EXPLORING THE CONCEPT OF MARKET DEPTH IN THE SOUTH AFRICAN MARKET: AN EMPIRICAL ANALYSIS

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ABSTRACT

The market depth of an asset has always been an important concept in banking and financial markets because of its connection with hedging and trading cost. From a regulatory perspective, market depth is an important concept for order optimisation where it assist market participants to place their orders in the right direction. Accordingly, the effect of trading volume on market prices have been extensively used as a norm to explore market depth. The objective of this study was to test and validate the price continuity theory of liquidity in order to determine if there are additional variables that could give a more vivid explanation of market depth. Using a panel data spanning over a period of 5 years from May 2016 – May 2021 from the Johannesburg stock exchange and a fixed effect model, the findings revealed that buyer and seller initiated trades are also important variables in explaining market depth. In this regard, this study proposes the price continuity theory as a more comprehensive measure for accessing market depth.

Keywords: Market Depth, Fixed Effect, Kolmogorov-Smirnov Test Results, Trading Volume, Buyer Initiated Trades, Seller Initiated Trades.

INTRODUCTION

Market depth refers to the order size required to change the price of a security (Boonvorachote & Lakmas, 2016). For liquid security, large orders are not required to move the price significantly (Chueh et al., 2010). In most markets, order quantity changes are usually accompanied by a subsequent change in price, which is not the case for liquid assets (Engle & Lange, 2001). Prices do not move significantly with new market orders in a deep financial asset due to a perfect fit between the order volumes and market price (Chueh et al., 2010). This is because the trading of liquid assets matches the best offer prices and bid prices swiftly, which causes market orders to be filled quickly with no movement in prices (Mu et al., 2010).

Conversely, there is a significant difference between market order prices and trading volumes in illiquid security characterised by a lack of market depth. Prices in these illiquid assets tend to move based on aggressions by market participants, which is in line with the notion that when there are more buyers than sellers, prices tend to increase and vice versa. This is to say that the aptness of limit order books to suck up trading orders depends on the aggression of market participants. A market reaction curve tends to be steeper, indicating significant price changes and a lack of liquidity. Therefore, it is evident that market depth is directly linked to market price and trading activities, especially trading volumes. These trading activities and market prices are displayed in well-organised exchanges and trading systems where market participants enter their orders at different times and prices. The price entered by the market participant determines which orders get priority over the others and how the orders are matched, and the most aggressive prices receive priority (Mattos et al.,

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2007). If the aggressive prices are the same, non-hidden orders are prioritised, followed by the chronology of orders. Price priority, non-hidden orders, and chronology priority allow participants to trade aggressively, displaying their entire orders and encouraging early trades, increasing market depth. Therefore, market depth is based on trading activities were Frank & Garcia (2008) believes that there are several benefits of adequate market depth in an asset. Some of these are;

Market depth reduces hedging costs. Market participants are constantly faced with price fluctuations partly due to order imbalances. This risk is mitigated where there is depth, and the asset prices are relatively constant

Market depth also reduces trading costs.

1. Market depth provides the necessary information regarding the liquidity of an asset and its trading activities. Notably, deep financial assets have their buy and sell orders displayed, which is necessary for decision marking.
2. Market depth is relevant in order optimisation. Optimised orders enable market participants to place their order in the right direction where there are large orders.

Geographical Review of the Concept of Market Depth

Market depth in the context of market price and trading volume in financial markets has been extensively. It is worth noting that the studies below were reviewed based on the context of market depth, that is to say, market price and trading activities. The relationship between market depth or stock market liquidity and other variables were not reviewed as it is out of the scope of this study. Harris (1996) tested the effect of tick size trading on quoted prices for stocks listed in the Paris Bourse and Toronto exchange. This study aimed to investigate the relationship between price volatility and tick size, which is trading volume using a sample of 300 stocks. Using regression analysis, the findings of this study revealed a significant positive effect between trading volume and price volatility, inferring low levels of market depth.

