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# Tax Behavior and Investment Behavior of Corporate Managers: Case of Banks and Decentralized Financial Systems (DFS) in Benin

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**Abstract:** This paper analyses the influence of tax behavior on investment behavior of corporate managers in Benin. The paper applies the generalized method of moments (GMM) to dynamic panel data. The sample used covers 21 firms, i.e. 11 banks for the period from 2011 to 2020 and 10 DFSs for the period from 2016 to 2021. It is found that investment behavior is most positively affected by the tax saving due to the deduction of depreciation allowances on economic assets (EIDDAAE), then by corporate income tax (CIT) and finally by debt (DEBT); and negatively by equity (EQUITY) and past investment (INVESTMENT(-1)). This paper is one of the first to extend the literature by determining the influence of tax behavior on the investment behavior of corporate managers in Benin.

**Keywords:** Corporate income tax savings; corporate income tax behavior; investment behavior; financial objectives, tax objectives.

## 1. Introduction

The influence of corporate managers' tax behavior on their investment behavior remains a major concern insofar as financial decisions are taken for tax purposes rather than on basis of management objectives. Indeed, in their investment behavior, corporate managers give more priority to tax savings than to financial savings. “Aiming at maximizing firm value, financial managers both of small and medium enterprises as of multinational enterprises try to optimize their company’s tax liabilities. Tax considerations regarding location, organizational form, type and timing of transactions enhance the risk that financial decisions are guided by tax purposes rather than management objectives. This is especially true for multinational companies. Although value maximization is the leading principle of financial management, the use of tax planning strategies has a distorting impact on a company’s financing and investment decisions” (Princen 2012: p. 162).

It is true that most corporate income tax systems in countries around the world contain provisions with varying degrees of incentives for financial transactions, with the aim of attracting foreign investors to the country and preventing local investors from fleeing the country. When it comes to corporation tax (CIT), provisions that are more attractive to financial transactions offer CIT savings, while those that are less attractive to financial transactions generate additional CIT charges. All these provisions are contained in the tax codes and encourage corporate managers to optimize CIT. Because corporate tax is

generally considered a business cost, management typically attempts to minimize tax expenditures that significantly affect the firm's operating results and financial position (Landry *et al.* 2013: p. 615-616). In fact, corporate managers have no legal or moral obligation to pay a maximum amount of tax, nor do democratic societies require them to do so (Hasseldine and Morris, 2013). According to Sikka (2010: p. 156), this behavior is perceived as "a normal and commonsensical business practice". In fact, governments appropriate part of the firm's benefits through taxes to the detriment of shareholders and management (Desai *et al.* 2007). Given the key objective of maximizing shareholder value, firms have financial incentives to adopt tax strategies that allow them to minimize their taxes (Landry *et al.* 2013: p. 612).

« While incentives exist to reduce all types of costs, reducing cash out- flows to taxing authorities is expected to be particularly appealing to executives that efficiently manage resources because reductions in tax payments do not have adverse effects on firm operations. For example, firms can cut costs by purchasing lower-quality materials, but this is likely to result in lower-quality products, which increases product returns and diminishes brand reputation. In contrast, firms that purchase high-quality materials can reduce costs through tax savings from favorable transfer pricing arrangements with no effect on product quality. Finally, while cash tax payments do not yield a firm-specific return, cash tax savings allocated to firm operations have the potential to generate a positive return on investment» (Koester *et al.* 2016: p. 1).

In this context, several capital theories have looked at the influence of tax behavior on investment behavior. There are two types of tax savings: debt-related CIT savings and non-debt-related CIT savings. At this point, most theories have focused more on debt-related CIT savings than on non-debt-related CIT savings. For example, Modigliani and Miller's theory (1963) recommends that corporate managers make investments financed entirely by debt capital, as opposed to the tax savings associated with the deduction of interest on debt. However, Baxter's (1967) theory of bankruptcy costs encourages corporate managers to make investments financed by a mixture of equity and debt capital, after arbitrating between the tax savings associated with debt and the bankruptcy costs associated with debt. The agency cost theory of Jensen & Meckling (1976) asks corporate managers to invest taking into account not only the corporation tax savings associated with debt and the bankruptcy costs associated with debt, but also the agency cost of equity capital and the agency cost of debt capital. Finally, the free cash flow theory of Jensen (1986) supports the view that corporate managers who focus their investment behavior on issuing debt capital in order to reduce the level of free cash flow are right.

The tax structure for Benin-based firms is as follows (the list is not exhaustive): Business Profits Tax, Corporate Income Tax (CIT), Synthetic Professional Tax, Withholding Tax, Employer's Payment on Salaries, Motor Vehicle Tax, Tax on Goods and Services, Registration Duty, Stamp Duty, Land Registry Duty and Mortgage Duty, Local Taxes. Of these various corporate taxes, which have more or less an impact on the financial behavior of corporate managers in Benin, only CIT will be the subject of this research. Indeed, the objective of maximizing the wealth of corporate owners depends more on CIT than on other corporate taxes, since most corporate income tax systems allow CIT to be optimized. Overall, the objective of this research is to address the problem of analyzing the influence of tax behavior on investment behavior of corporate managers in Benin. Accordingly, this research will examine the following research questions:

***QR1: What is the influence of CIT savings due to the deduction of depreciation allowances on fixed assets on the investment behavior of corporate managers in Benin?***

***QR2: What influence does cash flow have on investment behavior among Benin's corporate managers?***

***QR3: What influence does debt have on investment behavior among Benin's corporate managers?***

***QR4: What influence does equity have on investment behavior among corporate managers in Benin?***

***QR5: What influence does past investment have on current investment behavior among Benin's corporate managers?***

This paper aims to analyze the influence of tax behavior on investment behavior of corporate managers in Benin, by answering these research questions. We develop rest of the paper in following phases: Section 2 provides a relevant literature review for hypotheses development. Section 3 describes test methods, data and sample. Section 4 presents test results & analysis with implications. Lastly, conclusion is given in the final section of the manuscript.

## 2. Literature review and hypotheses

As stated in earlier section that this paper, using a dynamic panel data, investigates the influence of tax behavior on investment behavior of corporate managers. In this section, we conduct an intensive literature review on the research issue and develop research hypothesis.

### 2.1. Investment theories

This section develops the rational and behavioral theories of investment.

#### 2.1.1. Rational investment theories

The rational theory of investment stipulates that supposedly rational actors make investment decisions by comparing the cost of capital and the expected return. Thus, the tax approach to investment develops the conditions under which tax incentives can reduce the cost of capital and increase the expected return, which can encourage corporate managers to invest more. To this end, three theories have been mobilized. These are the neoclassical financial theory of investment, the Modigliani & Miller theory (1963) and the trade-off theory (TOT).

