that two factors do influence job satisfaction and the first was called the motivators and the second hygiene factors. These two factors were also known as the two-factor theory since it includes both motivation and hygiene components. Going by the idea, there

were some characteristics in the organizational environment that, if present, will stimulate employees, and certain factors that, if present, will satisfy employees, but if not, will not lead to dissatisfaction. Satisfied employees are those who believe their motivational and hygienic needs have been adequately addressed. Work itself, responsibility, recognition, advancement, achievement, and growth are examples of motivational factors, while hygiene factor has company policies, supervision, pay, interpersonal relationships, job security, physical working environment, coworker, and relationships. Abraham Maslow's theory which was the hierarchy of needs was also relevant as it offers a descriptive illustration of what motivates employees in their place of work. To Maslow, employee satisfaction of human needs at work represents job satisfaction from basic needs to safety needs, to belongingness needs, to esteem needs, and finally to self-actualization needs. Based on the Maslow concept, researchers have benefited and identified sufficient job satisfaction factors in meeting these conventional needs.

Methodology

The study was domiciled in Akure, Ondo State, Southwest Nigeria within a period of eight (8) months from September 2021 to April 2022 and made use of a descriptive survey research design. Data were collected through the use of primary (questionnaire) and secondary (books and journals) sources of data collection. The population of the respondents in the studied area (Guaranty Trust Bank, Stanbic IBTC, and Access bank, as well as WEMA, Zenith, and Polaris Banks) was 200 and 133 respondents were selected as the sample size with the aid of Yamane's sample size formula. The study used multi-stage sampling techniques (stratified, proportional, and simple random sampling techniques,) because the stratified sampling technique was to ensure that the basic characteristics of the sample size were captured, proportional sampling technique to balance the variation in the respondents' size gotten from each of the studied areas, and simple random sampling technique was used to administer the questionnaire to avoid bias. Before the administration of the main research instrument

Job Satisfaction Components
Independent variables   **Dependent variable**
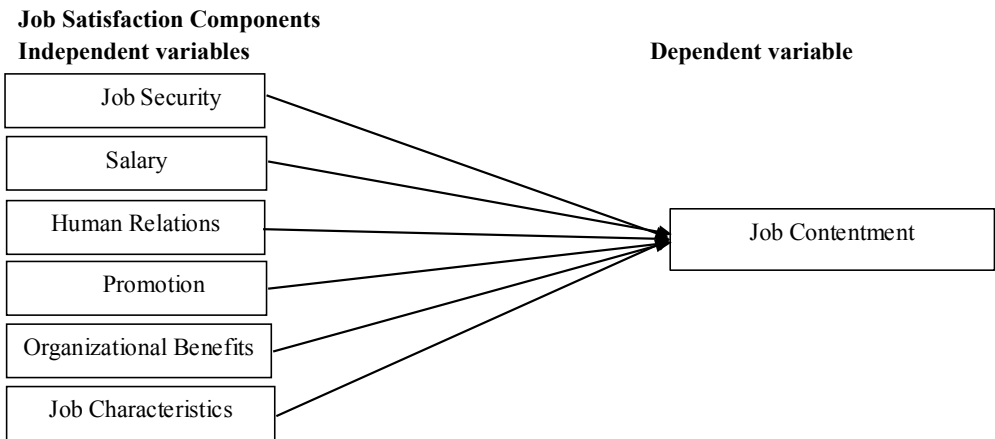

Fig 1: Conceptual framework depicting the variables and direction of the study

(questionnaire), a pilot study was employed and necessary modifications were made to the research questionnaire.

The questionnaire was structured in conformity with Likert 5 points rating scale and the measurement scales for the independent variable were Job Satisfaction Survey (JSS) and Job Descriptive Index (JDI) scales adapted from Spector (1985) and Smith, Kendall, and Hulin (1969) with 24 items mapped into 6 dimensions while job contentment measurement scale was adapted from Wood, Stride, and Johnson (2012) with 7 items. Cronbach's Alpha values for job security, salary, human relations, promotion, organizational benefits, and job characteristics were 0.821, 0.812, 0.856, 0.847, 0.802, and 0.811 while that of job contentment was 0.911. Regarding the position of Hair, Risher, Sarstedt, and Ringle (2019) on when the value of coefficient alpha is considered poor, good, and excellent. It is poor when it is less than 0.6, good when it is within the range of 0.6 – 0.8 and excellent when the range is greater than 0.8. The values for this study ranged between 0.80 and 0.91, therefore, it was found adequate for the study. The questionnaire was divided into three sections labeled sections A, B, and C wherein section A contained biodata information of the respondents, section B contained information on the components of job satisfaction, and section C has information on job contentment. All the questionnaires administered were collected however, 123 of the questionnaires were found adequate for analysis purposes representing a 92% respondent rate which was considered to be adequate and were subjected to both descriptive (mean, standard deviation, and Kendall concordance of agreement) and inferential statistics (Pearson coefficient Correlation and Regression).

Results and Discussions

The data collected through the use of a questionnaire as the research instrument were analyzed with the aid of SPSS software and the results were presented in tabular form as shown in tables 1, 2, and 3 wherein the discussion starts with the objective of the study followed by the result and different positions of past studies.

The respondents' demographic status such as marital status, age bracket, educational qualifications, gender, and work experience were discussed in Table 1 to understand the characteristics of the respondents. It was evident that the selected banks for the study were dominated by male counterparts because 71% of the respondents were male. It also shows that majority of the respondents were married representing 67% which implies that out of 123 respondents 82 respondents were married and 90 respondents out of 123 respondents had a first degree among other qualifications representing 74% to signify that majority of the respondents were educated. The age bracket of the respondents shows that 36years – 45years has the highest percentage of 39% but could not be said to be in the majority, however, if it is linked to the age bracket 46years – 55yrs it can be said that the respondents of the study were made of young and relatively old respondents since retirement age in the study area was set at 60 years while the work experience of respondents on the majority side ranged between 6years and15years representing 70% i.e. out of 123 respondents, 86 of the respondents were not relatively new to the banking systems.

Objective 1: To identify the main job satisfaction components in the banking industry that drives job contentment in Nigeria

Table 1. Respondents' Demographic Information

Demographic variables	Respondents' Characteristics	Frequency Distribution	Percentage
Gender	Male	87	71%
	Female	36	29%
	Total	**123**	**100%**
Marital Status	Single	31	25%
	Married	82	67%
	Divorced	6	5%
	Widow	4	3%
	Total	**123**	**100%**
Educational Qualifications	ND/NCE	14	11%
	B.Sc./BA/B. ED/HND	56	46%
	M.Sc./MBA	34	28%
	Professional Membership	19	15%
	Total	**123**	**100%**
Age Bracket	Less than 25 years	16	13%
	25yrs – 35yrs	19	15%
	36yrs – 45yrs	48	39%
	46yrs – 55yrs	28	23%
	56yrs & above	**12**	10%
	Total	**123**	**100%**
Work experience	Less than 5 years	20	16%
	6yrs - 10yrs	36	29%
	11yrs - 15yrs	50	41%
	16yrs and above	17	14%
	Total	**123**	**100%**

Source: Survey 2022

Based on the literature reviewed, many components of job satisfaction were identified which seem to be relevant to what is obtainable in the Nigerian business environment although the sensitivity of the banking industry to the Nigerian economy accounted for variation in what was obtained in the industry through the distributed questionnaires. The underlisted variables were the outcomes of the information provided in respect of job satisfaction components with 80% occurrence in the filled questionnaires.

1. Job Security
2. Salary
3. Human Relations
4. Promotion
5. Organizational Benefits
6. Job Characteristics

Table 2 has descriptive statistics (mean and standard deviation) that was used to analyze data collected for objective 1 with deduction through ranking and the benchmark criterion for the decision was set for agreement at the weighted mean of ≥ 3.0 and that of disagreement was set at the weighted mean of ≤ 3.0. It shows that job security has the highest mean ($x̄ = 4.834$) and standard deviation ($\sigma = 1.228$), and the salary was ranked next to job security where the mean ($x̄ = 4.723$) and standard deviation ($\sigma = 1.601$) followed by

Table 2: Descriptive analysis of the main job satisfaction components in the banking industry driving job contentment

Variables	Mean	Standard Deviation	Ranking	Remark
Job security	4.834	1.601	1	A
Salary	4.723	1.228	2	A
Human Relations	3.234	1.652	6	A
Promotion	4.654	1.118	4	A
Organizational Benefits	4.711	1.290	3	A
Job Characteristics	3.401	1.210	5	A

Source: Field Survey, 2022
Remark, where Agreement (A) is ≥ 3.0 and Disagreement (D) is ≤ 3.0

organizational benefits where mean (x⬜ = 4.711) with standard deviation at (σ = 1.290) while next to this was a promotion with mean value (x⬜ = 4.654) and standard deviation (σ = 1.118), this was followed by job characteristics with a mean value (x⬜ = 3.401) and standard deviation was (σ = 1.210) and last on the list was human relations that has a mean value of (x⬜ = 3.234) with standard deviation (σ = 1.652).

