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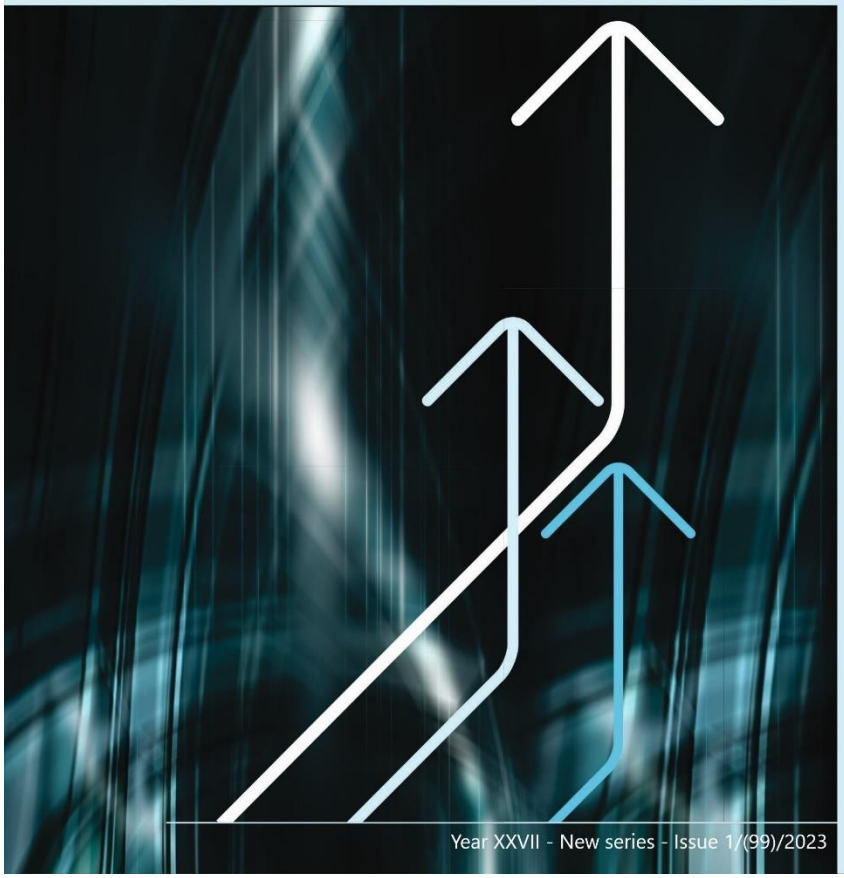

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“VICTOR SLĂVESCU” CENTRE FOR FINANCIAL
AND MONETARY RESEARCH

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RELATIONSHIP BETWEEN DIVIDEND YIELD AND FINANCIAL PERFORMANCE OF LISTED FIRMS AT THE NAIROBI SECURITIES EXCHANGE

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Abstract

This study assessed the relationship between dividend yield and financial performance of the listed companies at Nairobi Securities Exchange. Bird in hand theory anchored the study. An explanatory research design was adopted where all the 62 firms listed in Nairobi Securities Exchange (NSE) participated in the study. Secondary data collected from the published financial statements for the years from 2018 to 2020 by use of a data collection sheet was analysed using descriptive statistics and regression analysis. The results indicated that dividend yield had a positive and significant relationship with the performance of the listed firms at NSE. The study recommended that the listed firms should strive to have a sizable amount of the profits accrued by the firm be paid as dividends and that the listed firms should strive to be consistent in their dividend payments.

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Keywords: earnings, bird in hand theory, dividend policy, investment decision

JEL Classification: G32; G35; G40

1. Introduction

Dividend used by itself is generally understood to mean the distribution of earnings by a company to its shareholders (Hayes, 2022). The history of corporate dividends is dated back to the seventeenth and eighteenth centuries when joint stock trading companies in Holland and Great Britain made the first dividend payment (Frankfurter & Wood, 1997). On the other hand, dividend policy emerged in the nineteenth century since dividends came to be seen as an important source of information (Modigliani & Miller, 1961). This was a result of unreliability and scarcity of available financial data in the market which made investors make investment decisions by assessing the dividend patterns of firms. Dividend yield on the other hand is the financial ratio that measures the amount of cash dividends paid out to shareholders relative to the market value per share (Hayes, 2022). Since the emergence of dividend policy in the 19th century, dividend decisions have remained a thorn in the flesh of many companies globally, regionally, and locally.

The global commodity downturn of 2015-16 forced the Broken Hill Proprietary Limited to slash dividends in 2016 for the first time in 15 years which eventually led to a sharp decline in its share price indicating that dividend pay-out has a greater impact on the share price of the companies which eventually affects their performance (BHP 2016). In Africa, the Maritime Telecommunications network group realized a return of $280m in 2020 in form of dividend from the Nigeria subsidiary which happened in two years where dividends had not been declared. After the news of dividend announcement, the share price closed at 6% higher on that very day (Ajifowoke, 2021). This shows that dividends might potentially have a big and favourable impact on a company's share price. In Kenya, it is opined that dividend pay-out does not affect the performance of insurance companies listed in the Nairobi securities exchange (Murimi & Mungai, 2021).

The nature of the association between dividend pay-out and the financial performance of the firm has faced unresolved debate by researchers for a long period of time (Dada et al., 2015). This has remained a controversial problem in the corporate world despite

various studies being done in the area of interest. Black (1976) noted, "the harder we look at the dividend picture, the more it seems like a puzzle with pieces that just don't fit together". In Kenya, the firms listed at the NSE play a critical role in economic growth (Musyoka et al., 2018). Kanyatta and Kagiri (2017) revealed that the stock market development contributes 46.1 percent of the economic growth in Kenya. The NSE 2021 study states that the exchange supports economic growth in Kenya by promoting savings and investment as well as facilitating access to affordable capital for both domestic and foreign businesses. Despite all the benefits, firms at NSE have consistently reported low financial performance which is posing a threat not only to the future of the exchange but also to the future of the companies. Kiuva (2020) revealed that NSE extended suspension on trading of two firms, that is Mumias Sugar Company and Fashion retailer Deacons East Africa shares. This was as a result of the receivership placed on those firms on September 20, 2019 and November 19, 2018 respectively. Amongst the many reasons for poor performance of those firms is lack of a well-structured dividend payout policy which has consistently made the companies' shares to trade below their real values thus lack of prospective investors. Many studies on dividend have dominated developed countries such as Britain and Istanbul such as the works of Musiega et al, (2013) and Adaoglu (2000) respectively. Few studies done in Kenya at NSE have focused on sectors rather than the entire exchange as it is with the works of Kariuki (2016) and Nekesa et al. (2021) who based their studies on the manufacturing and banking respectively.

2. Literature review

The bird in hand theory proposed that there is a relationship between the value of the firm and dividend yield. It stipulated that dividends are less risky than capital gains since they are more certain. Investors prefer to receive dividends 'today' than in future because current dividends are more certain than future capital gains that might be realized from investing retained earnings in growth opportunities (Gordon, 1962), and (Weston, 1963). Because of the uncertainty, investors prefer current dividends (even if they are lower) to future capital gains therefore, a bird in the hand (dividend) is worth more than two in the bush (capital gains).

Since the theory proposed that there exists a relationship between dividend yield and financial performance of the firm, it was of much relevance to this study which sought to prove if there is relationship between dividend yield and financial performance.

Empirical review regarding the study variable was conducted. Murimi and Mungai (2021) used dividend yield as one of the independent factors impacting the financial performance to examine the impacts of dividend policy on the financial performance of insurance businesses listed in Nairobi Securities Exchange, Kenya. From their findings it was revealed that dividend yield has a positive effect on the performance of insurance companies listed at the Nairobi Securities Exchange. The study therefore used the same variable for the entire firms listed at NSE to come up with a conclusion which applies to all firms at NSE, Kenya.

Osakwe et al. (2019) examined the effect of dividend policy on stock prices with empirical evidence from Nigeria. Their study applied dividend yield dividend yield as one of the independent variables measuring dividend policy. The results showed that dividend yield had an insignificant negative effect on market price per share. The study used the same independent variable dividend yield to investigate the relationships between dividend pay-out and financial performance of all firms listed at the Nairobi Securities Exchange.

Kanakriyah (2020) conducted a study to examine the nature of the correlation between dividend policy and a corporation's financial performance in developing countries. The results detected a strong relation between dividend yield and firm performance. Since the study was conducted out of the scope of Africa, it might not be applicable in Kenya and that's the reason why the researcher conducted the same study in the Kenyan context.

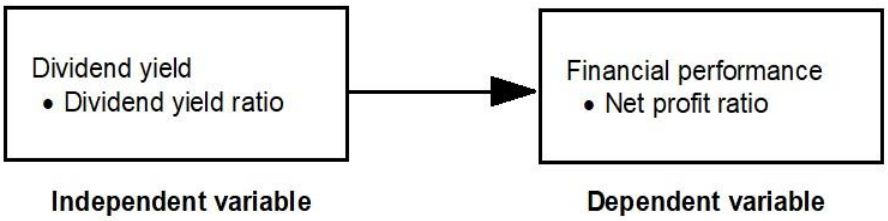
Memon et al. (2017) in their study examined the effect of dividend policy on market prices of firms' stocks of the nonfinancial sectors of Pakistan during the period from 2006 to 2015 which their findings revealed that there is a negative significant impact of dividend yield on stocks market prices. This study therefore intends to use firms from all sectors, in order for all firms at NSE, Kenya to benefit from its findings.