The study of Kempf & Korn (1999) investigated the market depth level in the German futures index markets. Kempf & Korn (1999) used price logarithm and net order flow as indicators of market depth. The price logarithm was the dependent variable, while net order flow was the independent variable. The authors used 15 minutes trading volume data of trading volume as measures of net order flow. Using 18729 observations of the samples from 1993 to 1994 and a linearity test model, Kempf & Korn (1999) found a significant movement in prices from trading volumes. This indicated a lack of market depth in the German index market.

In a similar type of study, Engle & Lange (2001) measured the level of market depth using a net volume to price volatility (VNET) model and a 1-year data from the trade, orders, reports and quotes (TORQ) in the New York stock exchange. Engel & Lange (2001) believe that a lack of market depth is a function of order imbalance between the buyers and sellers initiated trade which causes price movement. This might result from new information in the market that is not reflected in the prices. Engle & Lange (2001) used a sample of 144 stocks over three months from 1st of November 1990 to 31st of January 1991. The authors used an auto regression conditional model to analyse the data and found that market depth changes with trading volume and transaction sizes. Their study revealed that there were periods when prices stayed constant regardless of the trading volumes. However, there were periods where prices moved with trading volumes.

In Asia, Brockman & Chung (2002) invested the impact of informed trading in the Hong Kong stock exchange from May 1996 to August 1997. This study aimed to investigate how traders and hence trading activities affected the liquidity position in the Hong Kong

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stock market. Brockman & Chung (2002) used 645 stocks to analyse this relationship and found that market depth was significantly affected by the trading level where price fluctuates randomly.

Still in the US, Choridia et al. (2001) also explored the effect of trading volumes on market depth, where the effect of trading volume on price fluctuations was determined. The purpose of their study was to analyse the time series fluctuations of liquidity in the NYSE. Choridia et al. (2001) used a panel regression for a sample of 2694 firms in the exchange from 1989 to 1998. The findings revealed a significant positive price imbalance due to trading activities. This led to the conclusion of lower levels of market depth in the NYSE for that period.

Elsewhere, Pennings et al. (2003) evaluated the market depth of Agricultural futures exchange in the Amsterdam market. The authors hypothesised market depth into four phases: sustainable, lag adjusted, restoring, and recovery. Pennings et al. (2003) used linear regressions and Dicky Fuller test to analyse a data set from August to September 1995. The authors found that prices fell significantly due to limit order imbalance, indicating a lack of market depth revealed in the lag adjusted and restoring phases. However, Pennings et al. (2003) study used a very small sampling frame (2 months) and was conducted in Europe; therefore, its findings may not be generalisable to the South African markets.

In the US, Rahman et al. (2005) simultaneously examined the level of market depth in the NYSE and NASDAQ using a sample of 30 stocks from January to March 2000. Their study aimed to determine the direction trading volume has on price changes. Using a vector autoregression model, Rahman et al. (2005) found high levels of market depth in the NYSE and lower levels in the NASDAQ because trading activities in the NYSE were non-informational and did not affect the market price.

In a later study, Frank & Garcia (2008) also investigated the market depth of the cattle market in the Chicago mercantile exchange. The authors estimated the impact coefficient between the trading volume at different time intervals and the logarithm of prices as proxies of market depth. Frank & Garcia (2008) believe that deep financial markets should absorb the different trading activities characterised by incoming market orders. This implies that the market reaction curve, which shows the effect of trading volumes on prices, should be reasonably constant. Using a Bayesian model and an average of 32 transaction sizes, the authors found the Chicago mercantile exchange to have high levels of market depth because price movements were not directly observable.

In an Asian study, Chueh et al. (2010) investigated the price duration market depth on the Taiwan stock exchange futures market. Their study aimed to investigate specific factors that affect market depth. Chueh et al. (2010) used data spanning two years from 2001 to 2002 for five different contracts and VNET methodology to analyse the price duration market depth. Unlike Frank & Garcia's (2008) study, Chueh et al. (2010) found that trading volume and size are essential factors determining market depth. The authors also found that the market reaction tends to be non-linear from the price duration depth. The authors concluded that investors tend to increase their trading behaviours when price volatility increases hence lower levels of market depth.