To ascertain the degree of agreement among the respondents and the significance of this agreement, Kendall's W test of coefficient of concordance was employed as shown in Table 3

A comparative examination of Table 2 with Table 3 shows that the means of the variables were not the same and also a slight difference in the ranking. Table 2 still ranked job security highest followed by salary, and next to this was organizational benefits which were the same as the information in Table 2 although Kendall's W ranked job characteristics above promotion and that was the only visible difference between the two. However, the two analyses as presented met the decision benchmark criterion

that was set for agreement at a weighted mean of $\geq 3. 0$. Since Kendall's W is the coefficient of concordance measuring the degree of agreement among raters from 0 to 1 where 0 signifies no agreement and 1 signifies 100% agreement. Therefore, Kendall's W result has W = 0.758, X^2 = 198.241, Sig. = 0.000 to imply that the respondents agreed among themselves independently that all the six (6) variables identified as job satisfaction components were critical to the overall job contentment drive among the employees in the banking sector. Kendall's W value of 0.758 representing 76% of agreement along the continuum of 0 - 1 signified strong agreement and is considered to be significant among the respondents on the job satisfaction components towards the drive for employee job contentment.

Based on the results contained in Tables 2 and 3, objective 1 was said to be achieved which was about identifying the major components of job satisfaction driving employee job contentment in the Nigerian banking industry. the job satisfaction components identified in the banking industry as drivers of job contentment were job security, salary, human relations, promotion, organizational benefits, and job characteristics. This outcome further confirms he earlier work of Abiodun et al. (2013) and that of Begley and Czajka (1993) where

Table 3: Kendall's W Test and Mean Rank Statistics

Variable factors	N	Mean Rank	Kendall's W^a	Chi-Square (X^2)	Df	Asymp. Sig.	Rank Score
Job security	123	3.645	0.758	198.241	5	0.000	2
Salary	123	4.382					1
Human Relations	123	3.145					6
Promotion	123	3.177					5
Organizational Benefits	123	3.384					3
Job Characteristics	123	3.275					4

Source: Field Study, 2022
Kendall's Coefficient of Concordance

different variables were identified as major components of job satisfaction in the Nigerian business environment. The works of Berliana et al. (2018) considered job security and compensation to be among the significant variables in job satisfaction. Therefore, to drive job contentment among the employees in the banking industry, the focus should be on the six (6) job satisfaction components as identified i.e. job security, salary, human relations, promotion, organizational benefits, and job characteristics.

Objective 2: To investigate the relationship between job satisfaction components and job contentment

Table 4 has information on the correlational relationship concerning the existing relationship between job satisfaction components and

job contentment where the 'r' value was considered to have a weak correlation when it was between 0.1 to 0.4, a moderate correlation when the 'r' value was between 0.5 to 0. 6, and strong correlation exist when 'r' value was between 0.7 to 1. In all the cases, the value of 'r' was less than 0.7 for all the variables implying a positive correlation with a significant relationship between the variables with job contentment (job security, salary, human relations, promotion, organizational benefits, and job characteristics). The correlational result between job security and job contentment was $(r = 0.614, p < 0.01)$ which shows a positive and direct relationship to imply an increase in job security will also bring an increase in job contentment, it was, however, a moderate relationship. This was also the same for salary $(r = 0.686, p < 0.01)$, promotion $(r = 0.547, p < 0.05)$, organizational benefits $(r = 0.646,$

Table 4: Correctional Matrix of the Relationship between Job Satisfaction Components and Job Contentment

Variables	JS	S	HR	P	OB	JC	JC
Job Security (JS)	1.000						
Salary (S)	0.546*	1.000					
Human Relations (HR)	0.421**	0.325**	1.000				
Promotion (P)	0.369*	0.511*	0.221**	1.000			
Organizational Benefits (OB)	0.488*	0.522*	0.555**	0.444*	1.000		
Job Characteristics (JC)	0.463**	0.589*	0.337**	0.275*	0.453**	1.000	
Job Contentment (JC)	0.614*	0.686*	0.458**	0.547**	0.646**	0.543*	1.000

* Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

$p < 0.05$), and job characteristics ($r = 0.543$, $p < 0.01$) i.e. positive and direct relationship with moderate consequences while human relations ($r = 0.458$, $p < 0.05$) positive and direct relationship was considered to be weak in relationship consequences.

Based on the results in Table 4, objective 2 which sought to investigate the relationship between job satisfaction components and job contentment was said to be achieved. It was found that there exists a moderate and positive relationship among all the job satisfaction components variables except human relations which has a weak relationship with job contentment. This shows that an increase in employee job satisfaction components by whatsoever quantum will contribute positively towards employee job contentment in the long run which conforms with the works of Abebe and Markos (2016). This outcome of a positive relationship was supported by the earlier works of Tella et al. (2007) and Begley and Czajka (1993) but negated the degree of the relationship. The works of Tella et al. (2007) and Begley and Czajka (1993) placed a high premium on human relations in the course of driving job contentment through the job satisfaction components which was considered has been weak in the correlational analysis result for the banking industry. However, the earlier position of Ali and Wael (2017) corroborated the result of the study that there exists a relationship between job satisfaction variables and job commitment and the relationship is in the direction of commensurate attitudes toward job consequences while the position of Agbozo et al. (2017) lent support to this on account of the belief that the degree of employees' job satisfaction in the workplace will determine a lot of activities in the organization and job

contentment was among these job consequences. The work of Swaminathan and Jawahar (2013) also supported the result of this study that job contentment is a function of motivational tools evolving from job satisfaction to performance where gratifications are at the center i.e. the higher the level of gratifications enjoyed by employees, the higher the level of job contentment. However, Swaminathan and Jawahar (2013) linked job satisfaction to the resultant effect of motivational tools to explain the components that drive different dimensions of employees' feelings toward their jobs

The regression analysis in Table 5 was carried out to ascertain the impact and the extent of the significant relationship of the independent variables (job security, salary, human relations, promotion, organizational benefits, and job characteristics) on the dependent variable (employee job contentment)

From Table 5, the F values in the results indicated that the model was a good fit and significant. It showed the values of the adjusted R^2 of 0.252 and β of 0.302 for job characteristics indicated that there is a 25% variation in the employee job contentment as a result of the job characteristics while the beta value signifies that 30% of positive change occurs in the employee job contentment due to job characteristics. Hence, H_1 is proven to be valid that job characteristic has effect on employee job contentment. The result is consistent with Hackman and Lawler's (1971) and Hackman and Oldham's (1974) models where basic parameters of job characteristics were found to affect the psychological state of the employee, especially, motivation and contentment. This was also supported by McShane and Von Glinow (2018) where it was asserted that

Table 5: Regression Analysis of Independent and Dependent Variables of the Study

Variables Path	Adjusted R^2	F Value	Beta (β) Value	Sig. P Value
Job Characteristics Job contentment	0.252	266.223	0.302	0.004
Job Security Job contentment	0.512	297.611	0.664	0.000
Salary Job contentment	0.451	278.342	0.562	0.000
Human Relations Job contentment	0.067	221.490	0.191	0.002
Promotion Job contentment	0.163	292.514	0.275	0.000
Organizational Benefits Job contentment	0.366	256.953	0.421	0.000

employees with a higher level of these characteristics have a higher level of internal work motivation, work effectiveness, job satisfaction, and contentment. This result also corroborated Moorhead and Griffen (2008); Cascio (2003); Snell et al. (2010) that job characteristics influence the critical psychological states of employees in the workplace which often influences employees' personal and work outcomes based on the strength of the employee's growth needs. while Steyn and Vawda's (2014) position buttressed the outcome of this study that job characteristics are more often correlated with a job-specific behavioral outcome than with general work outcomes. The values of adjusted $R^2 = 0.512$ and $\beta = 0.416$ for job security to imply that 51% of the variation in employee job contentment is due to job security and the beta value indicated that 66% of positive change occurs in employee job contentment due to job security. Hence, H_2 is proven to be valid that job security has effect on employee job contentment. The outcomes of this study support the earlier work of Clark (2001)

that job security is largely the most important negative predictor of deviant behavior and that of Ogunbanjo (2021) that job security of employees at the workplace is a function of many variables caused by both internal and external factors of business organization with effect on organizational outcomes while the result of the study also supported Berliana et al. (2018) earlier position that job security is of paramount significance to employees.