Kim (2020) assessed the link between Korean stock returns, dividend yield, and dividend reputation. Findings showed that dividend yield depends on a firm's dividend reputation. The data revealed that corporations with higher yields that have a reputation for paying

dividends generate greater future returns, but firms with no reputation had no discernible association between yields and returns. The study was excellent overall, although it was conducted in an advanced Asian nation. Thus, by focusing on an African emerging nation, the study addressed a vacuum in the geographic literature.

Figure 1

Conceptual framework



Dividend yield is the financial ratio that measures the amount of cash dividends paid out to shareholders relative to the market value per share. The study operationalized this variable by finding the dividend yield ratio which measures the return on investment in share and it's calculated by dividing dividend per share with the stock price.

Profitability is a measure of the organizations profits relative to its expenses. The study used net-profit ratio which is a ratio that measures the relationship between net profits and net sales, it done by dividing net profit with net sale.

3. Research Methodology

An explanatory research design was adopted by the study which was conducted in Kenya with the main focus was only firms listed at NSE. All the 62 firms listed in the Nairobi Securities Exchange for the period between 2018 to 2020 were considered in the study. Secondary data from the firm's published financial statements were collected by use of a data collection sheet. Collected data was analysed using descriptive statistics. Simple linear regression was carried out in testing the relationship between dividend yields and financial performance as illustrated in the equation (1), below.

$$Y = \alpha + \beta_1 D_Y + \varepsilon \quad (1)$$

Where Y is financial performance, D_Y is the dividend yield, α is the constant term, β_1 is the coefficient used to measure the sensitivity of the dependent variable a unit change in the predictor variable and ε is the error term used to capture unexplained variations in the model and which is assumed to be normally distributed with a mean of zero and a constant variance.

4. Results and discussions

All the 62 companies listed on the NSE have participated in the study. All the financial records were accessed from these firms during the study period. This represents a 100% response rate.

The financial performance of the listed firms in NSE were assessed using the net profit ratio, and the results are as shown in Table 1.

Table 1

Financial Performance of the Listed Firms

Year	Mean	Standard deviation	Min	Max
2018	0.257381	0.531611	-0.4782	2.4266
2019	0.145513	0.597094	-2.7595	2.218
2020	0.107766	0.5329	-1.6835	2.165
Aggregate mean performance	0.17022	0.55537	-2.7595	2.4266

Source: author's calculation

The descriptive results above show that in 2018 the aggregate financial performance of the listed firms was 0.257381, declining to 0.145513 in 2019 and further declining to 0.107766 in 2020 an indication that profitability of listed firms has been declining from 2018 to 2020. The standard deviation was 0.531611in 2018, 0.597094 in 2019 and 0.5329 in 2020 an indication that the average financial performance across the listed firms was clustered around the mean response. The results of net profitability ratio show that the net profitability ratio had a mean of 0.17022 and a standard deviation of 0.55537. The standard deviation of 0.55537 implies that the net profitability ratio varied over time during the study period. Profitability is a measure of the organizations profits relative to its expenses. Financial performance measures the outcome of the organization's strategies, policies, and operations in terms of money.

The descriptive statistics for dividend yield includes the mean, standard deviation, minimum and maximum values. These results are presented in Table 2.

Table 2

Dividend Yield among the Listed Firms

Year	Mean	Standard deviation	Min	Max
2018	0.307596	0.324342	0.000	1.38
2019	0.287107	0.335429	0.000	1.491
2020	0.234056	0.321101	0.000	1.572
Aggregate Dividend Yield Ratio	0.276253	0.326724	0.000	1.573

Source: author's calculation

According to data presented in Table 2, in 2018, the aggregate dividend yield ratio for the listed firms was 0.307596, declining to 0.287107 in 2019 and further dropping to 0.234056 in 2020. The standard deviation was0.324342 in 2018, 0.335429 in 2019 and 0.321101 in 2020 an indication that the average dividend yield ratio across the listed firms was clustered around the mean response. The overall mean of dividend yield ratio is 0.27625 and the standard deviation is 0.32672. The standard deviation of 0.32672 indicate that the dividend yield ratio changed over time during the study period.

Regression results

OLS regression was conducted to determine the relationship between dividend yield and the performance of listed firms measured by profitability.

Table 3

Model Summary of Dividend Yield

Model Summary	2018	2019	2020
R	0.375	0.421	0.628
R Square	0.141	0.177	0.394
Adjusted R Square	0.127	0.163	0.384
Std. Error of the Estimate	0.496846	0.546211	0.418236

Source: author's calculation

Model summary in Table 3 showed that in 2018, dividend yield explained 14.1% of the financial performance oft listed firms at NSE, 17.7% in 2019 and 39.4% in 2020.This is an indication that dividend yield overtime from 2018 to 2020 has been adopted by listed firms to enhance performance of listed firms at NSE. The R-square for regression models using secondary data are generally low. The low R-squared is an indication of high-variability data which still can depict significant trend.

Table 4 shows the ANOVA results for 2018-2020, indicating whether the overall model is statistically significant.

Table 4

ANOVA Results of Dividend Yield and Financial Performance Listed Firms

	Model	Sum of Squares	Df	Mean Square	F	Sig.
2018	Regression	2.428	1	2.428	9.835	.003
	Residual	14.811	60	.247		
	Total	17.239	61			
2019	Regression	3.847	1	3.847	12.894	.001
	Residual	17.901	60	.298		
	Total	21.748	61			
2020	Regression	6.828	1	6.828	39.033	.000
	Residual	10.495	60	.175		
	Total	17.323	61			

Source: author's calculation

As displayed in Table 4, the ANOVA model results in 2018 was statistically significant, an indication that dividend yield is a satisfactory indicator of performance of listed firms (F statistic of 9.835; p value =.003<0.05). Similarly, the dividend yield in 2019 (F statistic of 12.894; p value =.001<0.05) and 2020 (F statistic of 39.033; p value =.000<0.05) were statistically significant across time period in financial performance of firms listed at NSE. The ANOVA results supports the hypothesis that dividend yield has a positive and significant effect on the performance of the listed firms at NSE.

Table 5 shows the model coefficient results.

Table 5

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2018	(Constant)	.068	.087		.781	.438
	Dividend Yield Ratio	.615	.196	.375	3.136	.003
2019	(Constant)	-.069	.092		-.758	.452
	Dividend Yield Ratio	.749	.208	.421	3.591	.001
2020	(Constant)	-.136	.066		-2.065	.043
	Dividend Yield Ratio	1.042	.167	.628	6.248	.000

Source: author's calculation

It was established that dividend yield in 2018 was statistically significant with performance of listed firms at NSE (β=.615, p-value=.003<0.05). Likewise, dividend yield in 2019 (β=.749, p-value=.001<0.05) and 2020 (β=1.042, p-value=.000<0.05) had statistically significant relationship with performance of listed firms at Nairobi Securities Exchange. The beta coefficients have been increasing overtime from .615 in 2018 to .749 in 2019 and 1.042 in 2020 which indicate that dividend yield has been increasing becoming important in stimulating performance of the listed firms in NSE over time. The results were in agreement with research conducted by Murimi and Mungai (2021) on the dividend policy effects on financial performance of insurance companies listed in the Nairobi securities exchange and found out that dividend yield has a positive effect on the performance of insurance companies listed at the Nairobi Securities Exchange.

The regression results indicated that dividend yield is positive and significantly related with the performance of the listed firms in NSE (β=0.3728, P=0.006<0.05). This means that a unit increase in the dividend yield leads to .3728 units increase in the performance of the listed firms in NSE. The null hypothesis that there is a no significant relationship between dividend yield and financial performance amongst listed firms at NSE was therefore rejected. Increased dividend distributions improve the financial performance of NSE listed companies.

5. Conclusion and recommendations

The study concluded that dividend yield has a positive and statistically significant relationship with the financial performance of the firms listed at NSE.

The study recommends that the listed firms should strive to have a sizable amount of the profits accrued by the firm be paid as dividends. This will boost the confidence of the shareholders and will be able to make more investments in the firm. As a result, the financial performance of the listed firms will be boosted, hence generating more and more investments.

The study found out after the analysis of the study data that even though the variable selected in the study was able to explain the variations in the financial performance of the listed firms, the study recommends that further research be conducted on the effect of nature of ownership and the financial performance of the listed firms at NSE.

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INVESTIGATING THE OPTIMAL EXIT TIMING AND LEVERAGE DURING THE COVID-19 CRISIS

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Abstract

This paper investigates the effectiveness of the corporate credit policies as a means of preventing market exit in the aftermath of the COVID-19 pandemic. A real options framework incorporating dynamic programming is employed to investigate the relationship between exit decisions, leverage ratio and productivity uncertainty. Our paper presents a novel approach to the exit problem in comparison to other attempts in early 2020. Taking into account the dynamics of firms, we allow for a variety of factors, such as productivity uncertainty, debt readjustment, liquidity constraints, and leverage level, to explain the optimal time for a firm to exit during the COVID-19 pandemic. Our results indicate that the corporate credit programs have a significant positive impact and suggests that a greater leverage ratio increases the likelihood of survival and delays the decision to exit.

Keywords: uncertainty, liquidity productivity, debt, real options

JEL Classification: G01; G33

1. Introduction

The coronavirus outbreak has posed the most severe challenge to economies worldwide, resulting in a historical recession with one of the most dramatic falls in modern times. The financial health of companies has been significantly impacted due to the corona-crash, with dire liquidity shortages and funding supply being of particular concern as the severity of the COVID-19 pandemic directly impacted consumer behavior and market demand. The International Monetary

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Fund (IMF, 2020) has identified that numerous countries have implemented various forms of financial assistance for small and medium enterprises (SMEs) to combat the effects of the COVID-19 pandemic, generally in the form of loans and loan guarantees. Equity markets have been profoundly affected, and so "debt and more debt" has become a central component of many organizations' support schemes to address the consequences of the coronavirus on companies, particularly SMEs. Nevertheless, questions remain as to how businesses should be salvaged and what type of financing would be most appropriate. Becker et al. (2020) suggested that the use of credit support is a viable means of responding to the COVID-19 pandemic, due to the importance of preserving economic sovereignty and fiscal resources, as well as the difficulty of distinguishing the damaged from the undamaged firms in the crisis due to the heterogeneity of the effects of the pandemic across industries. Subsequently, Sinagl (2020) found that differences in the effects of the pandemic on firms' revenue may be attributed to differences in consumer savings propensity and willingness to spend.