##### 2.1.1.1. Neoclassical financial theory

According to Charreaux (2000: pp. 3-4), neoclassical financial theory seeks to prescribe normative rules for selecting optimal investments, the objective being to maximize the wealth of shareholders, who are considered the exclusive owners of the firm: they alone and completely hold the rights to make investment (and disinvestment) decisions and to appropriate the flows generated by investments (after remuneration of the other factors of production). In line with this objective, the theory proposes the criterion of net present value (henceforth NPV), which is a measure of the wealth created for shareholders. This criterion makes it possible either to determine the optimal level of investment if it is possible to represent all investment opportunities in the form of a continuous curve - relating the flows from investments to the amounts invested - or to decide on the acceptability of an investment or, in a situation of exogenous capital rationing, to choose between different projects. In the first case, the level of investment is optimal: the value created for shareholders is maximized when the additional NPV provided by the marginal investment franc is zero. In the second case, a project is acceptable and should be undertaken if it makes a positive contribution to increasing shareholder wealth, i.e. if its NPV is positive. In the case of capital rationing, the choice of project package is made in such a way as to maximize the sum of the NPVs of these projects, the NPVs being additive.

This normative approach is based on a representation that has its origins, first and foremost, in the representation of the investment decision in the model of the American economist Irving Fisher (1867-1947), and then in its extension by risk assessment models.

#### 2.1.1.1.1. Neoclassical financial theory in the absence of risk

Fisher (1930) proposed a model which ignored risk and which served as the basis for the theory of corporate investment budgeting. The assumption that there is no risk means that there is no need to distinguish between the different categories of providers of resources (shareholders, creditors, etc.). The cost of financing - the "cost of capital" - is equal to the single interest rate prevailing on the financial market, which is deemed to be competitive. The company's investment opportunity curve is completely independent of the players and reflects the state of the technology: it is perfectly known. The optimal level of investment is determined when the marginal rate of return on investment and the marginal cost of capital are equal. This level, which results solely from the comparison of objective factors (the shape of the investment opportunities curve and the market interest rate), is itself objective. It follows, firstly, that there can be no divergence between shareholders in the choice of the optimum (unanimity rule) and, secondly, that the choice decision (perfectly controllable) can be delegated to the manager. The latter, the perfect agent of capital providers, acts "automatically" and has no latitude.

The NPV of an investment represents the additional wealth that shareholders will be able to consume, the ultimate objective being to maximize the utility associated with consumption. This NPV is obtained by discounting operating cash flows at the financial market interest rate, less the amount of capital invested. At the optimum, i.e. for the marginal investment franc, value creation, measured by the NPV, is zero. According to this representation, wealth creation is totally independent of shareholders' particular preferences in terms of intertemporal consumption. Given the level of wealth created, the financial market makes it possible to maximize the intertemporal utility of consumption by simple transfer, by means of borrowing and lending transactions underpinned by financial securities. The valuation of wealth created requires the existence of a financial market that acts as a benchmark. Value is created because the investments made yield more than a simple investment on the financial market (or the cost of financing them). Managers have an interest in investing in physical assets as long as the marginal rate of return is higher than the marginal cost of capital, i.e. as long as the investment is profitable and there is an income, which is certain in the representation adopted. At no point is the formation of the rent questioned.

#### 2.1.1.1.2. Neoclassical financial theory in the presence of risk

According to Charreaux (2000: p. 6), the concept of risk used in neoclassical financial theory is a special one. In relation to investment, risk arises from the *ex-ante* variability of flows as a function of the state of the world. The probabilities associated with different states are assumed to be known, at least subjectively, and players are able to construct a probability distribution of flows. Unlike the notion of uncertainty as defined by the economist Frank Hyneman Knight (1885-1972), which cannot be quantified even in probabilistic terms, the notion of risk remains "low", in the sense that it can be assessed by the players involved. The adjustments made to neoclassical theory, to enable it to incorporate this notion, do not alter the representation of investment. The only concern remains the valuation of the flows resulting from the investment and of the securities held by the providers of capital as rights to the appropriation of the flows.

The two main models that have made it possible to incorporate risk into this valuation are the Arrow and Debreu model (1953, 1959) and the CAPM (Capital Asset Pricing Model), developed in particular by Sharpe (1965) and Lintner (1965). These two models are based on an assumption of substantial rationality on the part of players, which provides a representation of risk that can be quantified. In Arrow and Debreu's model, actors are able to predict all states of the world and associate a probability with them. In the CAPM, they are supposed to be able to directly establish a probability distribution for the various flows. Risk is therefore apprehensible and quantifiable ex ante; uncertainty in Knight's sense

does not exist in this type of model. The assumptions concerning the financial markets (completeness, efficiency) make it possible to establish an objective price for risk on the markets, independent of the individual preferences of the players. The markets therefore continue to play a central role in the valuation process by making it possible to "objectively" quantify the value of securities.

Taking risk into account does not significantly alter the representation of the investment decision in neoclassical theory. Since investment flows are given exogenously, and markets are complete, the only remaining problem is valuation, the solution to which, based on the valuation of securities by markets, is relatively trivial. More 'recent' developments in neoclassical financial theory, such as the introduction of taxation, bankruptcy costs, agency costs and the application of options theory to the valuation of investments, do not call into question this representation of the investment decision as a simple problem of valuing the securities that give entitlement to the flows generated by investments, these flows being assumed to be independent of decisions on the distribution and sharing of the wealth created.

#### 2.1.1.2. Modigliani and Miller's theory (1963)

The theory of Modigliani and Miller (1963) indicates that CIT savings, in this case those linked to debt capital, reduce the weighted average cost of capital and increase the value of capital. Consequently, these authors recommend that company managers increasingly adopt investment behaviour that finances more debt capital than equity capital, in order to maximise CIT savings. Certainly, between debt and equity, equity financing has a greater cost than that of debt financing especially when there is a lower interest rate whilst debt financing has an advantage that is called tax shield (Dhankar, 2019; Le & Phan, 2017; Wachter, 2020). In this respect, Modigliani and Miller (1963) argue that firm value increases with higher leverage due to the corporate tax shield. The reason is that interest on debt capital is tax deductible, and thereby decreases the net tax payment. This might result in an added benefit of using debt capital by lowering overall cost of capital (Hossain 2021). Therefore, Modigliani and Miller' (1963) theory concludes that levered firms (in a perfect market) have more value than non-levered firms. But it is a pure fiscal illusion for Modigliani and Miller to reach such a conclusion. In fact, any tax gain due to tax incentives on investment at the level of a firm eligible for tax incentives actually generates after arbitrage, an equivalent tax loss due to tax incentives on investment at the level of another identical firm not eligible for tax incentives; the two firms belong to the same class of financing risk.

Nonetheless, the existing corporate finance literature hardly provides global empirical evidence on the impact of financial leverage on firm value (Hossain 2021). Solomon (1963: p. 276) argues that, in an extreme leverage position, the cost of capital must rise. This is because excessive levels of debt will induce markets to react by demanding higher rates of return. Therefore, to minimize the weighted average cost of capital, firms will avoid a pure debt position and seek an optimal mix of debt and equity. Moreover, Kim (1978: p. 45) observes that during the period between 1963 and 1970, non-financial firms in the United States were financed by only one-third of debt. This finding provides circumstantial evidence that, in the presence of taxes, firms will avoid a pure debt position.