The adjusted R^2 of 0.451 and β of 0.562 values for salary implies that 45% of the variation in employee job contentment was accounted for by salary while the beta accompanying value signifies that with 1 unit increase in salary at the workplace, there is an increase of 0.562 units in employee job contentment. Hence, H_3 is proved to be valid that salary has effect on employee job contentment. This result corroborates the position of Gerhart and Rynes (2003) and that of Hung-Wen and Mei-Chun (2014) that employees' salary satisfaction is synonymous with employee enthusiasm in the

workplace and outside the workplace while the result of the study also supported Berliana et al. (2018) earlier position that compensation in terms of salary is of paramount significance to employees. For human relations, the values of adjusted $R^2 = 0.067$ and $\beta = 0.191$ signifies that human relation has a 7% impact on employee job contentment and the beta value shows that 20% of positive change occurs in employee job contentment on account of human relations. Hence, H_4 is proved to be valid that human relation has effect on employee job contentment. The result corroborated the position of Tella et al. (2007) where human relations has been singled out among several reasons underlying employees' intention to quit their job on account of non-job contentment. The earlier work of Ali and Wael (2017) also supported the existence of a relationship between human relations and job contentment where human relation is said to be cost-effective in modeling employees' attitude, especially during a recession or depression when organizations could not meet some of the expectations of the employees while Berliana et al. (2018) linked work atmosphere of tranquility heralding peace and harmony to human relations.

Promotion values for adjusted $R^2 = 0.163$ and $\beta = 0.275$ imply that there is a 16% variation in the employee job contentment on account of promotion and the beta value indicated that for 1 unit increase in the promotion of employee in the workplace, there is a corresponding increase of 0.275 units in employee job contentment. Hence, H_5 is proven to be valid that promotion has effect on employee job contentment. The result of the study is consistent with the earlier work of Shields and Ward (2001) where it was asserted that employees that were dissatisfied with the available opportunities for promotion showed greater intention to leave the organization and those employees

that perceived available opportunities as golden chances for promotion, feel satisfied and willing to remain with the organization over a long period to actualize the promotion potentials. It also corroborated the positions of Abebe and Markos (2016) and Abiodun et al. (2013) that promotion is an integral part of employees' mobility decisions because of associated benefits while the outcomes of Gerhart and Rynes' (2003) work supported the result of this study that promotion has effect on employee job contentment which can be direct or inverse depending on the premium placed on promotion by the employees in the workplace. Lastly, the adjusted R^2 of 0.366 and β of 0.421 values for organizational benefits imply that 37% of the variation in employee job contentment was due to organizational benefits while the beta value showed that 42% of positive change occurs in employee job contentment due to organizational benefits. Hence, H6 is proved to be valid that organizational benefit has effect on employee job contentment. The result agreed with the earlier position of Abiodun et al. (2013) where job contentment was linked to a healthy work environment and that of Ali and Wael (2017) which asserted that job contentment emanated from the favorableness with which workers perceive their work environment in terms of technological opportunities and other accruing benefits in the work environment while Berliana et al. (2018) believed that a work atmosphere of tranquility where peace and harmony are prevalent is a good source of job contentment.

Conclusion

The study was based on the recent development in the banking industry where the rate of labor turnover has been on the rise in the last decade which was classified either as voluntary or involuntary although it was more of a voluntary decision. It was this development that led to the

examination of the employee job satisfaction components and job contentment using employees of the banking industry as the unit of analysis. Six (6) different components of job satisfaction were identified among the respondents who participated in the study such as job security, salary, and human relations as well as promotion, organizational benefits, and job characteristics. It was found that these job satisfaction components have a significant relationship with job contentment where job security and salary were given high premium recognition in the ranking among the components that drives employee job contentment although job security was considered to be more potent than others. It was also evident that there exist positive and moderate relationships among all the components of job satisfaction except human relations which has a weak relationship that pointed to the orientation of employees in the banking industry to revolve around bread butter issues i.e. financial consequential rewards. Therefore, for the obtainment of job contentment that can make employees remain and identify with a particular bank over a long period, these six components of job satisfaction should be entrenched in the organizational policies and strategies to guarantee job contentment among employees in the banking industry especially job security, salary, and organizational benefits without neglecting the other three components i.e. human relations, promotion, and job characteristics. In addition to this, the implementation of the organization's policies towards these components of job satisfaction should be seen to be fair, just, and free of any form of sentiment that can affect their perception and feelings about the components because job satisfaction is more of an emotional state and attitude.

The study has some limitations that were not limited to the scope of the study but to the research instrument, the study area, and the unit of analysis. The questionnaire was a self-administered survey instrument and, in this circumstance, did not take into consideration the emotions behind their responses on account of different interpretations, and perceptions, and interpreting emotions from data has always been somewhat tough. The study covered only the banks in Lagos Southwest of Nigeria which was made of 6 States although the majority of the banks were cited in the Southwest but would have been better if other regions were included to further enhance the generalization of the results of the study and the unit of analysis was service industry without recourse to other service or manufacturing industries. From the conclusion of the study, it can be deduced that money is crucial and fundamental in the course of driving employee job contentment through job security, salary, and organizational benefits. However, an organization operating under an economy that is at the peak of recession or depression will not be able to meet the financial expectations of the workforce. What should such an organization do to curb the effect on the workforce, and organization, and at the same time drive employee job contentment? This should be the future direction of research, especially in developing and underdeveloped countries where the economy is characterized by persistent inflation and unemployment leading to recession or depression.

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The nexus between technological financial innovation and financial performance of commercial banks in Zimbabwe

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Abstract

The paper examines the nexus between technological financial innovation and financial performance in banking sector. A positivist philosophical orientation approach guided this paper wherein an eight year quarterly panel data for a time period ranging from 2015 to 2021 for thirteen commercial banks in Zimbabwe was adopted for data collection. STATA software was used to analyse the impact of each dimension of technological financial innovation on commercial financial performance. The results showed that the use of automated teller machines and internet banking have strong positive relationship with financial performance, whilst a weak positive relationship was established between mobile banking and financial performance of commercial banks. Moreover, an insignificant association was established between electronic funds transfer and financial performance of commercial banks. The major implication was that banks should intensify the adoption of financial innovation as it enhances their operations.

Keywords:Commercial banks, financial performance, technological financial innovation, Zimbabwe.

Introduction

The major thrust of this paper was to determine the impact of technological financial innovation on financial performance of Commercial Banks in Zimbabwe. Akwam and Yua (2021) buttressed the notion that financial innovation has increased total income culminating in enhanced efficiency for Commercial Banks. This study therefore sought to determine the effect of technological financial innovation (internet banking, mobile, point of sale banking and electronic funds transfer banking) on the financial performance of Zimbabwean commercial banks. This study has been driven by a sharp decline in financial performance of commercial banks in Zimbabwe despite an upsurge in the adoption of technology driven banking models. Mabwai (2016) attest to the fact that tests on the effect of innovation on financial performance have been minimal and there is shallow knowledge on innovation drivers. Currently most commercial banks in Zimbabwe are reporting losses with only a few making profits, this is despite huge investments in digital banking platforms. Ideally, huge investments in digital banking should be met by improved financial performance (Mabwai, 2016). Zimbabwean Commercial Banks have adopted various technological initiatives like Whatsapp banking, Virtual Banking and online Chatbots

to mention but a few as a conduit for increasing mobile revenue. Partnerships with mobile platforms like Ecocash and Net one has been on the rise with most banks using Ecocash for Bank to wallet and wallet to bank transactions.

A global analysis of the banking industry reveals accelerated unsettledness and increased red ocean competition which has left banks no option but to innovate to remain in business according to Harelimana (2017). Khalil, Khawaja and Sarfraz (2022) explained the strategic importance of innovation as a tool to attain, competitive advantage for banks. Financial innovation affects financial performance, expansion and customer adoption in a positive way according to Hui and Xie (2018). Ibekwe (2021) further noted that that financial innovation has emerged as a key component of performance and competitiveness and is the primary driver of profitability. Twentieth century banks have made huge investment on technological financial innovation improving performance and market share. Harelimana (2017) explained that the financial terrain has changed with the advent of Fintech based innovation like ATM, internet banking and mobile banking. According to Huang et al. (2018), banks have adopted innovation with the objective of widening and deepening their revenue channels and the need to better survive clients with myriad of needs.