In order to regain their financial health, companies needed to secure additional liquidity to protect their value and avoid any financial difficulties. Working through liquidity issues can have an effect on the company's capital structure and financial leverage, which could potentially transform a liquidity crisis into a solvency concern. Despite the fact that numerous economists and international organizations (OCDE 2020, Moody's 2020) claim that corporate balance sheets were already highly leveraged prior to the COVID-19 crisis, credit remains the only way to ensure their survival given the absence of internal and external funding. Boot et al. (2020) found that governmental assistance programs that rely on debt financing can increase leverage, and therefore the "default risk," but are still preferable to "no-support". Bartik et al. (2020) further highlighted that firms with limited cash flows may have to choose between taking on additional debt or declaring bankruptcy. Megginson and Fotak (2020) described the COVID emergency as a "liquidity crisis" and they believed that the most appropriate response is to provide government financial support in the form of short-term bridge financing to sustain businesses and preserve employment. This should only be required for a few months rather than years. However, the authors conclude that rescuing distressed companies by injecting equity is more suitable than granting emergency debt. As many firms were suffering from a liquidity crisis, it

was difficult to bear the additional fixed cost (interest and principal payments on debt) and additional distress risk that higher leverage would bring.

We propose a dynamic tool whose contribution, presented by this paper, is a starting point for a pragmatic methodology based on real options that can guide other researchers in studying the effectiveness of governmental credit support policy under demand uncertainty. We propose to extend Olley and Pakes' (1996) model by including a debt parameter to explore the impact of demand shock, market efficiency, and capital adjustment on the exit decision. The primary concept of Olley and Pakes (1996) is that productivity is a function of capital stock and investment. This is used to define a firm's behavior in terms of whether to exit the market or to invest through financing actions, based on a productivity threshold level. While the application of a structural approach for decision-making in real-world problems is often limited due to the need for detailed data and uncertain future scenarios, the real option approach has traditionally provided an effective model framework to analyze regular investment and exit decisions (Dixit, 1989; Dixit & Pindyck, 1994). We assume a list of assumptions in order to create an analytical solution for exit decision. By finding the optimal stopping time, expressed as a function of leverage ratio, this model captures the interaction between exit threshold and leverage level under persistent profitability uncertainty. Murto and Terviö (2014) have argued that persistent profitability implies that a firm should exit if the current revenue falls under a threshold boundary. In our standard real options model, we factor in debt adjustment costs according to Q-theory.

The paper is structured as follows: Section 2 provides a review of relevant literature. Section 3 introduces a conceptual framework for exit decisions, extending Olley-Pakes' approach to focus on financing instead of investment decisions. Section 4 outlines a simple analytical solution exit problem based on real options. In Section 5, simulation is used to analyze the numerical results of our model. Finally, Section 6 concludes the paper.

2. Literature review

Many scholars have proposed theories and built models to explain the exit decision under aggregate fluctuations, with notable examples including Clementi and Palazzo (2013) and Gomes (2001),

as well as Lin and Wu (2003), Pieralli et al (2013), Murto and Terviö (2014), and Katchova and Ahearn (2017). In the context of the COVID -19 crisis, Crouzet and Tourre (2021) examine the effects of credit interventions on investment decisions in a partial equilibrium framework, while Miyakawa et al. (2021) study the effects using firm-level data for Japan and show heterogeneity in terms of exit rates across industries and regions. Additionally, Kalemli-Ozcan et al. (2020) use a cost-minimization model to measure the impact of the COVID-19 shock on business failures.

Despite the implementation of policy responses, the crisis has led to a serious threat of business continuity, resulting in an increase of firms leaving the market. Academic literature presents varying approaches in explaining firm bankruptcy or market exit, with economists suggesting either a lack of access to additional funds (Kalemli-Ozcan et al., 2020, Crouzet and Tourre; 2021) or an increase in leverage and the risk of "debt overhang" (Boot et al :2020). This paper will analyze these issues by examining the optimal decision to cease the business of a firm operating under persistent productivity uncertainty.

The issue of optimal capital structure and trade-off theory has been widely discussed in corporate finance, particularly in light of recent initiatives to implement credit support packages in order to sustain companies and avoid financial failure during the crisis. Titman and Tsyplakov (2007) analyze the ability of firms to adjust their capital structure choices during financial distress and find that they tend to increase their market debt ratios in the face of negative output shocks. Tserlukevich (2006) uses a real option model to explore financing behavior and suggests that, given transaction costs, debt is often the primary source of external financing for new investments. Hennessy and Whited (2005) also observe a negative relationship between profitability and debt and explain it as a “no anomaly” within the Q-theory. Bond et al (2010) use a model of debt policy in the presence of quadratic adjustment costs to demonstrate that the difference between the discount rate and the interest rate is a key factor in the decision to borrow. Finally, Eberly and Abel (2004) note that even if the effect size of adjustment cost on cash-flow is small, it can provide useful information about the capital stock growth prospects.

3. Conceptual framework of firm decision

Prior to delving into dynamic modelling based on the real options approach, we propose a conceptual framework that delineates the exit rules and their relationship to both capital accumulation and fluctuation in productivity. Building off the structural approach put forth by Olley and Pakes (1996), we present the logic of intertemporal investment and exit decisions. Unlike the study by Olley and Pakes (1996), our model takes into account a crisis context due to the COVID-19 outbreak, in which investors have to stop investing and only have access to debt as a source of capital. Our model also accounts for the impact of aggregate economic shocks on productivity. Furthermore, these shocks affect financing behavior and leverage adjustment. To provide a basic understanding of the exit decision, we start by assuming that capital accumulation does not incur any adjustment costs. We investigate a binary choice between staying in the market or not, in the context of a starting situation in which a firm is facing an unexpected liquidity shortfall due to the sudden outbreak of the COVID-19 pandemic and its resultant impacts on business activities. Kalemli-Ozcan et al. (2020) have demonstrated that liquidity shortfall is the primary cause of bankruptcies among small and medium enterprises. Liquidity shortfall occurs when the combination of firm revenue and internally available cash is unable to cover operational expenses, periodic financial obligations, or investment expenditures. Temporary liquidity shortfalls are typically caused by unexpected circumstances, such as production system failure or weakening aggregate demand, which lead to lower revenues within a given period. This scenario is reflective of the situation of a distressed firm during the COVID-19 pandemic, with a severely reduced demand and a heightened exposure to idiosyncratic risk across a variety of sectors.

In order to mitigate the effects of the crashing stock market, limited access to equity financing, and a sweeping lock-down, governments have been providing their respective economies with liquidity via loans and guarantees. It is assumed that these funds will be used by firms to replenish their capital stock (K), thus enabling them to remain operational. However, Bénassy-Quéré and Weder di Mauro (2020) suggest that the resulting debt overhang can lead to substantial economic costs but may be manageable in the post-pandemic era when firms can finance their operations without external support.

Usually, capital stock accumulation, K_{t+1}, is described by the following fundamental function:

$$K_{t+1} = (1-\rho)K_t + I_t, \;\; i \geq 0 \qquad (1)$$

with I_t and $\rho \in [0,1]$ define respectively the needed investment and the depreciation rate of the capital. The no-investment situation combined to issuing new debt to be able the stay in business will also increase the capital stock from K_t to K_{t+1} during [t, t+1].

Furthermore, we assume that anyway the needed liquidity to stay in business will entirely be funded by debt:

$$I_t = D_t, \quad D_t \geq 0$$

As in Carvalho et al (2017), when capital stock is growing by debt, it can be described as:

$$K_{t+1} = (1-\delta)K_t + D_t$$

The firm decision dynamics proposed by Olley and Pakes (1996) as well as Jovanovic (1982), Clementi and Palazzo (2016) and Gomes (2001) suggest that firms maximize their expected discounted value of future revenue, under uncertain market conditions, by choosing whether to exit or remain in the market through investment in physical capital. Within this framework, it is assumed that under aggregate fluctuation, the decision maker has the ability to make endogenous decisions to invest or exit the market.

- Increase the leverage level through refilling capital stock by issuing new debt to stay in business.
- Quit the business irreversibly, repurchases all existing debt at its face value before selling the company and receive a sell-off value *£.* This decision can be explained by the fact that once production stopped, it will be very costly to restart under the pandemic uncertainty.

Hence, the decision at the beginning of each period can be formulated as maximization problem where decision maker takes financing action to maximize the firm´s net revenue:

$$\max_{K}(\pi_t, £)$$

The max operation means that the decision maker will compare the value of net revenue generated by staying in business and the sell-off value.

The decision depends on the fluctuation of net revenue. The net revenue per period is defined as, $\pi_t(s_t, q_t)$, a function of the

perception of the future market structure defined by the state vector *s*, given the current information and the control decision vector *q*.

As in Olley and Pakes (1996), we assume that the decision to continue or not the business activity depends on a vector of states variable $s = (K, w) \in S$ the state space, where:

- w_t: a stochastic shock observed by the manager at each time *t*, and may be defined as the index of firm efficiency, profitability or productivity parameter and depends primarily on market condition.
- K_t: the firm´s capital stock at time *t*.