#### 2.1.1.3. Trade-off theory (TOT)

According to Kaur (2014: p. 40), the trade-off theory has been developed by various authors as a consequence of debate over Modigliani-Miller theorem. This theory's main proposition has been that a firm evaluates various costs and benefits of alternative capital structures (with different leverage position). For Ali *et al.* (2013: p. 705), the trade-off theory (TOT) says that firm's adjustment towards optimal leverage which influenced by three factors namely taxes, costs of financial distress and agency costs. (a) ***Taxes***: Interest, being a tax-deductible expense, decreases the tax liability and increases the after-tax cash flows. Firms in their attempt to increase cash flows and market value will remark on

higher level of debt if the tax rate is high. Thus, tax rate and leverage have positive relationship. (b) ***Agency costs***: The costs of monitoring the managers so that they act in the interests of the shareholders are referred as Agency Costs. The higher the need to monitor the managers, the higher the agency costs will be. All cash inflows in profit should be returned to the shareholders, for example though dividend payouts (Jensen, 1986). (c) ***Bankruptcy Costs***: The possibility of default on debts increases with the increase in level of debt beyond the optimal point. Should the firm default on repayment of loans; the control of the firm will be shifted from shareholders to debt holders who will try to repossess their investment through the process of bankruptcy. Because of the possible financial distress caused by the higher level of leverage, a firm may face two types of bankruptcy costs. They are direct costs and indirect costs. Direct costs include the administrative costs of the bankruptcy process. The indirect costs arise because of change in investment policies of the firm encase the firm foresees possible financial distress. But the TOT of capital structure has a static and dynamic version.

#### 2.1.1.3.1. Static trade-off theory (STOT)

The static trade off theory says that firm has optimal capital structure which is determined by trading off the costs against the benefits of the use of debt and equity (Ali *et al.* 2013: p. 705, Kaur 2014: p. 40). Debt though provides tax advantage but has cost in the form of financial distress associated with it. This leads to trade-off between tax benefits and financial distress cost. The other cost involved is agency cost. Agency costs occur due to conflict of interest between different stakeholders of firm due to asymmetric information (Jensen and Meckling 1976, Jensen 1986). So, the firms target their capital structure as a trade-off among various costs and benefits like tax advantage, financial distress and agency cost.

Warner (1977) questioned whether bankruptcy costs are large enough to be significant. Myers (1977) argued that trade-off theory is '*not complete and sensible explanation of corporate debt policy*'. He assumed that firms are valued as going concerns and their valuation reflects the expectation of continued future investment. According to his theory, there is no direct relationship between debt financing and financial distress cost. The extent of leverage in the firm is inversely related to ratio of discretionary expenditures to total asset value.

#### 2.1.1.3.2. Dynamic trade-off theory (DTOT)

The dynamic trade-off theory recognizes the role of time requires specifying a number of aspects that are typically ignored in a single-period model. This theory considers that the correct financial decision depends on the financing margin that the firm anticipated in the next period (Kaur 2014: p. 40). According to Ali *et al.* (2013: p. 706), some firms expect to pay out funds in the next period, while others expect to raise funds. If funds are to be raised, they may take the form of debt or equity. More generally, a firm undertakes a combination of these actions. An important precursor to modern dynamic trade-off theories was Stiglitz (1973), who examines the effects of taxation from a public finance perspective. Stiglitz's model is not a trade-off theory since he took the drastic step of assuming away uncertainty. Kane *et al.* (1984) and Brennan and Schwartz (1984) provided dynamic trade-off models with tax savings and bankruptcy costs. They analyzed continuous time models with uncertainty, taxes, bankruptcy cost. They assumed no transaction cost for financial decision making. According to them, firms react to adverse financial conditions and rebalance their debt position and maintain high levels of debt to gain tax savings. Goldstein *et al.* (2001) and Brennan and Schwartz (1984) considered this situation as option value embedded in leverage decision for the next period. So, firms with an option to increase leverage in the future tend to move away from optimal capital structure today.

### 2.1.2. Behavioral Investment Theories

"Behavioral finance is a relatively recent research discipline based on psychology. The individuals considered in the models it proposes make investment choices in the presence of risk or uncertainty. The analysis of their behavior makes perfect sense" (Snineh and Mesk 2021: p. 962). For Sewell (2001), behavioral finance is the study of the influence of psychology on the behavior of financial practitioners and the subsequent effect on markets. Behavioral finance helps explain *why* and *how* markets might be inefficient. According to Henriques (2011: pp. 48-56), Behavioral Investment Theory consists of six foundational principles that are well established in the animal behavioral literature; however, they are often studied by different disciplines and paradigms that adopt different emphases and are often needlessly defined against one another or at the very least are disconnected from one another. These six foundational principles of (1) energy economics, (2) evolution, (3) genetics, (4) computational control, (5) learning, and (6) development make up Behavioral Investment Theory, which in turn provides a unified, holistic framework for understanding animal behavior. Malcolm Baker, Richard Ruback et Jeffery Wurgler said that behavioral approaches help explain a number of important financing and investment patterns (Eckbo 2007: p. xi).

Three behavioral theories of investment have been developed. These are Barton & Gordon's Strategic Theory (1987), Williamson's Transaction Cost Theory (1988) and Baker & Wurgler's Market Timing Theory (2002).

#### 2.1.2.1. Barton & Gordon's Strategic Theory (1987)

Adopting the approach of Andrews (1980) and Mintzberg and Waters (1982), strategies are defined as realized patterns in streams of decisions or actions, reflected in the objectives and policies of the firm. Strategy crystallizes in the nature and range of business activities of the firm, the economic and human organization that will emerge in the process and the interaction that the firm will have with stakeholders. Barton and Gordon (1987), arguing that finance and economic theories cannot fully explain a firm's capital structure, suggest a 'strategy perspective' for understanding the capital structure of a firm. Even though Barton & Gordon's (1987, 1988) strategic capital structure theory does not explicitly link to behavioral finance, it must be acknowledged that there is a congruence with behavioral finance as it analyses the influence of psychological and sociological aspects on "the behavior of financial practitioners" (Sewell 2007: p. 1). Corporate strategy is identified as those actions and plans which influence the portfolio of different activities in which the firm is involved. Frequently this concerns the extent to which the firm diversifies away from its core business. Mintzberg and Quinn (1991) develop this view of corporate strategy by identifying generic strategies that are distinguished by their distance from the central and original focus of the firm's activities.