Huang et al. (2018) define financial innovation as a novel and new thing which assists to lower costs and risks and lead to an enhanced product that meets the needs of all financial sector stakeholders satisfactorily. Khraisha and Arthur (2018) explain financial innovation as an activity that culminates in the evolution and acceptance of new products and radically transformed processes and platforms. Isa-Olatinwo et al. (2022) alluded to the notion that performance is akin to productivity and efficiency of an institution putting emphasis on growth, bottom line, revenue and market share. Akyuz and Opsunju (2020) added that other parameters that can be used to measure performance are Return on Capital employed, competitiveness and survival. Santu, Mawanza and Muredzi (2017) expounded that performance is the major driver for organisational survival. According to Isa-Olatinwo et al. (2022), financial performance is the achievement of set financial goals for a firm. Goals are set at the start and performance will be compared with set standards at the end of the year.

ICT innovations in the form of Agency banking, mobile banking, internet banking and ATMs have transformed and revolutionised the financial sector. The leveraging of IT based technology in banking is known as financial innovation and has massively increased bank profitability according to Isa-Olatinwo et al. (2022). New delivery channels like agent and internet banking are now the buzzword and catchphrase of Zimbabwean commercial Banks with accelerated impact to reach the marginalised and rural population improving their lives. Radical transformation in the financial landscape coupled with globalisation and improved technology has liberalised the financial system with new and improved products being ushered in. According to Cainelli et al. (2019), this innovation through proliferation of new products and processes has impacted positively on financial performance.

Huge deployment and investment in innovative resources in innovative technologies have

been undertaken by Zimbabwe Commercial Banks. According to Reserve Bank of Zimbabwe Reports profitability for Commercial banks was USD 52.8 million in 2014, increased astronomically and reached a peak of USD 641 million by 2019 and fell to USD 342 million by 2020. Bank deposits fell from USD 4.4 billion in 2014 to a low figure of USD 2.08 billion by 2020. Total assets for commercial banks rose from USD 7.83 billion in 2015 to reach USD 60.64 billion in 2019. Electronic funds transfers, internet banking, POS and Mobile banking increased significantly with a 2020 RBZ report showing that there were 10.7 million transaction valued at 1.56 trillion Zimbabwean dollars which were processed in 2020.

There has been marked increased in the innovative technology by commercial Banks in Zimbabwe which has had varying effects on bottom-line. The correlation between huge and accelerated investment in technology (financial innovation) and financial performance needs an in depth study in Zimbabwe. Has the investment paid off or not is a paradox that needs unravelling which is the crux of this study?

Zimbabwean commercial banks have adopted various technological innovation initiatives which have seen tremendous impact on return on assets. A trend analysis on the return on assets for Zimbabwe commercial banks shows an upward trajectory with the ROA figure for all banks being 2.11 % in 2015 and reaching a massive peak of 12.04 % by the end of 2017 (Santu et al., 2017). This shows a significant improvement in terms of use bank assets. The trend has been attributed to investment in technology and greater use and adoption of digital channels by the banking public.

According to RBZ Annual reports (2015-2021), internet banking users increased six fold from 108 662 in 2015 to reach 607 246 users by 2021. Electronic funds transfer values increased by astronomic proportions for the period under review to reach a massive figure of ZW177 billion by 2021. The period also witnessed a jump in internet banking users with a third of the population being registered on Internet banking platforms as indicated by the 4.2 million users on internet banking at the end of 2021. Figure 1 shows the trend in ROA for the period 2015-2021.

DeYoung et al. (2018) alluded to the fact that bank profitability hinges upon the institutions income and expenses. There alluded to the fact that there is a positive correlation between innovation and profitability which is necessitated by cut throat competition among banks. Banks need to develop new products and technologies to stay ahead of the pack in their quest to increase financial stamina and financial performance. The adoption of financial innovation has had mixed results on commercial Financial performance with some banks improving in profitability while others suffering losses. The major thrust was to dig deep into the issue and provide insight into the impact of financial innovation on financial performance and seek to provide answers on why others have failed even after investment in technology.

Literature review

The strategic role of technological innovation in the twenty first century for the banking industry need not be over emphasised. What spurs economic growth is patronising   new clients   and   enhancing   firm- performance

Figure1   Trend in ROA 2011-2021

ROA
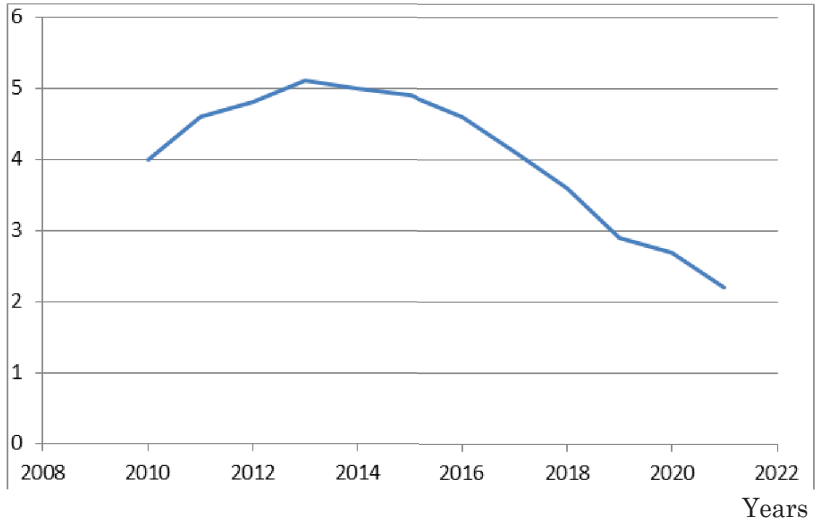
Source: RBZ Bank Supervisory Report 2021

according to Ongore and Kusa (2013). Khrawish (2011) explained that innovation provides numerous benefits and financial institutions need to lurch to the industry 4.0 initiative to increase profitability technological financial innovation can be categorised into product, process and institutional innovation. Financial product innovation entails the introduction of new and improved financial products like bank assurance, leasing and credit cards to mention a few. Financial process innovation entails the ushering in of new business processes culminating efficiency and greater market reach. Examples include client customer relationship and data systems, increased use of online systems and automating of bank processes. Technological financial system innovation encapsulates structural system changes and transformation of the whole financial intermediary field.

Theoretical framework

Silber's constraint theory of innovation

It was coined by Silber (1983) with the sole objective of offering a description of why firms undertake innovation. According to the theory, innovation is undertaken to improve bottom-line through seamless financial service delivery. Financial institutions have internal and external constraints and the aim of technology innovation is to ameliorate and circumvent these internal and external challenges. The constraints encompass external limitations like government policy and internal impediments like organisation management. Technology exploitation will improve efficiency and culminate in increased profitability by eliminating unnecessary costs. Innovation is beneficial in

two ways as it is a means to save costs and simultaneously acts as an excellent tool for marketing. Firms that innovate will always stay ahead of the pack and perform better than those that do not innovation. There are three possible forms of innovation which encompass internalising a remote balance sheet item, financial instrument ushering from another country or a mixture of the two in the context of transforming an existing instrument. Literature has revealed that institutions that have low profitability are not very innovative. The cutthroat competition and regulation will compel these firms to innovate to increase efficiency. Silber (1983) alluded to the fact innovation investment is a response to a competitive position that is not advantageous and the model explains about 60% of all innovations that have taken place. The theory is important as it elucidates on the notion that innovation leads to higher profitability. The relevance to the study is that financial institutions undertake various technological financial innovations and in this context they have various impediments and constraints. The theory reveals how these constraints can have an impact on profitability and how firms can circumvent such impediments.

Schumpeter theory of innovation

Schumpeter ushered in the concept of entrepreneurs who undertake investment and research to accelerate profitable opportunities. As a consequence of the opportunities, imitators would enter the market to eat a part of the market share and erode the profit. According to the theory, Kondratiev cycles would set in as a consequence of disequilibrium and the cycle will start over again. In other words, the innovation theory of profit proposes that an entrepreneur's primary responsibility is to create innovations, and that he receives compensation for his efforts in the form of profit. A further point he made was that it is entrepreneurship that "replaces today's Pareto optimal with tomorrow's different new thing." Today, when modern capitalism is going through a significant crisis and has lost some of its lustre due to the recent subprime and euro-debt crises, Schumpeter's statement that "entrepreneurship is innovation" has never felt more pertinent. Schumpeter demonstrated the correlation between financial innovations and accelerated entrepreneurial growth which leads to profitability. Commercial banks need to take heed of continuous innovations that are taking place and need to embrace various innovations simultaneously to boost profitability. A good example is the simultaneous adoption of mobile banking, Agency banking and Internet banking by Zimbabwean commercial banks. It is imperative to note that innovation increases profits but has a downside in the context of exponential risk increases. Firms should have adequate risk mitigatory measures to counteract the risk posed by innovation.