The productivity parameter *w* can be observed through an index assumed to be known for the firm and evolves stochastically over time according to a Markov process, where the conditional The productivity parameter w can be observed through an index assumed to be known for the firm and evolves stochastically over time according to a Markov process, where the conditional distribution of next period's profitability index w_{t+1} will be denoted as H (w_{t+1} | w_t). That means that decision maker must maximize the expected value of net revenue giving the perception of market interaction at time t. Since the decision can be taken when the decision maker is supposed to know the productivity level at beginning and the selling-off value is predetermined, the exit rule will be completely and simply defined by simple exit threshold.

For each capital stock level, there is an exit threshold productivity. If productivity evolves to reach a level below w the firm exit, otherwise, the firm will stay in operation. The decision problem has two control variables. The decision vector, denoted a, is given by:

- A binary control variable χ, where:

$$\chi_t = \begin{cases} 1 \;\; if \; the \; firm \; decide \; to \; continue \; at \; time \; t \; where \; w > w^* \\ 0 \;\; if \; the \; firm \; decide \; to \; abondon \; at \; time \; t \; where \; w \leq w^* \end{cases}$$

- A continuous control variable D_t, since the decision maker have control over firm´s financing policy.

$\chi_t = 1$ denotes that firm continue with staying in market and and $\chi_t = 0$ denotes a business's exit.

The productivity threshold is defined as:

$$w_t^* = w_t^*(K_t, D_t)$$

The decision maker chooses its debt level based on its beliefs about future productivity. The decision to borrow depends on its capital stock and productivity:

$$D_t = D_t(w_t, K_t)$$

The debt financing term implies that debt level increases in positive productivity shock. The firm which undergoes positive productivity shock in the period t will need to borrow more to cover increasing operation expenses. According to Olly and Pakes (1996), two decision rules $D_t(.)$ and $w_t(.)$, respectively defining the debt financing and exit decisions, are determined by a Markov-perfect Nash equilibrium. These decisions are contingent upon the parameters which specify the equilibrium and are contingent on the market efficiency of the decisions taken on time.

4. Framework of the dynamic programming

The decision to remain in business or to cease operations is dependent upon the assessment of future market conditions based on the available information. Dynamic programming offers the benefit of permitting the identification of optimal financing approaches in the presence of uncertain events, such as the occurrence of forced outages and major issues (Rothwell and Rust, 1995).

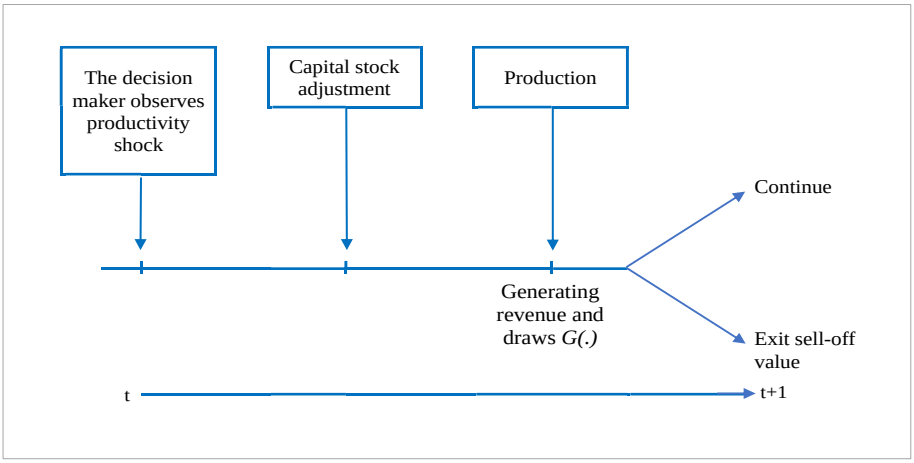
The DP model consists of:

- a discrete time index, $t \in \{0,1,2,\dots,T\}$
- a vector of state variables, s
- a control decision vector $a = (\chi, D)$
- a revenue function $\pi_t(s_t, q_t)$
- a discount factor, β
- a transition density (probability) $H(s_{t+1}|s_t)$

Since the purpose of our model is to define the exit decision as a function of debt financing strategy, we develop a tax neutral model and focus on instantaneous earnings before taxes and depreciation. In this case, π (·) is per-period revenue and G (·) is the payment occurring with the decision of staying in business, assuming that the decision to exit the market is a costless decision.

Figure 1

Timing of one-period events



Source. authors' contribution

According to our conceptual framework presented in section 2, we assume that at the beginning of period t-1, the decision maker observes productivity shocks before making the decision to continue operations through debt financing. The timing of one-period events between t-1 and t is described in Figure 1.

If the firm decides to continue $X_t = 1$ based on available information about the aggregate shocks at *t* the productivity should be higher to exit threshold: $w_t > w^*$, the continuation needs to be financed. The financing decision depends on the level of accumulated capital and the observed aggregate shocks at t.

The Bellman equation for the resulting mixed discrete-continuous control problem is given by:

$$V(w_t, k_t) = \max_X \left\{ \varphi, \sup_{l_t \geq 0} \pi_t(w_t, K_t) - G(D_t) + \beta \int E[V_{t+1}(w_{t+1}, K_{t+1}) H(w_{t+1}|w)] \right\} \quad (2)$$

Similarly, Winter (1998) used the dynamic approach to study Firm's joint investment and exit decisions as mixed discrete-continuous dynamic problem. The author used Euler equation with applying some technical assumption and particularly a bounded return for unobserved

efficiency index. Using Winter (1998) method based on Euler equation, within the framework of our analysis, gives the following results:

$$\frac{dG(D)}{dD} = \beta \int X_{t+1} \left\{ \frac{d\pi(s_{t+1})}{dK} + (1-\delta) \frac{dG\left(D(s_{t+1})\right)}{dD} \right\} H(ds_{t+1}|s) \qquad (3)$$

where s is the vector of state variables, s= (*k,w)*

In Winter (2012), it is accepted that the construction of closed-form solutions disregards essential financial principles such as the exposure to financial constraints and the nature of cash flows. In order to explain exit decisions beyond the intricacy of firm dynamics and structural model estimation, a real option approach is utilized in the subsequent sections to suggest a precise analytical resolution of the exit problem for an individual business. Following the same rationale of the firm dynamics, a straightforward stochastic model is instituted. In this basic application, the exit decision is studied as a function of capital accumulation, incorporating modifications in debt structure and productivity random shocks which are reflective of random shocks affecting the market structure in the context of the COVID-19 pandemic.

4. Exit real option model

The key concept of this section is to explain the exit decision using the real option approach proposed by Dixit (1993) and Dixit and Pindyck (1994). We present a straightforward reduced form model in which the revenue generated from business activity is a function of productivity that fluctuates randomly in time. By allowing for capital adjustment, the model investigates the relationship between the abandonment point and debt policy. We formulate the exit decision for a company facing two frictions: a convex quadratic debt adjustment cost and a sell-off value, indicating that the decision-maker may also choose to abandon the business in order to limit losses, even when continuing operations would be economically advantageous. Without these financial frictions, the firm can accumulate negative profits indefinitely, which renders the exit option valueless. To keep the model as simple as possible, we make the following assumptions: (1) debt is the only available external financing option, and the firm will be able to reissue new debt without any additional costs such as agency costs or other transaction costs; (2) the firm has no savings or internal cash or

liquidity reserves available to finance its business activities; and (3) no tax shields will be generated by debt interest payment.

The Asset-to-Debt-to-Capital Ratio remains the sole source of growth of the Capital Stock, with Borrowing more by Firms motivated by the need to remain in business and ensure profitable business activity in accordance with Stockholders' requirements. In response to the COVID-19 Crisis, Fiscal Stimulus Policies assume that Financing Decisions are Tax Neutral, thereby rejecting the traditional Trade-Off Theory. This assumption reflects the changes in Financial and Tax Systems resulting from Financing Behaviour and Government Measures. This framework allows for the analysis of the effect of the Leverage Ratio on the Stopping Point.

To solve this Stopping Problem, a Dynamic Programming Approach is used, which consists of two steps: Step 1, assuming that the Value Function is known; and Step 2, solving the Bellman Equation in order to find the Exit Trigger.

We consider a single existing firm active with *K* units of capital stock. Business activity of the firm yields an instantaneous revenue:

$$Y_t(K) = w_t K \tag{4}$$

with w_t the productivity parameter that could also reflect profitability and market efficiency.

For simplification reasons, our revenue function omits labor and instead focuses on capital. We denote by K_0 the initial investment made by the firm to enter the market. The firm faces stochastic market conditions where w_t follows a geometric Brownian process with drift and variance parameter μ and σ *:*

$$dw_t = \mu w dt + \sigma w_t dz_t \tag{5}$$

where dz_t is the increment of a standardized Wiener process (i.e., with mean $E(dz) = 0$ and variance $E(dz^2) = dt$).

Modelling operating revenue as a geometric Brownian motion implies that the current operating revenue is known for a given initial productivity level but future revenues are unknown and are log-normally distributed with a variance that increases with the given time horizon.

Our model assume that capital stock is non-stochastic and "quasi-fixed". At the same time, we assume that capacity may be optimized by allowing change in *K* through debt financing associated with adjustment costs determined by the needed loan D and the capital

stock level for the same period. Based on a large literature related to Q-theory, we model H(.) as the function of debt adjustment cost as a quadratic function of debt-to-assets ratio $L = D/K$. The debt adjustment cost is the cost charged by the creditor when the firm need more debt, in the sense that H(.) allows the firm to grow its capital stock. H(.) is convex and increasing in L. The function of debt adjustment cost can be written as:

$$\text{H(K)}=\frac{\vartheta}{2}\left(\frac{D}{K}\right)^2 K = \left(\frac{\vartheta}{2}L^2\right)K \tag{6}$$

The parameter ϑ measures the cost of additional borrowing mainly interest without any additional costs.