Corporate strategy identifies investment opportunities and growth areas. Financial strategy evaluates these opportunities, considering the financial feasibility, expected returns, and risk profiles, to make informed investment decisions. The importance of this view of corporate strategy is reinforced by much of the empirical evidence on the failure of mergers and acquisitions to deliver to shareholders the value of the synergy and risk spreading frequently used as the rationale for merger activity. An investment strategy is a set of principles that guide investment decisions. There are several different investing plans corporate managers can follow depending on their risk tolerance, investing style, long-term financial goals, and access to capital. The best investment strategy is the one that helps corporate managers achieve their financial goals. A review of some of the top investors will show that for every investor, the best strategy will be different. For example, if corporate manager is looking for the quickest profit with the highest risk, momentum trading is for him. Alternatively, if he is planning for the long-term, value stocks are probably better.

Up until now, studies measuring the impact of corporate strategy on the capital structure have found mixed results and the majority of them have focused on only one corporate strategy dimension at a time, i.e., integration (Harrison, Love, & McMillan, 2004; Javorcik & Spatareanu, 2009), diversification (Chkir & Cosset, 2001;Jouida, 2018;Kochhar & Hitt, 1998; McMillan & Woodruff, 1999; Menéndez-Alonso, 2003; Singh, Davidson, & Suchard, 2003) or internationalization (Agmon & Lessard, 1981; Chkir & Cosset, 2003, 2001; Fatemi, 1988; Singh et al., 2003; Singh & Nejadmalayeri, 2004; Williamson, 1988). Moreover, the more the puzzle is pieced together, the more the results and research appear to be mixed and inconclusive, as highlighted by Rehman and Rehman (2011).

#### 2.1.2.2. Williamson's Transaction Cost Theory (1988)

According to Young (2013), transaction cost theory (Williamson 1979, 1986) posits that the optimum organizational structure is one that achieves economic efficiency by minimizing the costs of exchange. The theory suggests that each type of transaction produces coordination costs of monitoring, controlling, and managing transactions. Williamson has defined transaction costs broadly as the costs of running the economic system of firms. He has argued that such costs are to be distinguished from production costs and that a decision-maker can make a choice to use a firm structure or source from the market by comparing transaction costs with internal production costs. Thus, cost is the primary determinant of such a decision. For Charreaux (2006: p. 125), although transaction cost theory has a number of similarities with agency theory, Williamson's analysis of financing policy leads to a very different conception of the financing decision. Drawing on the traditional framework of transaction cost theory, Williamson analyses the financing decision as a specific transaction in which the degree of specificity of the asset financed plays a central role. Debt and equity are no longer considered as financial instruments and analyzed in terms of their respective agency costs, but as governance structures for the specific transaction of financing an investment.

The theory of transaction costs developed by Williamson (1988) is based on two assumptions:

- agents have only *bounded rationality*, which means that they are unable to be fully informed and to understand and anticipate the reactions of workers, customers, suppliers, competitors or any other stakeholder;
- agents behave *opportunistically*, i.e. they are prepared to lie or cheat to defend their interests.

Transactions initiated and concluded by human beings endowed with uncontroversial behavioral axioms (bounded rationality and opportunism) have attributes that are essential elements for the trade-off between modes of governance (Ghertman 2003: p. 45). To this end, Williamson (1988) defines three modes of governance in which transactions can be conveyed: the market (price system), hybrid forms (contracts) or by the firm (within the organization itself) and uses three attributes of transactions: "*asset specificity*", "*uncertainty*" and "*frequency*". Thus, according to Kartobi (2013), when it comes to financing an asset that is not very specific, it is more appropriate to resort to debt because, in the event of bankruptcy, this asset can always be sold at a good price. This encourages creditors to take part in its financing. Similarly, the cost to the company will not be high. Furthermore, when the asset to be financed is too specific, it is not in the company's interest to go into debt. Creditors know that the value of the asset will be very low once it has been acquired, and that it will be difficult to find a buyer in the event of bankruptcy. In this case, the creditors will demand a high-risk premium and will adjust the loan contract to protect themselves against the risk of non-repayment.

Reflecting upon nearly four decades of empirical research, Williamson (2000, p. 605) concluded that "transaction cost economics (TCE) is an empirical success story" in that it had achieved its main objectives of producing testable empirical predictions. Covering all the achievements and contributions is beyond the scope of our exposition here, we direct instead the reader to the thorough, systematic reviews of the TCE literature by Joskow (1991), Shelanski and Klein (1995), Rindfleisch and Heide (1997), Silverman (2017), Mahoney (2005), and Macher and Richman (2008). The overarching

conclusion echoed in these reviews is that empirical data have largely corroborated TCE: both case studies and the examination of tendencies in large statistical samples show that economic transaction efficiency can be used to account for the choices about how transactions are governed. Uncertainty, frequency, and asset specificity link to governance decisions in a way that TCE predicts (see the cited literature reviews for hundreds of empirical examples).

But transaction cost theory has also been the subject of much criticism in the management literature. According to Ketokivi and Mahoney (2017: p. 13), transaction cost theory became the target of aggressive criticism in the 1990s from management scholars in other disciplines (Ghoshal 2005, Ghoshal and Moran 1996, Pfeffer 2005). Critics argue that this theory is "bad for practice" (Ghoshal and Moran 1996: p. 13), has "deleterious effects" (Pfeffer 2005: p. 97), and even has the potential to "destroy good management practice" (Ghoshal 2005: p. 75).

As a result, the company can either give up its specific assets to satisfy its creditors, which reduces its value and damages its economic interests, or resort to equity financing. This second solution is the one envisaged by transaction cost theory.

#### 2.1.2.3. Baker & Wurgler's Market Timing Theory (2002)

Other theory of capital structure includes Market Timing Theory pioneered by Baker and Wurgler (2002). According to Danso & Adomako (2014), the Market Timing theory is quite new and therefore, small numbers of studies have been conducted to test its validity. The Market Timing theory of capital structure assumes that firms time their equity issues whereby they will issue new stock when the stock price is perceived to be overvalued (high price), and repurchase their shares when there is undervaluation (low price) (Luigi & Sorin 2009, Mostafa & Boregowda 2014 and Baker and Wurgler 2002). As a result, fluctuations in stock prices will affect firm's decision on capital structures. There are two versions of Equity Market Timing.

One is a dynamic version of Myers and Majluf (1984) with rational managers and investors (Baker & Wurgler 2002). Manager expected to issue equity directly after a positive information release which reduces the asymmetry problem between the firm's management and stockholders. The decrease in information asymmetry will result with an increase in the stock price (Luigi & Sorin 2009). This theory indicates that firms create their own timing opportunities to finance their project (Luigi & Sorin 2009). The extent of adverse selection varies across firms or across time and is inversely related to the market-to-book ratio (Baker & Wurgler 2002).

The second version of Equity Market Timing involves irrational investors (or managers) and time varying mispricing (or perceptions of mispricing) whereby managers issue equity when they believe its cost is irrationally low and repurchase equity when they believe its cost is irrationally high (Baker & Wurgler 2002, Luigi & Sorin 2009). The second version of Market Timing does not require that the market actually be inefficient and it does not ask managers to successfully predict stock returns (Luigi & Sorin 2009). This story explains the results if variation in the market-to-book ratio is a proxy for managers' perceptions of misevaluation (Baker & Wurgler 2002). The assumption is simply that managers believe that they can time the market. In a study by Graham and Harvey (2001), managers admitted trying to time the equity market, and most of those that have considered issuing common stock report that "the amount by which our stock is undervalued or over- valued" was an important consideration.