The theory is relevant to the study as it shows the link between innovation and financial performance through entrepreneurship. It buttresses the stance that innovation is important as it improves a firm's financial performance by making it competitive on the financial terrain. Excellent competitiveness coupled with accelerated innovation would ensure that the firm stays ahead of the pack and remains competitive for the foreseeable future.

Transaction cost innovation theory

The main pioneer is Niehans (1983). According

to this theory, the major factor for adopting financial innovation is to reduce transaction costs. This transaction cost reduction will accelerate financial innovation and improve provision of financial services. The far reaching objective of innovation is the institute's aim of earning profits. The theory used the link between financial innovation and performance from a transaction's stance. Transaction cost reduction as a consequence of financial innovation will lead to improvement in financial performance. The reply to advancement in technology is the powerful force for financial innovation which lowers costs. Cost effective innovations like the use of debit and credit cards for payments, Magnetic Ink Character Recognition (MICR) line in processing cheques, Internet and Mobile banking will increase profitability for banks. Transaction costs play a paramount in the context of innovation as the downstream effects of financial innovation is to drastically reduce costs. The use of ICT drastically reduces bank costs as it provides offsite connection to bank database and lowers costs. Cost containment is one of the major objective and metric for Retail Banking Managers to achieve. The relevance of this theory is that it shows the nexus between financial innovation and performance through cost containment. In this regard, financial innovation leads to lower transaction costs which have a transmission mechanism of increasing bottom-line.

Disruptive innovation theory

Pioneered by Christensen (2006) describes a process where a service takes incremental applications and grows through the market ranks eliminating rivals. Success by firms is facilitated by consistent and continuous innovation of products culminating in strong competitive advantage. Profitability is increased by charging premium price for consumers as disruptive innovation allows access to sophisticated products by all customers that were only the preserve of premium customers. Disruptive businesses are characterised by niche markets, lower profits and inferior products which are unattractive to existing products. This unattractiveness is not good for established firms but is a good market for disruptors. The theory is relevant as it shows how disruptive innovation undertaken by financial players increase profitability. The advent of Chatbots, Unstructured supplementary service data (USSD) banking and Whatsapp banking was a result of disruptive innovation in an effort to increase profits for commercial Banks.

Financial innovation and financial performance

Sujud and Hashem (2017) studied the impact of innovation on the financial performance of banks in Lebanon. Structured questionnaires were used for data collection and SPSS was used to analyse the data. Their variables were POS, EFT, Debit and Credit cards and ATM. The results showed a positive and significant between return on Assets and the independent variables. It was concluded that bank innovation boosts profitability for Lebanese Banks. Gichungu and Oloko (2015) investigated the impact of innovation on the performance of Banks in Kenya. The study focussed on the effect of E banking on efficiency ratio of banks and a total of 23 Banks for the period 2007 to 2016 was used. Secondary data was collected from the State Bank of Pakistan and the data was analysed using the E Views Statistical

package. Efficiency ratio was the dependent variable and the independent variable was MB (mobile banking), POS (point of sale), IB (internet banking) and ATM (automated teller machines) transactions. The results show that there was a significant and positive relationship between efficiency and IB. The results were non-significant for MB, POS and ATM. When granger causality was applied, there was no correlation between the variables. They advocated more investment in POS and ATM as they reduce operating expenses. Proper and effective use of IB and MB should be maintained rather than investing in more of these platforms. Hu & Xie (2018) focussed on the effect of financial innovation on the performance of Japanese Commercial Banks. They adopted Log method and panel regression analysis. Their study revealed that innovation increases bottom line and banks should innovate to survive and increase profitability. Mutahar et al. (2018) reached the same conclusion when analysed banking institutions in Yemen. A questionnaire was used and snow ball sampling was adopted. Structural equation modelling was used and data was analysed using Analysis of moment Structures Software and SPSS. Waiganjo (2018) on the effect of mobile banking services and profitability concluded that as the number of mobile banking users increases, profitability also increases in that respect. Structured questionnaires targeting six banks with a sample of 190 was used to collect primary data. Secondary data was obtained from Annual Bank statements for Kenyan Banks for the period 2013 to 2017 and multiple regression analysis was used to analyse the data. Financial performance was proxied by ROA (return on asset) and the independent variables were value of MB transactions and number of MB users.

Yao et al. (2018) did a Chinese study to determine how investment and adoption of payment technology affects financial performance. The period under consideration was 2007 to 2014 and a vector model which applies auto regression techniques was adopted. Data was obtained from a most credible source which is the China Stock Market dealing with research. independent variable was Third Party payments which encompass all payments related to the use of mobile and internet banking. The dependent variable was average economic value added per share which was used as a proxy for profitability (financial performance). The results showed that third party payments affect profitability of institutions in the short run and in the long run they have a positive effect on the whole industry by contributing to synergy in the service sector. The study recommended cooperation among all stakeholders in the payment structure spectrum. Gayathri and Suvitha (2018) study show how Indian Banks are affected by information technology. Time series data for the period 2011 to 2015 for 21 banks was used which consisted of 12 national banks with the other nine being private. Profit after tax was used as a measure of performance and the independent variables encompassed expenses related to Information technology, salary, depreciation, printing and marketing and distribution related expenses. The study revealed that investment in information technology and marketing has a positive impact on profitability with Information technology having the strongest effect of them. They recommended that financial institutions should invest more in technology and government should create an enabling environment for firms to be encouraged to invest. Guided by studies and key theories informing this study the researchers proposed the conceptual frame

Figure 2: Research model
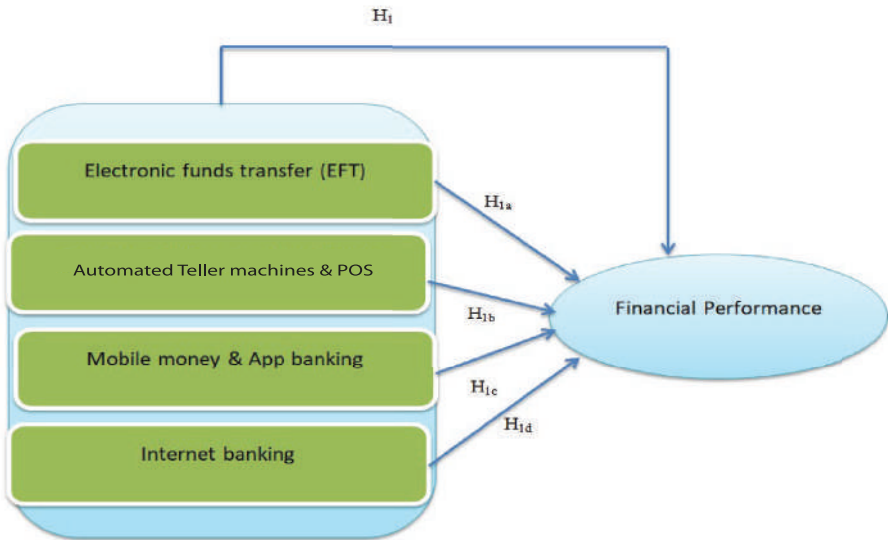
Source: Researchers (2022)

work presented in figure 2 below with four sub-hypotheses.

Research Gap

Innovation and its expected effect on financial of commercial banks are limited especially in least developed economies like Zimbabwe. Studies by Waiganjo (2018) although coming closer to the current work as it explores the subject financial innovation (in general) and commercial bank performance used a qualitative cum quantitative approach through use of close ended questionnaires by using Analysis of Moment Structures (AMOS) extension module of SPSS to measures the direct effects between financial innovation and commercial bank performance. The current paper uses purely quantitative data on technological financial innovation parameters as related to commercial bank financial performance which is a departure to Waiganjo (2018). The paper is also unique to Zu et al. (2019), Wadesango and Magaya (2020) whose studies focused on commercial bank performance which may capture other performance indicators other than financial performance and focuses on technological financial innovation rather than innovations in general and its effect on financial performance as opposed to general bank performancer and adopts a narrow and specific view to innovation as it pertains to financial performance of commercial banks.