In another Asian study, Boonvorachote & Lakmas (2016) investigated the impact of trading volume and open interest volumes on price changes in the Asian market comprising Japanese, Chinese, Thai and Singaporean futures exchanges. Their study aimed to analyse market depth by exploring the information influence of trading volume on price volatility. The authors also used the logarithm of price changes as the dependent variable and trading volume and open interest as the independent variables. Boonvorachote & Lakmas (2016) used a sample of 4 rubber futures contracts and four gold futures contracts from 2006 to 2012 as the sample size. Using a generalised auto regression conditional Heteroscedasticity, their

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findings revealed a significant positive relationship between trading volume and price changes. However, the findings also revealed a significant negative relationship between open interest and price changes. The implications of this study revealed a low level of market depth in the Asian commodity futures markets.

Bhattachary & Bhattachary (2018) also explored the properties of market depth in the Indian stock market. The authors believe that illiquidity presents uncertainty and risk to investors and potential investors relating to their investment. Bhattachary & Bhattachary (2018) used spectral regression, Hurst Mandelbrot statistics and rescaled range statistics to investigate market depth from 2002 to 2016. The study made use of trading volume, turnover rate and individual asset prices. The authors found high levels of market depth in the Indian stock exchange. This was evident in the persistent ability of the index to absorb large market orders without significant price changes.

Similarly, Olbrys & Mursztyn (2019) empirically analysed the market depth of the Warsaw exchange as a dimension of market liquidity. The authors used a sample of 53 firms listed on the index from 2005 to 2015. The findings of the study indicate a high level of market depth. This was seen in the empirical regression results as the buyers and sellers initiated trades of the largest companies did not affect the asset prices.

In an Australian study, Pham et al. (2020) exploit the information content of market depth in the ASX200 index. The purpose of the study was to investigate the effect of trading volume on price volatility. The authors believe that the dynamics of price changes explain the information process of deep financial markets. Pham et al. (2020) used financial data of 60 stocks from 2007 to 2013 and a heterogeneous autoregression model to examine the level of market depth. 89 802 580 trades were examined, comprising 46 290 024 buyer initiated trades and 45 512 556 seller initiated trades. The study's findings revealed that market depth tends to be high when market orders are less than limit orders. This is because the prevailing market orders are absorbed without altering the prices. Conversely, when the market orders are greater than the prevailing quoted order, market depth tends to be very low in the Australian market.

The above studies investigated market depth by observing the relationship between trading volume and price movements. The proposition suggested by Black (1971a) may be more useful in estimating depth in financial markets. The aim of this study is to use the black's (1971b) theory of market depth in order to propose a more comprehensive framework. Therefore, the following hypothesis was used:

H_0: *According to the price continuity theory of liquidity preference, trading volume (TV), buyer and seller initiate trades (BIT & SIT) will significantly impact logarithmic of price scale and hence suitable for market depth*

H_1: *TV, BIT & SIT will not significantly impact logarithmic of price scale and hence not suitable for market depth*

LITERATURE

Theoretical Underpinnings

A theory is a tool, system, or proposition used to explain any construct of interest logically, systematically and coherently within some assumptions and boundaries (Kalinichenko et al., 2014). Theories are used to explain the relationship between constructs for an event or phenomenon (Glanz et al., 2008). A theory is bound by data analysis to either confirm, reject, or deconstruct the proposition that frames a study's conclusion (Kivunja, 2018). Therefore, theories can be seen as one of the foundations of research and help explain the context of the research and justify the research questions. This study's financial market