Net revenue at any time t is given by:

$$\pi(w_t, K) = w_t K - \left(\frac{\vartheta}{2}L^2\right)K - C(K) \tag{7}$$

where model $C(.)$ represents the total disbursement associated with capital stock variation $(\rho - n)$ *K,* where ρ*K* is the depreciation of the capital stock, while nK is the periodic amount of the new issued debt.

To avoid liquidity issues during the crisis, we assume that the firm don´t have to repay contracted debt. $C(K)$is defined as:

$$C(K) = (\rho - n)K$$

We are interested in a critical threshold for the stochastic productivity w^*that triggers the market exit. Exit is irreversible and generates a liquidation value φ without an additional exit cost. w^* represents the boundary between the continuation and the exit region.

$$\chi(w) = \begin{cases} 0 \; if \; w_t \leq w^* & continue \\ 1 \quad othewise & Exit \end{cases}$$

The decision problem constitutes an optimal stopping problem that has two state variables the current productivity level and a discrete variable that indicates whether the operation is active or $(\chi = 1)$ or not $(\chi = 0)$. The decision problem can be solved by stochastic dynamic programming.

The objective of the decision maker is to maximize the expected presented value of net profit $\pi(w_t, K)$, where the future cash-flows are discounted at rate δ, with $\delta - \mu > 0$. The convexity of adjustment cost implies that a higher debt level yields a higher debt adjustment cost that constitutes loss of a fraction of revenue. When

firms are highly levered under crisis, it will be too risky to continue business activity with costly debt financing. Capital adjustment through debt financing decisions will be constrained here by the opportunity to earn a liquidation value by exiting the market and selling the firm. The optimal exit policy depends both on revenue and capital stock initial level but also the liquidation value.

As evidenced by Pieralli et al. (2013), in contrast to Dixit (1989) and Dixit and Pindyck (1994), our model does not consider combined entry and exit decisions simultaneously; instead, it focuses on the optimal timing of the exit decision. The difference between these approaches and our model lies in the specification of the profit value function.

Utilizing dynamic programming, we define the value function $V(w_t)$, which represents the value of the expected discounted future cash flows for a current productivity level. Later, we calculate the option to exit for liquidation value φ. With an infinite time horizon, and with fixed initial capital stock K_0, the value of an active firm depends on w. Given the time increment dt, the value of the firm $V(w_t, K)$ or simply $V(w)$ at a certain time t is equal to the sum of the net revenue and expected capital gain over (t; t + dt):

$$\delta V(w)dt = \pi(w)dt + EdV(w)$$

Applying Ito Lemma yields the following familiar partial differential equation (EDP):

$$\frac{1}{2}\sigma^2 w^2 V''(w) + \mu w V'(w) - \delta V(w) + \pi(w) = 0$$

By assuming the linearity of production function, the general solution to this equation is represented as:

$$V(w) = A_1 w^{\beta_1} + A_2 w^{\beta_2} + \left(\frac{wK_0}{\delta-\mu} - \frac{\left(\frac{\vartheta}{2}L^2\right)K_0}{\delta} - \frac{C(K_0)}{\delta}\right), \text{ if } w > w^*$$

The term between parentheses represents the expected present value of the net revenue generated by keeping the firm in the market forever and come from investing initial capital stock K_0 to enter the market. The value of the exit option is given by the first two terms where A_1 and A_2 are two constants to be determined and $\beta_1$and $\beta_2$are respectively the negative and positive roots of the fundamental quadratic equations (see Dixit and Pindyck (1994), with:

$$\beta_1 = \frac{1}{2} - \frac{\mu}{\sigma^2} - \sqrt{\left[\frac{\mu^2}{\sigma^2} - \frac{1}{2}\right]^2 + \frac{2\delta}{\sigma^2}} < 0$$

and,

$$\beta_2 = \frac{1}{2} - \frac{\mu}{\sigma^2} + \sqrt{\left[\frac{\mu^2}{\sigma^2} - \frac{1}{2}\right]^2 + \frac{2\delta}{\sigma^2}} > 0$$

The general solution shows that a decision maker will wait until the value of the firm is lower than the liquidation value B to get out of the market. The value of the exit option will be worthless if productivity is high for the constant A_2 associated with the positive root need to be 0 (zero). The general solution becomes:

$$V(w) = \begin{cases} A_1 w^{\beta_1} + \left(\dfrac{wK_0}{\delta - \mu} - \dfrac{\left(\frac{\vartheta}{2}L^2\right)K_0}{\delta} - \dfrac{C(K_0)}{\delta}\right), if\ w > w^* \\ \varphi \qquad\qquad\qquad\qquad\qquad\qquad , \quad if\ w \leq w* \end{cases}$$

Constant A_1 and the threshold w^* must be determined by the boundary conditions. Thus, the solution of EDP can be obtain by imposing the value matching and smooth pasting condition, at the stopping trigger w^*, we obtain the following equations:

$$V(w^*) = B$$

$$V'(w^*) = 0$$

The conditions above yield:

$$A_1 = -\frac{w^{*1-\beta_1}K_0}{\beta_1(\delta - \mu)}$$

$$w^* = \varphi \frac{\beta_1}{\beta_1 - 1} \frac{(\delta - \mu)\left[\frac{\vartheta}{2}L^2 + (n - \rho)\right]}{\delta}$$

The analytical solution indicates the productivity level at which the firm would optimally exit. According to Dixit (1989), this exit trigger w* implies "how bad things can get" before a business will be

abandoned and where the decision maker knows that one can never restart it later.

5. Numerical results

We can now use numerical simulation of the stochastic productivity evolution to illustrate the impact of productivity uncertainty σ and leverage level L variation on the analytical solution of exit trigger. The base case parameters listed in Table 1 are used.

Table 1

Base case parameters

Parameters	
ϑ	10%
σ	30
μ	0
δ	6%
w_0	100%
K_0	100
D	50
L	50%
Depreciation rate ρ	10%
Debt reissuance rate n	10%
Liquidation value	50

Source. authors' calculation

The impact of productivity uncertainty is captured by the multiple sell-off value $\frac{\beta_1}{\beta_1-1}$, which is lower than unity. The multiple of the selling-value φ decreases in σ (see table 1). This implies, as expected, the exit trigger clearly decreases as the uncertainty increases. Higher variance makes the profitability risk higher and the trigger to exit lower. Table 1 shows the variation the option´s multiple as a function of σ (20%, 30% and 50%), for $\mu = 0$ and $\delta = 6\%$.

Table 2

Multiplier sensitivity to uncertainty

	$\boldsymbol{\sigma = 20\%}$	$\boldsymbol{\sigma = 30\%}$	$\boldsymbol{\sigma = 50\%}$
Beta 1	-1.303	-0.758	-0.354
Multiple of $\boldsymbol{\varphi}$	0.566	0.431	0.262

Source. authors' calculation

Figure 2

Productivity sample paths for σ=50%, 20%

Source. authors'

An increase in the volatility of firm productivity implies that is no longer profitable to stay in the market.

Figure 3

Exit trigger

Source. authors'

Thus, it is surprising that the exit trigger does not depend directly on the initial capital stock level, despite the fact that the continuation payoff is obviously greater for firms with larger capital stocks. W* increases with leverage ratio, implying that firms with higher leverage ratios have a higher exit trigger compared to less leveraged ones. Our model therefore explains not only firms' financing behavior but also their decision to exit. Specifically, when the firm is in the region of optimal continuation, its leverage ratio increases in response to a negative productivity shock. Furthermore, for a given level of capital stock, firms tend to issue new debt to improve their survival chances. The threshold function also reveals that, for a given depreciation rate of the capital stock, w increases with the number of debt units. Consequently, successive units of debt require successively higher thresholds of productivity, which contradicts the theoretical inverse relationship between productivity and leverage.

6. Concluding remarks

In this paper, we developed a dynamic programming model to study the optimal stopping timing in the presence of stochastic productivity. Our model includes debt adjustment cost in the determination of exiters behavior. Inspired by Olley and Pakes (1996) one of the earliest treatments of exit with aggregate fluctuations, we

assumed that exit decision is subjected to productivity uncertainty. To analyze how productivity uncertainty and leverage level jointly affect the exit threshold, we used real options as a natural framework to explain analytically decision regularities in a crisis context. Our extended exit option model, that incorporates debt adjustment cost function, allows us to explain the effectiveness of generous credit policy with the aim of supporting firms to face financial shortfall during the COVID-19 crisis. The framework of the analysis violates the tradeoff theory assumption, which is the tax benefit of debt financing.

The COVID-19 crisis has had a severe impact on firm liquidity, leading to an abrupt financial shortfall and a large wave of exits across markets. In order to protect both employment and firms, governments have implemented credit support programs with flexible terms to provide access to liquidity during the crisis, prompting questions about the relationship between exit decision and a highly leveraged economy. This paper aims to analyze the effect of an increasing leverage level on the decision to exit under productivity uncertainty.

To this end, we developed a dynamic programming model to investigate the optimal stopping timing in the presence of stochastic productivity. Our model considers debt adjustment costs in the determination of exit behavior, and is motivated by Olley and Pakes (1996), one of the earliest treatments of exit with aggregate fluctuations. We assume that exit decisions are subject to productivity uncertainty and use real options to explain analytically the decision regularities in a crisis context. Our extended exit option model, which incorporates a debt adjustment cost function, allows us to explain the effectiveness of generous credit policy in supporting firms to face financial shortfalls during the COVID-19 crisis. The framework of the analysis challenges the tradeoff theory assumption, which states that debt financing has tax benefits.