Methodology

The paper is guided by a positivist philosophical orientation which focuses on testing hypotheses as guided by hypothetico-deductive methodology. The paper focuses on causal

effects between variables in order to test whether there exist nexus between financial innovation and commercial financial performance in Zimbabwe. Secondary panel data on proxy variables for different technological financial innovations and performance indicators were collected and analysed using Stata package from thirteen commercial banks. The commercial banks studied were CBZ bank, FBC bank, ZB Bank, Eco bank, Steward bank, POSB, First capital bank, AFC bank, Banc ABC, NMB, Standard Chartered bank, Stanbic bank and Nedbank. The researchers collected data on ROA, IB, MB, ATM AND EFT on the seven year quarterly data.

Variable description

The panel data multiple regression model used in this paper adopted five variables, being proxy measures for the independent variables and one being the dependent variables. The method had been used by Akwam and Yua (2021) and Ibekwe (2021) though their focus was not on technological financial innovation. Table 1 presents the variables and the operationalisation of such variables.

All the five proxy variables were ratio scaled thus allowing such panel data to be modelled together without challenges.

Results

Descriptive statistics results

Descriptive statistics focuses on mean, maximum, minimum and standard deviation of the variables by providing a contextual analysis of the data. According to Hussey and Hussey (1997), it provides a picture of the major features and physiognomy of the variables

under consideration. It is imperative as it puts into perspective, dispersion, distribution and central tendency measure of the data. Descriptive statistics summary outcomes are presented shown in Table 2 as derived and extrapolated by the data used in the study.

According to Table 2, the mean ROA was 9.18654 with a standard deviation of 5.547874, the minimum was -6.9 and the maximum ROA was 19. From this we can interpret that performance of Commercial Banks during the period was low as witnessed by the fact that some banks were in a loss making position during the period. The performance, although low, it is positive which is commendable since it shows significant and considerable profits being made. ATM had a mean of 17.6, a standard deviation of 0.81, and minimum value of 0.08 and a maximum of 98 which shows that ATM use was growing over the period under review. The results show lower means, standard deviation maximums and minimums for EFT, IB and MB. This points to the notion that usage of these technological innovation devices was low and banks need to do more to educate and acclimatize clients on the need to adopt these technological innovation tools. It is good to have technological innovation tools but it is imperative that clients are quickly on-boarded and encouraged to use these tools.

Robustness check

Heteroscedasticity test

To test for Heteroscedasticity, we undertook tests through the Breusch Pagan- Godfrey test. We obtained a p-value of 0.8193 which is greater than 0.05 concluding that the model was homoscedastic and as per norm, we reject the alternative hypotheses.

Table 1 Variables operationalisation

Variable	Meaning	Dependent / independent	Measurement	Studies	Scale
Yi	Financial performance which is a measure of the comprehensive income over time	Dependent	Return on Assets	Akwam and Yua (2021)	ratio
ATM	Automated teller machines (ATM) are Machine that offers banking services electronically by dispensing cash via a card system	Independent	Investment in ATM over time, in relation to annual expenditure	Ibekwe (2021)	ratio
IB	Internet Banking (IB) which involves transfer of funds using electronic means via the internet	Independent	Investment in Internet banking over time	Lasmini et al., 2020	ratio
MB	Mobile banking (MB) which involves transacting using mobile phone	Independent	Investment in mobile banking over time	Akani and Obiosa (2020)	ratio
EFT	(EFT) Electronic funds transfer through POS	Independent	Investment in EFT platforms over time	Zu et al.,2019	ratio

Table 2 Summary results of descriptive statistics

Variable	Observations	Mean	Std dev	Minimum	maximum
ROA	91	9.18654	5.547874	-6.9	19
ATM	91	17.61949	0.8145373	0.07	98
EFT	91	19.75574	4.871968	18.08	20.85
IB	91	34.353673	5.93446	0.6	76.7
MB	91	7.39647	4.381332	3.4	17.5

Homoscedasticity entails that variances are constant among the error terms (Gujarati & Porter, 2004). The table 3 illustrates the results. There was no issue with heteroscedasticity because the data reveal constant variances among the variables.

Table 3: Test results for heteroscedasticity

Chi-2(1)	Prob> chi 2
0.08	0.8193

Hausman specification test results

This test was conducted to make a choice between the fixed effects model or the random effects model. H0 was for the random effects model while H1 was opting for the fixed effects model.The decision criterion was stanched towards the random effects model as the p (0.1267) value is greater than 0.05. Table 4 shows the test results.

Table 4: Test results for hausman specification

Chi-2(6)	Prob> chi 2
11.41	0.1267

Results of panel unit root test

Unit root test was performed by applying the Levin-Linchu Test. The data was skewed towards the alternative hypotheses as the condition of stationarity. According to Table 5's findings, all variables were stationary at level I (0). Result shows that the data was integrated of the first order for the predictors which were used in the analysis of the data.

For stationarity to exist under panel unit root

test under a one tailed test criterion, the *p* value should have a value less than 0.1. From the results presented, the P values are all less than 0.1 and the integration were of the order zero for all variables. Thus the conclusion is rejection of H0 and all variables are considered to be stationary. The interpretation is that the variables are co integrated and they move in

tandem with each other. In such instances, variable equilibrium and consistency in the long-run is established.

Multicollinearity test results

The correlation matrix was adopted to check whether the model exhibits characteristics of strong and severe multicollinearity or the opposite is also true. Table 6 shows the results obtained from the correlation matrix will ensure that the regressors do not have a relationship within

themselves which would make the model suspect.

From the table presented above, it is revealed that all the correlation matrix figures and coefficients are below the threshold of 0.8 and therefore we can safely deduce that the model did not suffer from severe and austere multicollinearity. This implies that the estimated coefficients are precise and the statistical power of the regression model is enhanced which makes the model robust. In this regard, we can trust with absoluteness the P-values to determine the

Table 5 results of unit root test

Innovation modes	t-distribution stats	p-distribution stats	Intergration order
ROA	-4.7643	0.0001	I(O)
ATM	-20.5604	<0.0001	I(O)
EFT	-13.0654	<0.0001	I(O)
IB	-5.4793	<0.0001	I(O)
MB	-4.0828	0.0033	I(O)

Table 6: Correlation matrix

	ROA	ATM	EFT	IB	MB
ROA	1.000000	-0354279	0.208870	0.059027	0.500997
ATM	-0.354279	1.000000	0.132066	0.123543	-0.270292
EFT	0.208870	0.132066	0.084936	0.084936	0.247042
IB	0.059027	0.123543	0.084936	1.000000	0.137202
MB	0.500997	-0.270292	0.24702	0.137202	1.000000

statistically significant independent variables. This will ensure we have a correctly specified model.

Results presentation, interpretation and analysis

The regression was carried using Stata statistical package after all the diagnostic tests had been done and data abnormalies have been regularized. The approach adopted to determine significance was the common P value approach with the null hypotheses being coefficient is not statistically significant and the alternative being coefficient is statistically significant. If a p Value is greater than 0.05, the variable is statistically significant and the null hypotheses is dropped. Table 7 reveals the panel regression results.

ROA = 0.32MB + 0.93IB + 0.86ATM - 17.28
Equation 1

R^2	**= 0.8226**
Adjusted R^2	**= 0.7993**
F(6,84)	**=25.62**
Root MS	**=5.5538**

The model`s explanatory power is denoted by the adjusted R^2 which is given as 0.7993 (0.8), this means that 80% of variability in commercial banks financial performance is explained by different technological financial innovations as captured by the model and the remainder 20% is explained by factors outside the model. This is a significantly higher explanatory power as it is way above 60% which was recommended by Gujarati and Porter (2004). The root MSE of 5.56 measures the standard deviation of residuals. Given that it is small, it means that the model can be relied upon as the variability residual is small. Of the four proxies of technological financial innovations only one (Electronic funds transfer) was found to be not statistically significant in explaining variabili ty

Table 7: Panel regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob
ATM	0.86481	0.7991431	2.96	0.004
EFT	0.64158	0.7052371	1.56	0.129
IB	0.93572	0.804811	2.89	0.006
MB	0.3229294	0.0815643	3.95	0.002
CONS	-17.27562	3.499499	-4.94	0.001

in financial performance of commercial banks in Zimbabwe as its probability value was found to be greater than 0.05 (0.129). Use of point of sale/ Automated teller machines was found to be positively related to financial performance of banks as a 10% improvement in the technology is associated with an 8.6% increase in financial performance of commercial banks in Zimbabwe as reflected by a beta coefficient of 0.86. Similarly, a beta coefficient of 0.935 for internet banking imply a very strong positive association with financial performance of banks as a 10% change in investment in internet banking will be met by a massive 9% increase in financial performance. However, a weak positive association was established between use of mobile banking (whatsapp, SMS, app banking) given a beta of 0.32, as a 10% increase in investment in mobile banking is likely going to be met by a 3% increase in financial performance of commercial banks in Zimbabwe.