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depth constructs were based on Black's price continuity theory of liquidity preference developed by Black (1971a), which started with Keynes (1936) liquidity preference theory. The liquidity preference was postulated to expound on the determination of interest rate using supply and demand for money, where the demand for money was theorised as an asset (Keynes, 1936). According to Keynes (1936), interest is the compensation for forgoing liquidity, and cash is the most liquid asset. Accordingly, assets should be considered liquid if they can be quickly converted to cash to meet the demand for money (Keynes, 1936). This intuitive logic was based on three motives which are transactionary motive, precautionary motive and speculative motive. According to Keynes (1963), market participants will prefer liquid assets for trading purposes due to uncertainty that may arise in the expected income of risky assets. Also, holding liquid assets serves as a precautionary motive in order to meet unexpected contingencies. Black (1971a) theory identified four variables that constituted market depth: price changes, buyer-side trades, sell-side trades, and trading volumes. An understanding of market depth is a sine qua non in financial market liquidity, especially in trading financial assets (Black, 1971b). Market depth was defined by Black (1971a) as the ability to trade a large number of stocks in the short and long. periods without significant change in price. An understanding of market depth provides good knowledge of the prevailing orders and how these affect the price of a liquid asset. This is seen in the general trend of the market, where increased stocks are seen. An asset is considered to have sufficient depth if more than 80% of the stock is trading above its 200 days moving average Caginalp & Laurent. Therefore, market depth recognises the long term and short term price stability trends of a liquid asset.

Before applying the Black (1971b) theory, a meta correlation analysis technique was employed to observe the extent to which trading volume affects price volatility. That is to say, the magnitude and effect size of trading volume on price. This was to investigate how the effect size of trading volume as described by the authors in section 1 can adequately explain the movement in price fluctuation without considering other variables. In conducting this analysis, only studies with reported R square (R^2) values were used as some studies in the literature of market depth did not present their R^2 values. The research methodology section presents a summary of the relevant studies.

RESEARCH METHODOLOGY

Table 1
SUMMARY OF R^2 ANALYSIS

Authors	Dependent variables	Independent variables	Sample size	R-square value
Harris (1996)	price volatility	Tick size	300	64.40%
Kempf & Korn (1999)	Price changes	Trading volume	18729	5%
Brockman & Chung (2002)	Price changes	Trading volume	645	41.50%
Choridia et al. (2001)	Price changes	Trading volume	2694	33.00%
Pennings et al. (2003)	Price changes	Limit order imbalances	30000	9.90%
Chueh et al. (2010)	Price duration	Trading volume	5 contracts	64.30%
Boonvorachote & Lakmas (2016)	price volatility	Trading volume	4 contracts	1.70%
Pham et al. (2020)	price volatility	Trading volume	60	1.20%

Source: Author

A Kolmogorov-Smirnov Test was used to determine the R^2 normality distribution of the sample sizes under consideration Table 1. This test is used to evaluate the cumulative distribution of the actual data values to that of normal probabilities (Drezner et al., 2008). In this study, the cumulative distribution of the R^2 values was compared to the theoretical

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normal distribution. This was done by comparing the difference between the actual and expected outcome to a critical value. The critical value was computed using the one-sample test in excel, and two hypotheses were analysed in order to determine whether the values R^2 from the selected sample are normally distributed. The hypothesis below was derived from the study of (Arnastauskaite et al., 2021).

H_2: The maximum value of the difference between the actual and expected value is less than the critical value; hence R^2 is normally distributed

H_3: The maximum value of the difference between the actual and expected value is greater than the critical value; hence R^2 is not normally distributed

The Table 2 below presents the output of the Kolmogorov-Smirnov Test.

Table 2
KOLMOGOROV-SMIRNOV TEST RESULTS

R-square value	Cumulative	Expected	Rank	NORM.S.INV	Actual	Difference
64.40%	1	0.125	-0.125	-1.150	0.913	1.038
5.00%	2	0.250	0.000	-0.674	0.201	0.201
41.50%	3	0.375	0.125	-0.319	0.696	0.571
33.00%	4	0.500	0.250	0	0.579	0.329
9.90%	5	0.625	0.375	0.319	0.256	0.119
64.30%	6	0.750	0.500	0.674	0.913	0.413
1.70%	7	0.875	0.625	1.150	0.169	0.456
1.20%	8	1	0.750		0.164	0.586
	Count	8				
	Mean	27.63%				
	Standard deviation	27%				
	Maximum	1.038				
	Test statistics (5%, n=8)	0.454				

Although the sample size is small, the findings above indicates that R^2 is not normally distributed and trading volume accounts for minimal price variations. Therefore, the model proposed by Black (1971a) to investigate market depth may provide more insights into the market depth of equity securities.