Evidence for market timing comes from a variety of different sources. Starting with Taggart (1977), several studies demonstrate the tendency of firms to issue equity when their market valuations are high relative to book values or past market values. "This line of research utilizes forward-looking market timing measures. Proper interpretation of the findings is made difficult by the confounding effects of other determinants of financing policy. An alternative approach to detecting overvalued equity sales is

to analyze the subsequent stock return performance of issuers" (Alti 2006). Ritter (1991) and Loughran and Ritter (1995) document that IPOs[1] and seasoned equity issues underperform their benchmarks in the long run.

In recent work, Kayhan and Titman (2007) also make the point that the significance of the historical market-to-book series in leverage regressions may be due to the noise in the current market-to-book ratio. Specifically, Kayhan and Titman decompose the external finance weighted average market-to-book ratio into the mean market-to-book ratio and the covariance between the market-to-book ratio and the financing deficit. They show that the persistence result of Baker and Wurgler is mainly driven by the persistence of the average market-to-book ratio rather than the covariance between the market-to-book ratio and the financing deficit.

Similarly, Leary and Roberts (2005) argue against history effects by providing evidence that firms attempt to rebalance leverage to stay within an optimal range. Developing a different line of criticism, Hennessy and Whited (2004) question the interpretation, rather than the robustness, of history effects on capital structure. Hennessy and Whited (2004) show that a dynamic trade-off model with no market timing opportunities is able to replicate the empirically observed link between the historical market-to-book series and current leverage. In their model, a high market-to-book firm finances growth with equity to avoid financial distress.

### 2.2. Formulating research hypotheses

According to Sadik and Benghazala (2022: pp. 389-390), the envisaged need to promote tax incentives for business investment as an instrument of economic policy will, however, generate an obvious component capable of considerably distorting the allocation of resources within the firm. Indeed, the existence of tax incentives for investment can redirect the strategy of firms by making profitable investment projects which, under conditions of homogeneous effective taxation, would not be profitable (Espitia et al. 1989a: p. 106). Similarly, Boadway and Shah (1995: p. 57) link tax incentives to investment decisions, the effect of which on the cost of funds employed will affect the composition of the firm's financial structure. Thus, tax incentives play a major role in a firm's financial decision making, and it can be seen that a change in the tax system will lead to significant changes in a firm's financing behavior (Virolainen 1998: p. 124). Another aspect that emerges from the application of these instruments is that they can improve the solvency of the company if the incentives affect self-financing (Mato 1989, Del Villar 2004), and can sometimes condition growth in productivity and company size (Mamuneas and Nadiri 1996, Cummins 1998).

However, the disparity in the results that emerge from the study of tax incentives for investment makes a review of the literature on the effects of these incentives an arduous and difficult task, given the diversity of criteria, methodologies and points of view, which do not always coincide. Nevertheless, in general, the evidence suggests that taxes have a significant effect on investment. In this sense, Hines (1999: p. 309) states that for every percentage point reduction in the corporate tax rate, FDI (foreign direct investment) increases by around two percent. Similarly, Romero Jordan (1999: p. 37) comments that despite the measurement problems that arise in studying the effectiveness of tax incentives, the latter, even if they are not major players, do have some impact on investment.

Liu and Mao (2019) explored a unique firm-level dataset from years 2005–2012 and utilized a quasi-experimental design to test the impacts of the reform on firms' investment and productivity. The authors

[1] The term hot IPO refers to an initial public offering with significant demand. These IPOs are popular, drawing a tremendous amount of interest from investors and the media even before they hit the market. This hype and attention generally lead to a significant rise in share prices after the company goes public.

found that, on average, the reform raised investment and productivity of the treated firms relative to the control firms by 38.4 percent and 8.9 percent, respectively. The same authors also showed that the positive effects tend to be strengthened for firms with financial constraints.

Overall, through this review of related literature, the approaches used by different investment theories can be grouped into two or even three categories: the full rationality approach, the bounded rationality or bounded irrationality approach and the full irrationality approach. But this list of investment theory approaches is not exhaustive, as there may be other approaches on the continuum from full rationality to full irrationality. This research is part of an approach that is closer to rational investment theory than to behavioral investment theory. The relationships between corporate income tax (CIT) behavior through fiscal or financial variables and investment behavior are elucidated.

### 2.2.1. Relationship between CIT savings due to amortization and investment

From an accounting point of view, capital expenditure is spread over several tax years. The depreciation schedule for a fixed asset is calculated when the asset is brought into service, to take account of the fact that it will be used for several years. Depreciation is an accounting technique used to record the reduction in value of a fixed asset due to wear and tear and the passage of time. Depreciation is a way of reducing a company's taxable income without draining its cash flow. The reduction in profit *de facto* leads to a reduction in corporate income tax (CIT). This tax advantage benefits companies that invest in depreciable fixed assets. The principle of cashless expenses and a lower tax base boosts cash flow. According to Wen (2020: p. 3), exceptional depreciation (or, in its most extreme form, immediate expensing, i.e. 100% exceptional depreciation) reduces the taxable portion of income by allowing more capital expenditure to be deducted from tax in the current year than under the normal depreciation schedule.

From an empirical point of view, Koester *et al.* (2017: p. 1) investigate whether executives with superior ability to efficiently manage corporate resources engage in greater tax avoidance. Their results show that moving from the lower to upper quartile of managerial ability is associated with a 3.15% (2.50%) reduction in a firm’s one-year (five-year) cash effective tax rate. The same authors examine how higher-ability managers reduce income tax payments and find that they engage in greater state tax planning activities, shift more income to foreign tax havens, make more research and development credit claims, and make greater investments in assets that generate accelerated depreciation deductions. Vartia (2008: p. 2) analyses how different tax policies can affect investment and productivity. To address this question this author uses industry-level data from a set of OECD countries and examines whether different industries are affected differently by taxation. As result, investment is shown to respond negatively to an increase in the corporate tax rate and a decrease in capital depreciation allowances through changes in the user cost of capital. Finally, the trade-off theory predicts that firms with more taxable income and relatively few non-debt tax shields such as investment tax credits and depreciation will have more incentives to borrow (DeAngelo & Masulis, 1980: p. 4). Therefore, in order to take advantage of the interest tax shields, firms with fewer non-debt tax shields should be expected to borrow more. Conversely, firms with more non-debt tax shields should have less debt in their capital structure. In Benin, investments in depreciable fixed assets offer the firm CIT savings due to amortization allowances deduction for fixed assets in computing CIT (See articles 38 to 40 of the Benin General Tax Code for the year 2024). Thus, in the light of this review of related literature, the first hypothesis is formulated as follows:

*H1. "CIT savings due to the deduction of amortization allowances for fixed assets, affect positively investment behavior in tangible assets of corporate managers in Benin".*

### 2.2.2. Relationship between cash-flow and investment

A firm's cash flow is a key indicator revealing the current and future state of its cash flows, essential to understanding its financial health. This concept is based on the difference between cash received and cash paid, and on cash flow from operations, which adjusts net profit to reflect potential cash flow. Cash flow is crucial not only for repaying loans but also for anticipating future investment needs, underlining its importance in a firm's growth strategy. Controlling these flows helps to avoid difficult financial situations and to plan calmly for the future. In the context of free cash flow theory, Jensen (1989) states that when free cash flows are available to top managers, they tend invest in negative NPV projects instead of paying out dividends to shareholders. He argues that the compensation of managers with an increase in the firm's turnover. Hence the objective of the company is to increase the size of the firm by investing in all sorts of projects even if these projects have a negative NPV. Dorff (2007) argued that compensation of managers tends to increase when there is an increase in the firm's turnover. Jensen (1986) defines free cash flow as the amount of money left after the firm has invested in all projects with a positive NPV and states that calculating the free cash flow of a firm is difficult since it is impossible to determine the exact number of possible investments of a firm. Lang *et al.* (1991) uses the Tobin's q as a proxy to determine the quality of investment. Firms with a high 'q' showed that firms were using their free cash flows to invest in positive NPV projects whereas firms with low 'q' showed that firms were investing in negative NPV projects and therefore, the free cash flows should instead be paid out dividends to the shareholders. Boodhoo (2009: p. 5) can conclude that using free cash flows to invest in negative NPV projects leads to an increase in agency costs.

In short, cash flow is made up of net profits and provisions & depreciation. In Benin, capital gains on disposals of fixed assets form part of cash flow and are deductible from CIT if corporate managers undertake to reinvest them in fixed assets (see Article 17 on the capital gains regime in Benin's General Tax Code). Under these conditions, capital gains on the disposal of assets and depreciation allowances for fixed assets that will be reinvested are deductible in computing CIT. In this case, the cash flows therefore generate CIT savings due to the deduction of these capital gains and allowances in the CIT computation. Thus, in the light of this review of related literature, the second hypothesis is formulated as follows:

*H2. "Cash flow affects positively investment behavior of corporate managers in Benin".*

### 2.2.3. Relationship between debt and investment

According to Wen (2020: p. 3), immediate expensing, without deduction of interest and at a constant tax rate, ensures the neutrality of the tax system for investments, which means that any investment that was profitable in the absence of tax will still be profitable after tax. It is easy to understand, then, that such a system makes the State the de facto sponsor of all private investment, bearing the costs in the same proportion as it shares the profits. Immediate expensing, if accompanied by other provisions such as the deduction of interest, even amounts to subsidizing investments. Myers (1977) and MacKie-Mason (1986a) examine a conflict over investment decisions which outstanding debt may induce. Management will commit new resources to a project only if the expected return is sufficient to pay off the outstanding debt liabilities, as well as earn an acceptable return on the new investment costs, if the alternative is low-cost default. Since the first-best is to go ahead if the expected payoffs are sufficient to earn a return on the incremental costs, underinvestment results, which raises the equilibrium cost of borrowing. Jensen and Meckling (1976) suggest that firms with high debt levels and limited liability will have an incentive to take on excessively risky projects. Risky projects with limited liability offer a call option to shareholders: high payoffs in good states, zero payoff in bad states. Taking on a risky project when debt is high can transfer wealth from bondholders to shareholders. Other costs of financial distress associated

with borrowing include contracting, bonding and monitoring costs necessary to ameliorate both operating and investment decision agency problems (Jensen and Meckling 1976) and unfavorable terms of trade with customers, workers and suppliers due to distorted liquidation incentives (Titman 1984).

MacKie-Mason (1988) studied the effects of tax policy on corporate financing choices using a new empirical method and a different data set from previous studies. He used a sample containing 1418 observations from 1977 to 1984, covering new registrations of 613 different firms. This sample investigated financing decisions using a data source not previously used to study capital structure decisions: new public securities registrations with the SEC. The results provide some of the first clear evidence that tax policy significantly affects financing decisions. The higher a company's non-debt tax premiums (e.g. investment tax credits, tax loss carryforwards), the less likely it is to issue debt at the margin, as the expected tax premium 'crowds out' the value of interest deductibility.

In reality, debt interest deduction in computing CIT only results in an unpremeditated diversion of income in favor of firms with non-zero financial leverage to the detriment of firms with zero financial leverage; the effect remaining cancelled out at the level of the State which has granted this tax deduction (Agossadou, 2023). This is a real tax injustice which does not say its name, but which is reinforced by certain authors who recommend that corporate managers adopt investment behavior financed more by debt (Modigliani and Miller 1963, Baxter 1967, Jensen & Meckling 1976, Ross 1977, Leland & Pyle 1977). For these authors, debt has a positive effect on investment. In Benin, interest on debt is deductible in computing CIT and offers a CIT saving to managers of non-zero leverage firms (See Article 25 of Benin's General Tax Code). Thus, in the light of this review of related literature, the third hypothesis is formulated as follows:

*H3. "Debt affects positively investment behavior of corporate managers in Benin".*

### 2.2.4. Relationship between equity and investment

According to Dragota *et al.* (2009), if the tax burden on corporate gross incomes is increasing, the companies' management can follow two reasons in deciding the dividend payout: to allocate more for investments, or to increase the dividend ratio. Each of these decisions can be argued based on Corporate Finance principles, depending on the management objectives. In Benin, equity dividends are taxed twice, once at firm level for CIT purposes and once at shareholder level for personal income tax purposes (see Article 69 of Benin's General Tax Code). This dividend tax policy does not encourage corporate managers to invest in Benin. According to Iraqi (2019), several structural austerities pre-exist and become even stronger, diverting the will of foreign investors to come and exploit the different economic potentialities of the African continent, including Benin. According to Wen (2020: p. 3), tax rate cuts directly reduce the amount of tax payable by a profitable company, but also indirectly increase its taxable income, by eroding the value of capital allowances. However, for a profitable company that finances its investments from its own funds, the first effect dominates, so that lower tax rates encourage it to invest. However, tax rate cuts do not benefit loss-making companies, which are in large numbers during a recession. Thus, in the light of this review of related literature, the fourth hypothesis is formulated as follows:

*H4. "Equity affects negatively investment behavior of corporate managers in Benin".*

### 2.2.5. Relationship between past investment and current investment

Tax incentives have two types of effect on investment: transitory effects, resulting from the time lags in investment plans caused by temporary deductions, and long-term effects, resulting from the lowering of the cost of capital. According to Wen (2020: pp. 3-4), temporary tax rate cuts or temporary provisions

for immediate expensing can provide important investment incentives for companies, with an additional beneficial effect for those facing cash flow constraints. A notable difference between tax rate cuts and immediate write-offs is that the former increase after-tax profits from the capital stock that a company has built up through past investment. Immediate expensing, on the other hand, only targets new investment. Temporary reductions in tax rates can also have perverse effects, in that companies will feel less encouraged to invest as the incentive scheme nears its end. Thus, in the light of this review of related literature, the fifth hypothesis is formulated as follows:

*H5. "Past investment affects current investment behavior of corporate managers in Benin".*

## 3. Method and data

For any researcher wishing to carry out a rigorous study, the choice of an epistemological positioning becomes necessary, as the latter enables them to consolidate the validity and relevance of their research (Thiétart 2014, cited in Tibi *et al.* 2024: p. 9). Thus, to achieve the objective of this research, we have chosen an objectivist ontological and positivist epistemological posture, reflected in a predominant quantitative analysis approach with a hypothetico-deductive reasoning logic. The methodology covers study design, sampling and data, and modelling.