Discussion of results

The positive association between mobile banking and financial performance dovetails with other studies that were undertaken before. Akwam and Yua (2021) in their Nigerian study on the effect of financial innovation on

financial performance concluded that the mobile banking was significant and showed a positive relationship with Return on Assets. This was also buttressed by Torki et al. (2020) in their Islamic study whose result pointed to the same result though the results differ on strength of association. In Zimbabwe the weak association can be explained by high charges by mobile money companies as well as tax on electronic transfers.

On another note, the positive relationship between internet banking and financial performance is in line with studies by Lasmini et al. (2020) who found a positive relationship between internet banking and ROA. However, the current study established a very strong positive relationship with financial performance which represents a departure from Lasmini et al. (2020). Nwobodo (2011) in his study of Turkish banks concluded that banks which had internet banking platforms performed better than those that were not on those platforms. From a Zimbabwean perspective banks are charging one percent internet fee commission on the amount transacted which is adding significantly to profitability which justifies the current results. This goes a long way to show how this revenue source contributes significantly to bank profits. Most banks in Zimbabwe have been advocating for a paper

less office through elimination of manual transfers through their digital transformation thrusts. Through straight through process, transfers which previously took two days to credit now only take a few hours. This has improved confidence in the transacting public especially corporates who move huge funds every-day and would want a seamless and efficient process that will ensure service providers are paid in time.

The results are in line with the same conclusion reached by Nwakoby et al. (2020), in his Nigerian study revealed a positive relationship between POS and bank profits. However, the results contradict Nwobodo (2011) whose findings revealed that POS was insignificant in explaining bank profits. Zimbabwe is unique in that due to high inflation rate, and continuous loss of value of the local currency, most clients now prefer to use POS as the model is convenient.

Conclusions, implications limitations and future research suggestions

The millennial clients are techno savvy and the demand for technology in the banking sphere has taken an upward trajectory and hence banks need to redesign products and services to cater for these needs. Banks in Zimbabwe have taken significant strides with the advent of Chatbots, WhatsApp Banking and Virtual Banking to mention but a few of the technologies being adopted by Banks. Digital only banks known as Neo Banks are fast replacing traditional banks, Artificial intelligence, application programme interfaces, block chain technologies and internet of things need to be embraced by local banks as these will go a long way in addressing not only clients' needs but also profit goal of banks. In this regard, it is imperative that Commercial Banks in Zimbabwe latch into this bandwagon as technology is fast gravitating to these technologies by 2025. This will go a long way in increasing income and accelerate profit generation potential.

There is need to acquaint customers with digital products since most of the population in Zimbabwe are not well versed with technology and bank applications. First time customers can take part in digital competitions where prizes can be won. This will increase digital awareness and increase mobile revenue income for banks. We recommend that Banks should partner with Government to penetrate rural areas to introduce digital technologies. The Government rural computerization programme can see banks donating computers, electrifying schools and create internet Kiosk through partnership with government. The technological thrust has been mostly in urban areas and hence penetrating the rural areas would see more digital on boarding of clients. Banks could take this opportunity to educate clients in the rural areas about digital banking by creating digital innovation centers in those remote and marginalized areas.

Slow uptake of digital technologies by the Banking clients has had to do with lax cyber security by banks, weak consumer protection laws that trample on financial integrity and transparency, and unsatisfactory grievance resolution which led to lack of trust by the banking public. Banks and the government need to invest massively in this area to address low uptake of new models of banking.

Limitations and future research suggestions

This paper explored the nexus between technological financial innovations and financial

performance of commercial banks in Zimbabwe, thus its application is limited to the commercial banks. This therefore means that future studies can be explored in building societies, finance houses. This nexus can also be explored using categorical dimensions as proxy measures using structural equation modeling. Commercial bank financial performance can also be pursued from use of other digital technologies such as block chain technologies, cloud computing and 3D technologies. These fourth industrial revolution technologies can be explored in the context of financial institutions.

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Corporate social responsibility practices impact on company performance across Bulgarian SMEs in the automotive sector

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Abstract

The relationship between CSR practices and the firm performance across automotive SMEs in Bulgaria the paper suggests that development and implementation of CSR measures is critical for the success of the SMEs across the emerging automotive sector in this EU country. The study aims at broadening knowledge at Corporate Social Responsibility literature in the context of SMEs business domain. The study represents quantitative analysis on CSR measures based on the ESG goals set by the United Nations. The collected data in the paper are secondary and it has been collected from the Bulgarian Statistical Institute, the Union of the Automobile Industry in Bulgaria and individual companies' websites. Additional data have been gathered from the Automotive SMEs' annual reports of the companies as well. The paper empirical data findings for the period 2018-2020 show that Automotive SMEs have been adopting westernized best practices on CSR, which positively affect their performance and prosperity.

Keywords: Automobile Industry, CSR practices, SMEs, Bulgaria,

Introduction

The global automotive industry is experiencing one of the most turbulent stages of its renewal. Some of the changes are external to the industry - changes in society, in lifestyle. Others are related to ensuring sustainable growth in line with significant climate change (Hoeft, 2021). The internal challenges for the industry are related to technical and technological announcement. The speed of industrialization follows the speed with which scientific innovations are created. This affects key areas such as propulsion systems, electronic control of vehicle processes, car connectivity and its integration into traffic and communication systems, driver relief, creating conditions for greater autonomy of the car with predictable behavior in traffic.

It is obvious that car companies have been investing in development activities that are not specific to the classic car industry, whether it is carried out in the companies themselves, or the developments are acquired on the open market by technology companies outside the industry

(Pavlinek, 2018). In the medium term, global car production and new car sales will continue to grow. This growth will undoubtedly be linked to the need created by regulators to renew the car fleet based on sustainable and environmentally friendly propulsion systems. In 2020, this trend is not confirmed. Globally, the forecasts are for a decline in sales by about 18%, with a significant difference in the dynamics of individual regions. For the first 11 months of the year in Central and Eastern Europe, the common market decreased by 25.8% compared to November 2020 and 13.5% in the premium segment (Velinov & Bradáč, 2020). According to HIS POLK institute in Bulgaria the decline is 33.2%, in the premium segment - 28%. Naturally, the first and main factor for this is the decline in demand. It is related to measures to limit the COVID pandemic and reduced consumer confidence. In addition, a significant factor is the limitation or suspension of the production process in the world's automobile plants, as well as the difficulties in the functioning of the logistics system. The second wave of the pandemic leads to an additional downward adjustment of the forecast values. Although the general framework conditions for the development of the automotive industry will maintain the dynamics of the automotive market in 2021, it will be directly dependent on overcoming the medical dimensions of the pandemic and limiting the socio-economic consequences associated with it (Pichler et al., 2021). The maturity of society for the implementation of measures for social distance and the speed and scope of vaccination are extremely important. Also, the topic of Corporate Social Responsibility (CSR) has been emerging across the automotive firms in Bulgaria coming from the Western markets, but it was hit heavily by the global pandemic,

which significantly slashed the companies' budget stipulated for CSR activities (Wolff et al., 2020). Thus, it imminently affects negatively the development and implementation of CSR best practices across the automotive firms in Bulgaria.

The important role of the automotive industry for the country's economy, which is responsible for 11% of gross domestic product. Given the development of cars to digital technologies, Bulgaria can offer a wide base of IT specialists. There is great interest from companies that are willing to expand their business on the Bulgarian market. Not only car companies, but also about technology companies related to the automotive industry are expressing interest in investing into Bulgarian market. The automotive industry enables local companies to become part of its supply chains in the long run As the pandemic has been evolving, a number of business and social issues arise that need to be addressed, such as ensuring a safe working environment (social and environmental), optimizing supply chains (economic and logistic) and switching suppliers (economic & logistic).