Our analysis reveals that, as anticipated, uncertainty acts as a motivating factor for firms to leave the market. Specifically, higher volatility reduces the exit threshold and decreases the chances of a firm's survival. However, the exit threshold is an increasing function of leverage ratio for a given initial capital stock. Thus, credit intervention policy remains effective in the crisis situation, not only by providing liquidity, but also by increasing incentives to stay in the market. Our general modelling framework can be extended to take into account the heterogeneity of the COVID-19 effect on productivity by using industry data instead of modelling it as a standard stochastic model. The model

can also be extended by incorporating a Cobb-Douglas technology specification, comprising other input factors that can influence the financing decision. Nonetheless, our model is simple and comprehensive enough to comprehend the exit behaviour in a complex crisis context.

The data that support the findings of this study are openly available in the following references.

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PARENTAL FINANCIAL SOCIALISATION AND SOCIOECONOMIC STATUS[1]

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Abstract

Parental socioeconomic status (SES) is increasingly become important in parental financial socialisation. The main purpose of this study is to determine the difference in parental financial socialisation across parental SES. Parental financial socialisation is measured through parental financial teaching, while parental SES is measured through parental income levels and education levels. Two hypotheses are formulated and tested, H1 states that there is a significant difference in parental financial teaching across parental income levels. H2 states that there is a significant difference in parental financial teaching across parental levels of education. Descriptive statistics Levene's test, Welch robust test, Tukey HSD test and ANOVA are used to analysed data. The results showed that there is a significant difference in parental financial teaching across parental income levels. The results further showed that there is a significant difference in parental financial teaching across parental levels of education. Thus, the overall results indicated that there is a significant difference in parental financial socialisation across parental SES. The study concludes by suggesting interventions that could help parents, government, financial institutions, and other stakeholders to deal with parental SES to improve on parental financial socialisation, which will in turn have an impact on financial literacy and financial well-being of young adults.

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1 This study is based on the author's PhD thesis entitled "The Influence of Parental Financial Socialization on the Financial Literacy of Young Black African Adults in Rural and Low-Income Areas of South Africa".

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1. Introduction

Parental socioeconomic status (SES) has recently gained increasing importance globally, because of its possible effect on parental financial socialisation. The SES of parents has an influence on their role in raising children (Salim & Pamungkas, 2022). Studies have also showed that parents SES has a significant effect on young adult's financial literacy and personal financial management (Ismail, Rowa, Tendean, Huseno & Hartati, 2022; Radianto, Efrata & Dewi, 2019; Homan, 2015). Other studies have linked parents SES with the timing of entry into a first co-residential union, field of study decisions and academic success (Keijer, 2021; Sabri, Gudmunson, Griesdorn & Dean, 2020; Brons, Liefbroer & Ganzeboom, 2017). Thus, parental SES has consistently been found to be an important factor in parents' and young adult's lives. However, it remained to be seen and proven beyond doubt if parents SES play a role in parental financial socialisation. The argument is that there seem to be differences in parental financial socialisation across parental SES. Parents have different SES and thus they might engage in parental financial socialisation differently. Parents who have a higher socioeconomic status tend to have broader insight and are more able to achieve greater income compared to those who has a lower socioeconomic status (Radianto et al., 2019). It is noted that parents with higher income are more likely to get involved in financial socialisation (Serido, LeBaron, Li, Parrot & Shim, 2020). The lack of parental financial socialisation has a tremendous impact on how young adults manage their finances and their overall financial well-being. Thus, it is important that young adults irrespective of their parents SES get the relevant and appropriate parental financial socialisation. Financial socialisation received early in life is positively associated with general saving habits (Boto-Garcia, Bucciol & Manfre, 2022). Young adults must be financially prepared during their transition into adulthood. Parental financial socialisation in childhood has a strong relationship with sound financial practices and asset ownership in young adulthood. Parental financial socialisation remains the main source of financial knowledge among young adults (Wee & Goy, 2022). Further, the young adults whose spending and financial behaviour were observed by parents in

childhood displayed confident attitude towards personal finances (Kim & Chatterjee, 2013). Therefore, if there is something that can hinder parents to engage in financial socialisation it must be established and known so that the necessary interventions can be made to ensure that parental financial socialisation takes place, because it is important in how young adults engage in financial matters. Studies that have investigated the difference in parental financial socialisation across parental SES are very scant, especially in developing countries like South Africa. The few notable studies were conducted mainly in developed countries in Europe (Ekstrom, Tansuhaj & Foxman, 1987; Arikan,1991; Furnham,1999; Jorgensen & Salva, 2010; Serido, Shim, Mishra, & Tang, 2010; Gudmunson & Danes, 2011; Serido et al., 2020). There is no study which has focused on the difference in parental financial socialisation across parental SES in South Africa. The current study will investigate this issue to contribute to literature and to fill the identified research gap. It is important that the difference in parental financial socialisation across parental SES in South Africa be investigated so that the government can come up with programmes to address the gaps in parental financial socialisation. The prominent parental SES noted in literature are parents' income, parental social position or profession and education level (Radianto, et al., 2019; Serido et al., 2020). This study investigate parental SES through parents' income and education level. Parental financial socialisation is investigated through parental financial teaching. The objective of this study was to determine the difference in parental financial socialisation according to parental SES.

The following two hypotheses were tested:

H1: There is a significant difference in parental financial teaching across parental income levels.

H2: There is a significant difference in parental financial teaching across parental levels of education.

The remainder of this article is structured as follows: Sections 2 provides literature review, Section 3 explores research and methodology of the study, Section 4 covers analysis and discussions of the study. Section 6 provides conclusions.

2. Literature review

The theoretical framework for this study dealt with the financial socialisation theory and the family financial socialisation model to better understand the difference in parental financial socialisation across parental SES.

2.1. Financial Socialisation Theory

Danes (1994) introduced financial socialisation theory. The terms *financial socialisation* and *consumer socialisation* are sometimes used interchangeably in literature on the development of children's financial literacy; however, these terms are different. Financial socialisation was derived by Danes (1994) from the definition of consumer socialisation of Ward (1974). Danes (1994) argued that financial socialisation is the process whereby people obtain and develop financial knowledge, values, and behaviour that affect their financial behaviour and money management. This definition of Danes (1994) provides a comprehensive view of financial socialisation and includes the concepts of financial viability and well-being. Thus, financial socialisation is not only about learning financial skills, attitudes, standards, norms, and behaviours from childhood through adolescence, but is more concerned about what the socialisation process contributes to the overall financial well-being of individuals.

The comprehensiveness of financial socialisation is evidenced by the many broad areas of money handling, such as learning about earning, spending, saving, borrowing, sharing, maintaining, and increasing money, insurance, taxes, wills, and investment (Alhabeeb, 1996). According to Fox, Bartholomae, and Lee (2005), saving- and spending behaviours begin to form at an early age. These behaviours start within the family, through both formal and informal methods of teaching. This teaching includes the intergenerational transfer of knowledge, which occurs through observation, modelling, informal discussions, and direct teaching, which can help adolescents and young adults develop behaviours that lead to financial well-being throughout their life (Shim et al., 2010). According to Allen (2008), young adults reported that they learned most of their financial management knowledge and -skills from their parents. Thus, good financial attitudes are significantly related to better financial behaviours such as saving and money management and are negatively correlated to problematic outcomes such as financial distress (Shim, Barber, Card, Xia & Serido, 2010). Financial socialisation is a life-long process

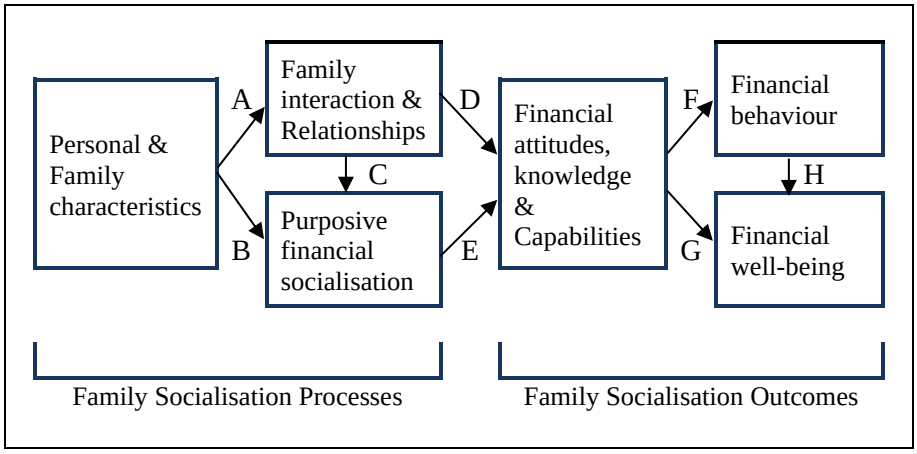
that is influenced by numerous socialisation agents, such as family, teachers, peers, and the media. Factors such as gender, socio-economic conditions of the family and the surrounding community, race, ethnicity, types of financial products that are available, public policies, and macro-economic trends are likely influential in financial socialisation (Gudmunson, Ray & Xiao, 2016).

2.2. Family Financial Socialisation Model

In quest to find a suitable model that would explain financial socialisation Gudmunson and Danes (2011) critically reviewed financial socialisation literature on family studies and financial literacy perspectives. Drawing from Moschis and Churchill's (1978) Conceptual Model of Consumer Socialisation, Gudmunson and Danes (2011) developed the Conceptual Family Financial Socialisation Model to indicate how family financial socialisation impacts financial socialisation outcomes. Their model differs from that of Shim, Xiao, Barber and Lyons (2009) and Shim et al. (2010), as it incorporates *Family characteristics and Family interactions & relationships into financial socialisation.* The model is shown in Figure 1.