### 3.1. Study design

The main objective of this research was to analyze the influence of tax behavior on the investment behavior of corporate managers in Benin. Tax behavior has sociological, psychological and economic aspects. We chose the economic aspect. Thus, from an economic point of view, tax behavior is the attitude of making the most of the advantages contained in the tax code in order to achieve one of the following results:

- *Overpaying tax*: this is very rare because most corporate managers are averse to paying tax and look for loopholes in the tax system to optimize tax.
- *Paying the right amount of tax*: this case is somewhat rare because of the complexities involved in determining the right amount of tax to pay, given the wide range of tax advantages available, which must be exploited to the full.
- *Underpaying tax*: this is a regular occurrence because of the principle of the least-taxed route, established by Beninese law, under which firms can legally opt for the rules that will enable them to pay the least tax, and because corporate managers prefer tax savings to reduce tax-related costs.
- *Not paying tax*: this is a regular occurrence because firms tend to declare zero profit in order not to pay tax or to pay the minimum flat-rate tax provided for by tax law.
- *Obtaining a tax credit*: given that the tax code contains provisions relating to obtaining a tax credit, for example the tax deficit regime, some managers declare an accounting loss or deficit in order to benefit from the tax credit.

Benin's General Tax Code, like the tax codes of most countries around the world, contains provisions that encourage financial transactions to a greater or lesser extent, enabling corporate managers to meet their financial and tax obligations. This research is therefore more concerned with the economic effect of CIT behavior on the investment behavior of corporate managers in Benin.

### 3.2. Sampling and data

The target population is made up of large firms in the banking and micro-finance sector in Benin. Benin's banking system comprises a BCEAO National Agency, a National Credit Council, banks, financial institutions and a Professional Association of Banks and Financial Institutions (APBEF). From the point of view of Azokli and Adjibi (2007), the microfinance sector in Benin is driven by various actors, the

main ones being: savings and/or credit mutuals and cooperatives, direct credit institutions, microfinance projects and non-governmental organizations (NGOs). They all operate within a well-defined legal framework. The microfinance sector in Benin is made up of institutions known as Decentralized Financial Systems (DFS). The sample covered banks and DFSs. The sample is made up of joint stock companies that are subject to CIT. Thus, the sample selected is a cylindrical panel made up of twenty-one (21) firms, i.e. 11 banks over the period from 2011 to 2020 and 10 DFS over the period from 2016 to 2021. This makes a total of 170 (110 for the banks and 60 for the DFS) firm-year observations for computer processing of the data. However, computer processing of the data results in the loss of one year in first differences and two years in double differences, which adjusts the sample size to 149 (99 for banks and 50 for DFS) firm-year observations for the first difference and 128 (88 for banks and 40 for DFS) firm-year observations for the double difference.

We have collected financial statements that belong to or correspond only to the last twelve consecutive years (from 2010 to 2021). In addition to this, the data collected is reliable in that it is collected from the website https://www.bceao.int/ of the Central Bank of West African States (BCEAO). The data used was obtained mainly by downloading several files in PDF format. We imported the data from the downloaded PDF documents into the Excel 2021 spreadsheet, enabling us to extract the relevant information for our research from the secondary data sources. The data in Excel format was used to create a dynamic data panel that could be used with EViews 13 software.

### 3.3. Modelling

The dependent variable or variable to be explained is the investment behavior referred to as INVESTMENT. To explain INVESTMENT, four tax and non-tax explanatory variables from the theoretical and empirical literature are used; the non-tax variables included in the estimated models are adjusted for tax in order to highlight the impact of the latter. The explanatory variables are cash flow, denoted by CASH_FLOW, debts, denoted by DEBT, shareholders' equity, denoted by EQUITY, and the tax saving linked to the deduction of depreciation allowances on economic assets, denoted by EIDDAAE. In addition to these explanatory variables, the lagged endogenous variable or past investment, designated INVESTMENT(-1), is introduced into the model in order to take account of the cumulative effect of the investment decision and to express a dynamic model. For convenience, the variables selected are subdivided by the same variable, in order to harmonize the values.

Gross investment is equal to the change in net tangible assets plus the depreciation charge for the year. The change in tangible assets represents acquisitions offset by disposals. The dependent variable $INVESTMENT_{i,t}$ denotes capital expenditure by firm i in current year t divided by total gross investment in tangible fixed assets by firm i in year t. Table 1 presents the variables relating to the investment model, giving the definition of each one, the expected sign and the theories or authors who have used them in their models.

**Table 1:** Variables in the model testing CIT effect behavior on investment behavior

***Variable to Explain: INVESTMENT*** $= \frac{\textit{Gross Investment in Tangible Fixed Assets}}{\textit{Total Gross Tangible Fixed Assets}}$

| *Explanatory Variable* | *Definition* | *Expected Sign* | *Theory/Author* |
|---|---|---|---|
| **EIDDAAE** | $\frac{\textit{Legal tax rate} \times \textit{Dotations}^2}{\textit{Economic assets}}$ | ***Positive*** | TOT, Graham and Harvey (2001). |

[2] Depreciation, amortization and provisions for impairment in value of gross tangible fixed assets.

| | | | |
|---|---|---|---|
| **CASH_FLOW** | $\frac{Net\ Income + Dotations - Dividend}{Total\ Gross\ Tangible\ Fixed\ Assets}$ | ***Positive*** | FCF. |
| **DEBT** | $\frac{Total\ financial\ debt}{Total\ Gross\ Tangible\ Fixed\ Assets}$ | ***Positive*** | Modigliani and Miller (1963), FCF, TOT. |
| **EQUITY** | $\frac{Shareholders'\ equity}{Total\ Gross\ Tangible\ Fixed\ Assets}$ | ***Negative*** | POT, FCF. |
| **INVESTMENT(-1)** | **Past Investment** | +/- | |

**Source:** Author based on literature review (2024).

The general form of the investment behavior model (in tangible assets) is as follows:

$$\mathbf{INVESTMENT} = \mathbf{f}(\mathbf{Depreciation}, \mathbf{Cash\ Flow}, \mathbf{Debt}, \mathbf{Equity}, \mathbf{Past\ Investment}) \quad (1)$$