A fixed effect was used to investigated the market depth of 51 securities listed on the Johannesburg stock exchange from 2016 – 2021. These securities where selected based on specific criteria for liquid securities as highlighted in the Basel Committee on Banking Supervision (BCBS, 2010). This model was deemed appropriate as the covariance of the fixed effect is not equal to zero. The specified model used was directly linked to the hypothesis stated in section 1 which was; TV, BIT & SIT will significantly impact logarithmic of price scale which is given below.

$$ln\frac{P_1}{P_0}{}_{it} = \beta_0 + \beta_1 TV_{it} + \beta_2 BIT_{it} + \beta_3 SIT_{it} + \varepsilon_{it} \quad \text{where } \varepsilon_{it} \text{ is the error term.}$$

$ln\frac{P_1}{P_0}$ is the logarithmic price scale.
TV is the trading volume
BIT is the buyer initiated trades
SIT is the seller initiated trades

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The final analysis for this alternative was the Wald causality test. Regression statistical inferences do not logically imply causation. Although there might be evidence of an existing relationship, simple regression cannot determine the direction of influence. Hence the need for a Wald causality test to determine causality. Causality is appealing through the lens of a theoretical framework. The theoretical considerations used for the test are described in the Black (1971a) theory. More specifically, the following causality relations will be investigated through the Wald causality test. TV, BIT and SIT causes changes in log of price scale, In this case, the p-value > 5%.

DATA RESULTS AND ANALYSIS

Table 3
SUMMARY OF FIXED EFFECT MODEL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000579	0.000126	-4.587859	0.0000
BIT	4.94E-08	5.34E-09	9.249836	0.0000
SIT	2.18E-08	3.11E-09	7.020229	0.0000
TV	-7.10E-08	6.18E-09	-11.48912	0.0000
Effect specification				
F-statistics	4.214687			
Prob(F-statistics)	0.00000			

Source: EViews output

The p-values for the independent variables are less than 5% as shown in Table 3 of the fixed effect. This means TV, BIT, SIT significantly affect the price distribution. The negative coefficient implies that TV moves in opposite direction to price distribution which is the norm in most financial markets. The results of Table 3 also indicate that aggressive trading quantity move prices significantly for active trading due to price changes, and the ability to enter or exit the market with large volumes might not be appealing. There H_0 is accepted and H_1 rejected

Apart from the significant effect, the coefficients also present some interesting findings. TV moves in the opposite direction to the log of price scale while BIT and SIT move in the same direction as the dependent variable. As TV increases, the price scale distribution decreases, making it more likely to reach the buy or sell price target (Chen, 2013). Also, the price distribution decreases when the number of BIT and SIT decreases and vice versa, meaning prices are more stable when sellers and buyers are less aggressive in trading. Also, from the F-statistics output, the model is a good fit since the p-value from the output is less than 5%. Although theoretically correct, the direction of influence must be confirmed with statistical evidence. To this end, the results of the Wald causality test are presented below Tables 4 to 6;

Table 4
WALD CAUSALITY TEST FOR TV

Test Statistic	**Value**	**df**	**Probability**
F-statistic	131.9998	(1, 63642)	0.0000
t-statistics	-11.48912	63642	0.0000
Chi-square	131.9998	1	0.0000
Null Hypothesis: TV=0 Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	

Source: EViews output

Table 5
WALD CAUSALITY TEST FOR SIT

Test Statistic	Value	df	Probability

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F-statistic	49.28361	(1, 63642)	0.0000
t-statistics	7.020229	63642	0.0000
Chi-square	49.28361	1	0.0000
Null Hypothesis: SIT=0 Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.