Figure 1

Family Financial Socialisation Model



Source: Gudmunson & Danes (2011)

As shown in Figure 1, the model of Gudmunson and Danes (2011) indicates that demographic characteristics are found at personal and family level. Some demographic characteristics, like gender and age, race/ethnicity, and marital status, tend to be most

important on the individual level, while household size, family development stage, and SES tend to be measured at the family level. The model poses demographic characteristics as predictors rather than control variables, and these are tied to financial socialisation through family socialisation processes. The interaction patterns between family members influence financial attitude, knowledge transfer, and financial capability development, even when financial socialisation is implicit (Gudmunson & Danes, 2011).

The model incorporates constructs such as family interpersonal communication, relationship quality, and parenting style to explain and measure family interaction and relationships. Furthermore, purposive family financial socialisation occurs through intentional efforts by family members to financially socialise each other. These efforts vary according to race/ethnicity and nationality. Characteristics such as gender, age, family structure, and family relationship type highlight family roles tied to cultural values and norms that underlie financial practices. The model also contains the paths from financial attitudes, knowledge, and capabilities to behaviour and financial well-being, which are intermediary financial socialisation outcomes indicating socially imbued individual characteristics adapted over time (Gudmunson & Danes, 2011).

The model of Gudmunson and Danes (2011) guided research in financial socialisation; other researchers constructed financial socialisation models based on this model, with some adopting it without change in their studies (Gudmunson & Beutler, 2012; Chowa & Despard, 2014; Tang, Baker & Peter, 2015; Jorgensen, Foster, Jensen & Viera, 2017; Jorgensen, Rappleyea, Schweichler, Fang & Moran, 2017; Antoni, 2018; Fulk & White, 2018; Zhu, 2018; Zhu & Chou, 2018; Kim & Torquati, 2019; Rea, Danes, Serido, Borden & Shim, 2019). These efforts to build an understanding of financial socialisation have been criticised for financial socialisation models seemingly focusing mainly on family interactions and relationships, purposive financial socialisation, and financial socialisation outcomes, with very little attention to the cognition of the child. The main narrative here is that children have different levels of cognitive ability, which will influence how they process financial information. The field of financial socialisation still lacks proper direction due to a lack of consensus on a conceptual model and measurements. The family financial socialisation model remained the widely adopted model by studies in financial socialisation besides its limitations. The current study adopts

this model to better understand parental financial socialisation and parental SES.

Parental financial teaching, an example of purposive financial socialisation, involves the explicit transfer of financial knowledge and skills from parents to children (Rea et al., 2019). Parents socialise their children in financial affairs by directly teaching objective financial knowledge and by consciously and subconsciously sharing their financial norms and expectations. Bucciol and Veronesi (2014) found that adults whose parents taught them to save are more likely to save. Shim et al. (2009) assert that parental financial teaching has a stronger influence on the financial knowledge of first-year college students than financial education in high school and early experience with money. Webley and Nyhus (2013) found that parental financial teaching, such as encouraging children to save and teaching them to budget, has a positive effect on future orientation and saving rates of young adults aged of 18 to 32. Homan (2016) found that young adults who received the most parental financial teaching have fewer loans than those who were never taught. Grinstein-Weiss, Spader, Yeo, Key, and Freeze (2012) assert that greater parental teaching is associated with reduced loan delinquency and foreclosure, as well as with asset accumulation, in young adults.

The SES of parents is considered an important factor in financial socialisation, as it affects the children's relationship with their parents and the children's influence on family decision-making (Moschis & Churchill, 1978). Research suggests that parents' SES may affect three primary methods of financial socialisation, namely modelling, discussions, and experimental learning (Serido et al., 2020). The prominent SES factors noted in literature are parents' income, education level, and occupation. Ekstrom et al. (1987) posited that parents enjoying a high SES may lead to reciprocal financial socialisation, because these parents are more receptive to their children's opinions, and the children therefore have a greater influence on the family's financial decision-making. These children also have more opportunities for economic consumption (Ekstrom, et al., 1987).

Arikan (1991) posited that parents with a high income may be inclined towards luxury consumption motivated by showing off to secure a higher status in the community. Such parents spend their surplus income instead of saving it. This behaviour is then observed by

their children and may manifest in the same behaviours by the children (Arikan, 1991). However, Furnham (1999) found that saving rates are higher amongst children with parents with a higher income. Serido et al. (2020) found a positive relationship between a high parental SES and positive financial practices in childhood and young adulthood. Parents with a higher SES may be more proactive and confident in teaching their children about finances (Serido et al., 2020).

Gudmunson and Danes (2011) assert that income, education level, and occupation underpin parents' ability to foster desirable financial practices in their children, which could lead to better financial outcomes in adulthood. Jorgensen and Salva (2010) found that parents with a higher educational attainment are the primary socialisation agents for college students. The authors note that this may be due to these parents being more likely to communicate with their children and allow them to express their opinions. Serido et al. (2010) argue that a combination of parental income and education plays an important role in parent–child financial interactions, which then impact their development of financial coping behaviours. Parents with college and graduate degrees, high-status occupations (i.e., professionals), and financial wealth can provide more human, social, and financial resources for the development of the child, and are thus better able to foster positive financial practices. These parents are also in a better position to enhance young adult children's asset acquisition through parental access to financial institutions.

Kim and Chatterjee (2013) note that financial problems can have a tremendous impact on the emotions, behaviours, and beliefs of parents, which could influence their socialisation skills and strategies negatively, and also detrimentally affect their financial socialisation practices. According to Sherraden (2013), it would be extremely difficult for parents who lack financial knowledge and expertise to foster positive financial behaviours in their children. Sherraden (2013) adds that parents with a low income are also less likely to socialise their children financially. Thus, children from low-income homes have less experience with money and could be less aware of the range of consumer goods. However, Ward (1974) argued that children from low-income homes are more likely to be skilled consumers, because they have had to learn disciplined use of scarce resources.

From the above conflicting views, it is clear that the difference of parents' SES on the financial socialisation of their children requires further examination.

3. Research and methodology

Positivism is the philosophical assumption underlying this study. The epistemological assumption of positivism holds that meanings reside within entities as objective truth and independent of the human mind (Cohen, Manion & Morrison, 2018). Positivism typically calls for deductive reasoning, a highly structured methodology, large samples, and quantitative measurement, in order to facilitate replication (Gill & Johnson, 2010). This study adopted the quantitative research approach because is associated with methodological principles of positivism, especially when used with predetermined and highly structured data collection techniques. Moreover, it gives the researcher more control over external factors that could influence the research (Adams, Khan & Raeside, 2014). The research design for this study is non-experimental because the setting is not controlled and there is no manipulation of the variables. There is no intervention by the researcher, and it is widely used in quantitative research. This study used self-administered questionnaire which were distributed to respondents' homes to collect data. Questionnaire were design in line with the objective of the study and used existing Likert type scales adopted from literature and also self-constructed scales. The Likert scale consisted of 5-point scales that ranged from strongly disagree (1) to strongly agree (5). Ordinal data questionnaire were use used to collect parental socioeconomic status data.

The population for this study is young adults in South Africa between the age of 18 and 35 because young adults in South Africa are confronted with complex financial decisions and they are in a position to recall some of the financial socialisation by their parents while they were growing up. The sample size for this study is 500 young adults calculated through Yamane's (1967) formula. This sample size was suitable for conducting Exploratory Factor Analysis (EFA) (Krejcie & Morgan, 1970; Tabachnick & Fidell, 2013).

This study used simple random sampling because it afforded all young adults in all provinces of South Africa an equal chance to be included in the sample (Babbie, 2013). South Africa has nine provinces, so a province name was written on a piece of paper, folded placed in a box and picked one by one and ordered the way they were picked. The province which was picked first was visited first then the next province until the sample size was reached. Before data can be collected permission was obtained from the University of South Africa

(UNISA) ethics committee. Young adults were visited at their homes to collect data. Data was collected for a period of three months mainly on weekends to ensure that those who were at schools and work are available and accessible, so that high response rate is achieved. A total of 472 young black African adults completed the questionnaire, this provided a response rate of 94%.

This study measured validity and reliability through construct validity and Cronbach alpha. Construct validity was assessed through EFA by conducting a Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity. The acceptable value of KMO which is suitable and adequate for EFA is 0.50 and above. While Bartlett's test of sphericity is significant for EFA if the significance value is ($p< 0.05$). Factors loadings of ±.30 to ±.40 are minimally acceptable, values greater than ±.50 are generally considered necessary for practical significance (Hair, Black, Babin, & Anderson, 2014). This study retained a minimum factor loading of .30 for interpretation. Cronbach alpha was used to measure reliability, as is the most widely used reliability measure of internal consistency (VanderStoep & Johnson, 2009). Cronbach alpha with a score of 0.60 and more were accepted and considered to be reliable (Cohen et al., 2018). After ensuring reliability and validity data was analysed through descriptive statistics, Levene's test of homogeneity, Welch robust test for equality of means, Tukey HSD test of homogenous subsets and ANOVA.

4. Analysis and discussions

To assess the suitability of data to conduct factor analysis, KMO and Bartlett's test of sphericity was used in this study. Table 1 shows the results of the KMO and Bartlett's test of sphericity.