Literature review

According to institutional theory, organizations are susceptible to various pressures which expedite isomorphism in organizational practices and routines (DiMaggio & Powell 1983). The theory holds that organizations that share the same environment will employ similar practices in response to institutional pressures to survive. Accordingly, we understand institutions as supra-individual social entities that cause social as well as organisational phenomena, which cannot be directly

ascribed to individual attributes or actions but to external controls on individual and organizational behaviour. Social institutions in a given country, therefore, influence organisational behaviour through a combination of cultural-cognitive, normative, and regulative factors. Although CSR initiatives have become common among emerging market companies (Velinov, 2017), literature suggests that emerging market CSR is different compared to developed markets, reflecting their specific social and political background. Due to those differences, CSR scholars are faced with the challenge to determine what factors influence CSR in firms from emerging economies. In particular, several studies have researched CSR in CEE, such as Skypalová and Kučerová (2014), checking dependence between the knowledge of the concept of CSR and its application in practice, examining CSR strategies of banks and their effects on customer and employee satisfaction as well as on loyalty. However, only very few studies have explored the relationship between firm performance and CSR in CEE more in depth.

Since the institutional environment is specific to a nation, organizational practices usually vary across countries. With respect to CSR, Campbell (2012) found that the relationship between basic economic conditions and corporate social behaviour is mediated by institutional conditions. While knowledge on CSR in developed Western markets is abundant, the status of CSR in emerging markets is gaining al., and more relevance e.g., (Jindra et al. 2019). More concretely, the political, cultural, normative, and legal frameworks in Central and Eastern Europe (CEE) and those in Western Europe have remarkably differed for several decades given their affiliation to opposing political blocks. Those differences can be expected to manifest in today's institutional environments and, consequently, to affect organisational phenomena. In recent years, though, due to the accession of many CEE countries to the European Union, an economic and legal harmonization with respect to EU laws and standards and business settings could also be observed across CEE (Sageder & Feldbauer-Durstmüller, 2019).

One of the complex studies, Činčalová and Hedija (2020) examined the relationships between CSR, firm age, firm financial performance, firm size and gender diversity of boards. They described the relationship between firm size, firm financial performance, and CSR practice of firms, but according to them, firm age and gender diversity of boards are not the factors affecting the CSR practice. Another study by Chang et al., (2017) controlled for company age, firm size, return on assets, CEO change, average age of board members, board size, outside director ownership, managerial ownership, and industry dummy variable. Their findings suggest that there is no universal feature of CSR-supportive board characteristics due to the unique characteristics of various institutional contexts. The findings by Yaseen et al., (2019) revealed that board diversity measured by gender is positively related to CSR performance. Moreover, after controlling CEO age and board characteristics, this study found supporting evidence for a positive association between board diversity and CSR.

Methodology

For the purpose of the study, we have studied sample of 50 firms from automotive sector in Bulgaria for year 2021 by their size. Then we

selected the top 5 among them ranked by firm performance. The study research model is based on CSR practices that are measured by five items (environment, human rights and labour, product responsibility, society) inspired by the content of the Global Reporting Initiative (GRI) guidelines. This method is adopted from Godos-Diez et al. (2020). As in the both above mentioned studies, we considered each item through dummy variables, in which a value of 1 was given if the company meets the item requirements and a value 0 if not. We have taken the ISO 9001, ISO 14001 and ISO 45001 as references since these standards imply the firm's compliance with environmental, human labour and quality regulations (Gallego-Álvarez et al., 2011). The ISO 9001 and ISO 14001 certifications guarantee the products or services and respect for the environment (Godos-Diez et al., 2020). The existence of a code of ethics emphasises the importance of moral and ethical principles that everyone in the organisation must respect. By preparing a CSR report, a company expresses its interest in publicly informing about relations maintained with all types of stakeholders and the actions taken with regard to the environment and the community.

Results and Discussion

Bulgaria has a number of advantages over many other countries in terms of attracting foreign investors against the background of the transformation of the global automotive industry - a process that affects both industry and business in general in Bulgaria (see Figure 1). The car industry in Bulgaria: a successful example of production and investor interests in Bulgarian Automotive Cluster. According to big 4 consultancy firms, Bulgaria is in the Top 10 countries with the fastest Internet in the world, leading the ranking in the number of mathematicians. Furthermore, Bulgaria is third in the world in the number of qualified IT specialists per capita. At the same time, 49.5% of the population speaks at least one foreign language along with the fact that Bulgaria has a relatively relaxed tax system, which is good news for investors from abroad.

The automotive sector (see Figure 2) in Bulgaria boasts 67,735 people employed across 270 companies, as the majority of them are foreign-owned firms. A total of 270 companies operate in this sector in Bulgaria, with an annual turnover of 4.3 billion euros. About 90% of cars in Europe have parts made in Bulgaria. At the same time, 80% of car sensors in cars sold in Europe are built in Bulgaria.

Table 1 depicts how the top 5 automotive firms in Bulgaria have been performing in year 2020, during the global pandemic. We can observe that these five firms have been performing good beside the biggest automotive firm Yaazaki Bulgaria due to its digital and strategical reforms. However, these five companies have implemented higher number of CSR practices than their counterparts.

Clear for all those who operate on the Bulgarian car market or analyze its condition, is the trend of aging. Of particular concern is the fact that institutions and society are unable to find the right approach to reduce the obsolete, technically defective fleet and begin its replacement with modern, environmentally friendly, modern cars. The problem is the social cost of such steps and the lack of sufficient will for sustainable solutions, such as those applied in some of the Central and Eastern European countries with a similar history to Bulgaria.

Figure 1: Automotive sector in Bulgaria
Source: Bulgarian Investment Agency, 2021

Figure 2: Automotive map of Bulgaria
Source: Bulgarian Automotive Cluster, 2021

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Table 1: Top 5 automotive firms by performance in Bulgaria, 2020

Company	No.of employees	Earnings after taxes (EAT) in EUR	Firm Performance (EAT per employee)
Enterprise Service	3163	8 200 000	2592
Alkomet	1111	7 000 000	6300
Yaazaki Bulgaria	7000	-400 000	-57
Teklas Bulgaria	2703	27 000 000	9989
Sensata technologies	3658	13 000 000	3554

Source: Authors own elaboration

The necessary measures are in the field of direct economic support, modern tax policy, as well as measures applied by the regulators in Bulgaria in terms of access to the territory and permission for use. The control system for the implementation of the current legal and technical requirements for the movement of cars on the national road network is extremely important. The recession, which is observed in the main economic markets, undoubtedly affects the opportunities for rapid recovery of Bulgaria in 2021.

Bulgaria is part of the European Economic Area and is undoubtedly an open economy. This implies that export-oriented industries and industries are recovering at a rate different from the recovery of the domestic consumption and investment sectors. Current forecasts show a trend of GDP growth of 2.5% in 2021 against the background of a decline of about 6% in 2020. We expect a positive trend in the

purchase of new cars in Bulgaria. When we consider the decline in 2020, it is clear that the levels of 2019 and even 2018 will not be reached in 2021.

Our forecast is for growth on the double-digit limit, and this trend will be clearer than the second quarter of next year. Specifically, for Bulgaria in comparison with other countries in Central and Eastern Europe is the more dramatic reflection of negative trends in financial and economic development. As in the crisis of 2008-2009, in Bulgaria the decline is more intense than in Poland, the Czech Republic, Hungary, and the recovery rate is lower. This is also related to the high share of refinancing or leasing the purchase of new cars.

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One of the important trends in car consumption, which we are seeing in the current crisis, is the relatively higher stability of consumption in the premium segment compared to the general market. This specific model of consumption for developed markets is confirmed in our country. Naturally, even in Bulgaria, despite the lack of sufficiently effective measures to stimulate the entry of electric mobility, there is an increased demand for electric cars (BEV) and a particularly strong trend in rechargeable hybrids (PHEV). For example, in the BMW Group the latter marked a 370% increase compared to the previous year.

Conclusion

Even during periods of active restrictive measures in the country, the automotive sector continued to operate continuously. In the automotive industry, employment has remained the same. The search for highly qualified specialists continues. Companies operating in the wholesale sector and retail operators have implemented aggressive measures to control and limit costs. Limited and delayed production has also led to a reduction in stocks to levels adequate for consumption. At the same time, the regulations on the emission levels of newly registered cars and introduction of CSR practices are not affected by the economic downturn and the decline in consumption. This puts car

manufacturers to the test in the context of cost-cutting to keep the pace of renewal of the product line up and even speed it up. Otherwise, the cost of fines would be significant. The biggest change that accompanies our entire life in a pandemic is related to the role of the digital economy and trade and changes in the model of our communication. These changes have a major impact on the global automotive industry and are reflected in both R&D and automotive CSR activities. Last but not least, there is a process of accelerating the creation of a single car register, Bulgaria's accession to the registers of leading European countries and the possibility of electronic registration of new cars in the country.

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