Source: EViews output

Table 6
WALD CAUSALITY TEST FOR BIT

Test Statistic	Value	df	Probability
F-statistic	85.55947	(1, 63642)	0.0000
t-statistics	9.249836	63642	0.0000
Chi-square	85.55947	1	0.0000
Null Hypothesis: BIT=0 Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
BIT		4.94E-08	5.34E-09

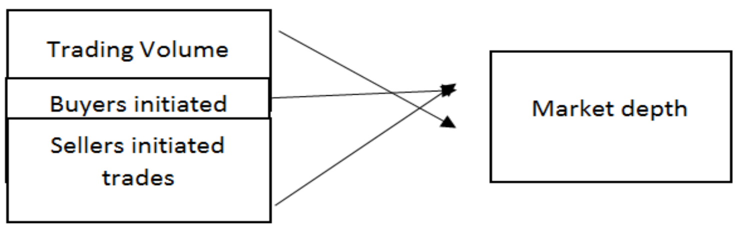
Source: EViews output

The above Tables 4 to 6 present the results of the causality test of the independent variables. The p-values in Tables 4, 5 and 6 are less than 5%. This means that the causality test for the null hypothesis for TV and BIT and SIT are all rejected. Therefore, the following conclusions can be made;

1. TV cause changes in $ln\frac{P_1}{P_0}$, therefore causality runs from TV to price scale
2. BIT cause changes in $ln\frac{P_1}{P_0}$, therefore causality runs from BIT to price scale
3. SIT cause changes in $ln\frac{P_1}{P_0}$, therefore causality run from the SIT to price scale

DISCUSSION

From the hypothesis in H_0 is accepted while rejecting H_1 due to the fact that TV, BIT, SIT significantly affect the price distribution. This was evident in the significant relationship (p-values less than 5%) between the independent variables (TV, BIT, SIT) to the dependent variable ($ln\frac{P_1}{P_0}$). The above results suggest that, market depth in the South African market can be best explained by using three variables namely, TV, BIT & SIT as opposed to just TV. This means that studies without BIT & SIT will be challenging to uncover numerous positions from both the buyer's and seller's perspectives. From a social science perspective, the inter construct relationship necessary for market depth was presented by the price continuity theory that has not yet been widely used. The current study contributes by explaining some of the constructs that have not been articulated well enough in prior literature, therefore a new framework for analysing market depth is highlighted below Figure 1.



Source: Black (1971a)

FIGURE 1
UPDATE MARKET DEPTH FRAMEWORK

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CONCLUSION

The purpose of this study was to investigate the Black's theory of market depth among selected securities on the JSE. This study stems from the perception that there might be more variables that can be used to explain market depth other than trading volume and price. The study contributes by explaining some of the constructs that have not been articulated well enough in prior literature: BIT and SIT. Hence, assisting in gaining a better understanding of the market depth of common equity securities. The results of market depth analysis in Table 3 indicates that SIT and BIT significantly affect price distribution and must be used for market depth. In this regard, the current findings reinforce the need for a more comprehensive measure for accessing market depth which is very important because existing literature is almost silent on the topic. The new framework may be applicable to other markets because BIT & SIT have significant implications to price movement. Future studies can also test this theory in other international financial markets to validate the framework.

REFERENCES

Arnastauskaite, J., Ruzgas, T., & Braženas, M. (2021). An Exhaustive Power Comparison of Normality Tests. *Mathematics*, *9*(788), 1-20.

Bhattachary, S.N., & Bhattachary, M. (2018). Persistence in liquidity measures: evidence from India. *Academy of Accounting and Financial Studies Journal*, *22*(2), 1-11.

Black, F. (1971a). Toward a Fully Automated Stock Exchange, Part I. *Financial Analysts Journal*, *27*(6), 29-34.

Black, F. (1971b). Toward a Fully Automated Stock Exchange, Part II. *Financial Analysts Journal*, *27*(6), 24-8.

Boonvorachote, T., & Lakmas, K. (2016). Price volatility, trading volume, and market depth in Asian commodity futures exchanges. *Kasetsart Journal of Social Science*, *37*, 53-58.

Brockman, P., & Chung, D.Y. (2002). The impact of informed trading on corporate Liquidity. *Journal of Multinational Financial Management*, *12*, 239-259.