Table 1

KMO and Bartlett's Test

Factor	Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO)	Bartlett's Test of Sphericity		
		Approx. Chi-Square	df	Sig.
Parental financial teaching	0.768	1924.345	13	0.002

Source: SPSS

Table 1 showed that the KMO for the factor parental financial teaching was 0.768, above 0.60. The p-value of the Bartlett's test for

parental financial teaching is (p=0.000) is smaller than 0.05, is significant. This result is an indication that the correlation structure of construct is adequate to conduct a factor analysis on the items and that the factor is regarded as valid and reliable.

Table 2 shows the results of the EFA, reliability by depicting the Cronbach's alpha, and descriptive statistics for the constructs and factor of the study.

Table 2

Validity, reliability, and descriptive statistics results

Factor	EFA factor loadings			CA	Descriptive Statistics	
Variable	Items	Highest	Lowest	α	μ	SD
Parental financial teaching	6	0.951	0.320	0.909	3.03	1.29

Source: SPSS

Table 2 indicated that one factor was extracted by the EFA, with six items loaded onto the factor as expected, with loadings of above 0.30. The overall factor loadings range from 0.320 to 0.951. The Cronbach's alpha coefficient was above 0.6 and was acceptable and considered reliable. The descriptive statistics provided the mean and standard deviation. Regarding the mean, majority of respondents agreed with the statements measuring parental financial teaching (3.03). The standard deviation of parental financial teaching is high showing that the respondents' responses varied.

The results of the KMO, Bartlett's test, validity and reliability showed that data was reliable and suitable to conduct further analysis. Levene's test of homogeneity, Welch robust test for equality of means, Tukey HSD test of homogenous subsets and ANOVA were used to test the hypotheses of the study.

H1: There is a significant difference in parental financial teaching across parental income levels.

Table 3 shows the results of Levene's test of homogeneity of variance between *Parental income* and the component of *Parental financial socialisation*, namely *Parental financial teaching*.

Table 3

Tests of homogeneity of variances for *Parental income* and *Parental financial teaching*

	Levene statistic	df1	df2	Sig.
Parental financial teaching	13.360	4	467	0.000

Source: SPSS

Levene's test for equality of variance revealed that the component of *Parental financial socialisation* showed different variances across the groups. Parental financial teaching had a *p*-value < 0.05. To determine the difference in the mean scores, the Welch robust test of equality of means was conducted. Table 4 reports the results.

Table 4

Robust tests of equality of means of Parental income and Parental financial teaching

		Statistic	df1	df2	Sig.
Parental financial teaching	Welch	120.663	4	138.585	0.000

Source: SPSS

The test for equality of means revealed differences in mean scores across *Parental income* for *Parental financial teaching*. The *p*-value for parental financial teaching was less than 0.05. The Tukey HSD was used to conduct post hoc tests to show homogenous groups and where the differences lay. Table 5 reports the results of the Tukey HSD test of homogenous subsets.

Table 5

Tukey HSD test of homogenous subsets of the relationship between Parental income level and Parental financial teaching

Parental financial teaching				
Tukey $B_{a,b}$ Income	***N***	**Subset for α = 0.05**		
		1	**2**	**3**
R5 001 – R10 000	131	2.1921		
less than R5 000	152		2.6425	
R15 001 – R20 000	78			3.9274
R10 001 – R15 000	85			4.0000
R20 001+	26			4.0577

Source: SPSS

The results indicated that there were three homogenous groups. Group 1's mean score for *R5 001 – R10 000* (M = 2.192) and Group 2's mean score for *Less than R5 000* (M = 2.642) were lower than the mean scores of Group 3 for *R10 001 – R15 000* (M = 3.927), *R15 001 – R20 000* (M = 4.000), and *R20 000+* (M = 4.057). This means that the higher the parental income is, the more likely it is that the parents will teach their children about finances. ANOVA showed a strong statistically significant relationship between *Parental income* and *Parental financial teaching*, with F = 94.010 and *p* = 0.000. Thus, the results showed that there is a statistically significant difference in parental financial teaching across parental income levels. This result is consistent with results of other studies in this domain (Serido et al., 2010; Jorgensen & Salva, 2010; Gudmunson & Danes, 2011; Kim & Chatterjee, 2013; Serido et al., 2020; Sirsch et al., 2020). For example, Sirsch, Zupancic, Poredos, Levec and Friedlmeier (2020) found that young adults from a wealthier family background reported greater satisfaction with their own money management abilities, perhaps because they can more easily obtain money for unexpected expenditures from their parents. They are more financially socialised than those from poorer family backgrounds, as parents with a high income tend to financially socialise their children more than parents with a low income. Therefore, this hypothesis was accepted.

H2: There is a significant difference in parental financial teaching across parental levels of education.

ANOVA was used to test this hypothesis related to parental level of education and parental financial teaching. Table 6 shows the results of Levene's test of homogeneity of variance between *Parental level of education* and the component of *Parental financial socialisation*, namely *Parental financial teaching*.

Table 6

Tests of homogeneity of variances: Parental level of education and Parental financial teaching

	Levene statistic	df1	df2	Sig.
Parental financial teaching	6.761	5	466	0.000

Source: SPSS

The results showed that *Parental financial teaching* had different variance across the groups, which had a *p*-value of < 0.05.

The Welch robust test of equality of means was used to determine differences in the mean scores. Table 7 reports the results.

Table 7
Robust tests of equality of means for Parental level of education and Parental financial teaching

		Statistica	df1	df2	Sig.
Parental financial teaching	Welch	110.817	5	168.835	0.000

Source: SPSS

The test for equality of means revealed differences in mean scores across *Parental level of education* for *Parental financial teaching*. The *p*-value was less than 0.05. The Tukey HSD was used to conduct post hoc tests to determine homogenous groups and where the differences lay. Table 8 reports the results.

Table 8
Tukey HSD test of homogenous subsets between Parental level of education and Parental financial teaching

Parental financial teaching			
Tukey Ba,b Education	N	Subset for α = 0.05	
		1	2
Grade 12	132	2.1932	
Lower than Grade 12	110	2.2939	
Diploma	74		3.7680
Honours degree	50		3.8767
Bachelor's degree	68		3.9853
Master's degree/Doctorate	38		4.0833

Source: SPSS

The results showed that there were two homogeneous groups for *Parental financial teaching*, which meant that there were differences in *Parental financial teaching* across *Parental level of education*. Group 1's mean scores for *Grade 12* (M = 2.193) and *Lower than Grade 12* (M = 2.293) were lower than Group 2's scores for *Diploma* (M = 3.768), *Honours degree* (M = 3.876), *Bachelor's degree* (M = 3.985), and *Master's degree/Doctorate* (M = 4.083). This means that parents with a higher level of education are more likely to teach their children about finances. ANOVA indicated a significant relationship between *Parental financial teaching* and *Parental level of education level*, with F = 36.453

and p = 0.00. Therefore, there is a statistically significant difference in parental financial teaching across parental level of education. This result is consistent with those of other studies (Shim et al., 2010; Van Campenhout, 2015; Shim, Serido, Tang & Card., 2015; Serido & Deenanath, 2016; Engels, Kumar & Philip, 2020; Zhao & Zhang, 2020; Nomlala, 2021). For example, Engels et al. (2020) indicated that parents' education has a strong correlation with their financial knowledge and influences the quality of their parental financial socialisation. Similarly, Zhao and Zhang (2020) found that parents' education has a positive impact on parental financial socialisation. Thus, parents with a higher level of education are more likely those with lower level of education to engage in financial teaching of their children. Thus, this hypothesis was accepted. Table 9 shows the summary decisions for hypotheses.

Table 9

Summary of hypothesis decisions

Hypothesis	Decision
H1: There is a significant difference in parental financial teaching across parental income levels.	**Accepted**
H2: There is a significant difference in parental financial teaching across parental levels of education.	**Accepted**

Source: Author's own compilation

Table 9 showed the decisions of hypothesis, all two hypotheses (H1 and H2) were accepted. Therefore, because all two hypotheses were accepted, this meant that there is a significant difference in parental financial socialisation across parental SES. These results are consistent with other studies that established a significant difference in parental financial socialisation across parent SES (Serido et al., 2010; Jorgensen & Salva, 2010; Shim et al., 2010; Gudmunson & Danes, 2011; Kim & Chatterjee, 2013; Van Campenhout, 2015; Shim et al., 2015; Serido & Deenanath, 2016; Serido et al., 2020; Nomlala, 2021).

5. Conclusions

The objective of this study was to determine the difference in parental financial socialisation according to parental SES. Levene's test, Welch robust test, Tukey HSD test and ANOVA were used to determine this difference. *Parental SES* was measured through

Parental income level and Parental level of education, while parental financial socialisation was measured through *parental financial teaching*. The results indicated that there is a significant difference in parental financial teaching across parental income level and parental level of education. The results further showed that there is a significant difference in parental financial teaching according to parental level of education. Parents with a high income and higher education tend to financially socialise their children more than those with a low income and lower level of education. Therefore, hypotheses, H1 and H2 were accepted. Thus, the overall results showed that there is a significant difference in parental financial socialisation according to parental SES. Therefore, this study's results are consistent with those of the previous studies. This study contributed to existing knowledge by showing that parental SES is important in parental financial socialisation and must be understood better so that it does not hinder financial socialisation. The contribution of this study will help to shape future discourses in parental financial socialisation and parental SES. There is still need for more studies on parental financial socialisation and parental SES. Therefore, this study recommends that future studies be longitudinal, measuring parental financial socialisation at different stages of life as children grow up. Furthermore, it is recommended that government, financial educators, financial service professionals such as financial institutions, financial counsellors and planners must design programmes aimed at parents with low income and low education level to ensure that they improve on parental financial socialisation. It is very important that these parents understand the importance of their roles in financial socialisation and the impact they have on financial well-being of their children.

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