Chen, J.M. (2013). Measuring market risk under the Basel accords: VaR, stressed VaR, and expected shortfall. *The IEB International Journal of Finance*, *8*, 184-201.

Choridia, T., Roll, R., & Subrahmanyam, A. (2001). Market Liquidity and Trading Activity. *The Journal of Finance*, *6*(2), 501-530.

Chueh, H., Yang, D.Y., Yang, J.A., & Fang, Y. (2010). Market Depth of Price Duration in the Taiwan Stock Index Futures Market. *International Research Journal of Finance and Economics*, *48*, 154-167.

Drezner, Z., Turel, O., & Zerom, D. (2010). A Modified Kolmogorov–Smirnov Test for Normality, Communications in Statistics. *Simulation and Computation*, *39*(4), 693-704.

Engle, R., & Lange, J. (2001). Predicting VNET: A model of the dynamics of market depth. *Journal of Financial Markets*, *4*, 113-142.

Frank, J., & Garcia, P. (2008). Market Depth in Lean Hog and Live Cattle Futures Markets. In proceedings of the NCCC-134 Conference on *Applied commodity price analysis, forecasting and market risk management*, St. Louis, MO.

Glanz, K., Rimer, B.K., & Viswanath, K. (2008). Health behavior and health education: theory, research, and practice. San Francisco: Jossey-Bass Inc.

Harris, L. (1996). Does a large minimum price variation encourage order exposure? (Working paper). University of Southern California. USA.

Kalinichenko, L.A., Kovalev, D.Y., Kovaleva, D.A., & Malkov, O.Y. (2014). Introduction into Analysis of Methods and Tools for Hypothesis-Driven Scientific Experiment Support. In Proceedings of the 16th All-Russian Conference on Advanced Methods and Technologies 2014 (13-16): Dubna, Russia.

Kempf, A., & Korn, O. (1999). Market Depth and Order Size. *Journal of Financial Markets*, *2*, 29-48.

Keynes, J.M. (1936). The general theory of employment, interest and money. New York: Harcourt, Brace, USA.

Kivunja, C. (2018). Distinguishing between Theory, Theoretical Framework, and Conceptual Framework: A Systematic Review of Lessons from the Field. *International Journal of Higher Education*, *7*(6), 44-53.

Mattos, F., Garcia, P., & Pennings, J.M.E. (2007). Trading Behavior in Futures Markets: Its Determinants and Implications. In proceedings NCCC-134 Conference: Applied Commodity Price Analysis, Forecasting, and Market Risk Management (Pp16-17). Chicago, Illinois, USA.

Mu, G.H., Zhou, W.X., Chen, W., & Kertesz, J. (2010). Order flow dynamics around extreme price changes on an emerging stock market. *New Journal of Physics*, *12*, 3-22.

Citation Information: Enow, S.T., Kasse, S., & Dubihlela, J. (2022). Exploring the concept of market depth in the south african market: an empirical analysis. *Academy of Accounting and Financial Studies Journal, 26*(5), 1-10.

Olbrys, J., & Mursztyn, M. (2019). Depth, tightness and resiliency as market liquidity dimensions: Evidence from the polish stock market. *International Journal of computational Economics and Econometrics*, *9*(4), 308-326.

Pennings, J.M.E., Garcia, P., & Marsh, J.W. (2003). The Underlying Structure of Market Depth. In proceedings of NCR-134 Conference: Applied Commodity Price Analysis, Forecasting, and Market Risk Management, April 21-22, St. Louis, Missouri, USA.

Pham, M.C., Anderson, H.M., Duong, H.N., & Lajbcygier, P. (2020). The effects of trade size and market depth on immediate price impact in a limit order book market. *Journal of Economics Dynamics & Control*, *120*, 2-27.

Rahman, S., Krishnamurti, C., & Lee, A.C. (2005). The dynamics of security trades, quote revisions, and market depths for actively traded stocks. *Review of Quantitative Finance and Accounting*, *25*, 91-122.

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