However, the specific form of the investment behavior model is expressed as follows:

$$(\mathbf{INVESTMENT})_{i,t} = \alpha_0 + \alpha_1(\mathbf{EIDDAAE})_{i,t-1} + \alpha_2 \mathbf{CASH_{FLOW}}_{i,t} + \alpha_3 \mathbf{DEBT}_{i,t} + \alpha_4 \mathbf{EQUITY}_{i,t} + \alpha_5 \mathbf{INVESTMENT}_{i,t-1} + \varepsilon_{it} \quad (2)$$

Where:

Standard Coefficients, Indices and Error Term

- $\alpha_0$ = Origin coefficient.
- $\alpha_1$ = Savings on depreciation coefficient.
- $\alpha_2$ = Cash-flow coefficient.
- $\alpha_3$ = Debt coefficient.
- $\alpha_4$ = Equity coefficient.
- $\alpha_5$ = Past investment coefficient.
- **i** = Index for firm i, with $\mathbf{i} \in [1 ; 21]$
- **t** = Index of time t, with $t \in [2011 ; 2021]$
- $\varepsilon$ = Error term.

Dependent Variable

$(\mathbf{INVESTMENT})_{i,t}$ represents the ratio of gross investment in tangible fixed assets to total gross investment in tangible fixed assets of firm i in year t.

Independent Variables

- **EIDDAAE**$_{i,t}$ is the ratio of the tax saving arising from the deduction of depreciation allowances on fixed assets to the economic assets of firm i in year t.
- **CASH_FLOW**$_{i,t}$ is the ratio of cash flow to total gross investment in tangible fixed assets of firm i in year t.
- **DEBT**$_{i,t}$ is the ratio of financial debt to total gross investment in tangible fixed assets of firm i in year t.
- **EQUITY**$_{i,t}$ is the ratio of equity to total gross investment in tangible fixed assets of firm i in year t.
- **INVESTMENT**$_{i,t-1}$ is the ratio of gross investment in tangible fixed assets to total gross investment in tangible fixed assets of firm i in year t-1.

With this in mind, the Generalized Method of Moments in First Difference (" GMMFD ") estimator was used to estimate this behavioral model of investment by corporate managers in Benin.

## 4. Test results & analysis with implications

The presentation of the results of the investment model is divided into two paragraphs. Paragraph 1 presents the results of the statistical tests and analyses of the investment model. Paragraph 2 shows the estimation results of the investment model and the interpretations.

### 4.1. Test results and statistical analysis of investment model

Tests and statistical analyses of the investment model are developed.

#### 4.1.1. Results of statistical tests of investment model

Statistical tests include stationarity, Sargan-Hansen, Arellano-Bond and Wald tests.

##### 4.1.1.1. Stationarity tests for variables in investment model

Unit root tests are used to determine whether a time series variable is stationary or non-stationary. Stationary time series have a constant mean and variance over time, while non-stationary time series have trends or fluctuations. The aim of this section is to test the panel stationarity of the explained and explanatory variables of the investment model. If the variables are stationary, we can be sure of the reliability of the regression results. The stationarity test avoids the risk of spurious regressions between endogenous and exogenous variables. The stationarity (unit root) tests of Levin *et al.* (2002), Breitung (2001), Im *et al.* (2003), ADF, PP and Hadri (2000) were applied to all the variables in the investment model. The hypotheses of the tests are:

*H0: Presence of unit root/non-stationary series (Prob > 5%)*

*H1: Absence of unit root/Series stationary (Prob < 5%).*

All these tests reveal that the five variables CASH_FLOW, DEBT, EIDDAAE, EQUITY and INVESTMENT are stationary at level at the 1% threshold for Levin-Lin-Chu and Hadri; three variables out of five, CASH_FLOW, EQUITY and INVESTMENT, are stationary at level for PP, and the two others, DEBT and EIDDAAE, are stationary in first difference for PP ; for ADF and Im-Pesaran-Shin, the INVESTMENT variable is stationary at level and the other four variables CASH_FLOW, DEBT, EQUITY and EIDDAAE are stationary in first difference; for Breitung, the INVESTMENT variable is stationary at level, the DEBT variable is stationary in first difference and the other three variables CASH_FLOW, EIDDAAE and EQUITY are stationary in second difference. Table 2 summarizes the results of the stationarity tests for the variables used in the investment model.

**Table 2:** Summary of stationarity tests for investment model variables

| Synthesis of stationarity or unit root tests of investment model variables *(Levin-Lin-Chu, Breitung, Im-Pesaran-Shin, ADF, PP, Hadri tests )* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Levin Lin Chu** | **Breitung** | | | **Im Pesaran Shin** | | **ADF** | | **PP** | | **Hadri** | **Results** |
| | ***Level*** | ***Level*** | ***First*** | ***Second*** | ***Level*** | ***First*** | ***Level*** | ***First*** | ***Level*** | ***First*** | ***Level*** | |
| **CASH_FLOW** | **(0.0000)*** ** | **(0.9946)** | **(0.9870)** | **(0.0000)*** ** | **(0.6649)** | **(0.0345)** ** | **(0.3512)** | **(0.0135)** ** | **(0.0088)*** ** | | **(0.0000)*** ** | **Stationary** |
| **DEBT** | **(0.0001)*** ** | **(0.9999)** | **(0.0282)** ** | | **(0.8803)** | **(0.0070)*** ** | **(0.9467)** | **(0.0006)*** ** | **(0.1657)** | **(0.0000)*** ** | **(0.0000)*** ** | **Stationary** |
| **EIDDAAE** | **(0.0000)*** ** | **(0.9979)** | **(0.9865)** | **(0.0356)** ** | **(0.4349)** | **(0.0584)*** | **(0.2920)** | **(0.0010)*** ** | **(0.3747)** | **(0.0000)*** ** | **(0.0000)*** ** | **Stationary** |
| **EQUITY** | **(0.0000)*** ** | **(0.9999)** | **(0.9907)** | **(0.0000)*** ** | **(0.5789)** | **(0.0000)*** ** | **(0.1253)** | **(0.0000)*** ** | **( 0.0307)** ** | | **(0.0000)*** ** | **Stationary** |
| **INVESTMEN** | **(0.0000)*** ** | **(0.0670)*** | | | **(0.0000)*** ** | | **(0.0000)*** ** | | **(0.0000)*** ** | | **(0.0000)*** ** | **Stationary** |

**Source:** Author based on results of stationarity tests on EViews 13.

Note: If the p-values (the values in brackets) are less than 0.01(***); 0.05(**); 0.10(*); this means that the variables are stationary at the 1%; 5%; 10% threshold respectively. Given that results on the stationarity of variables sometimes diverge depending on the method applied (Levin-Lin-Chu, Breitung,

Im-Pesaran-Shin, ADF, PP, Hadri), a variable is stationary only when at least four out of the six tests indicate that the variable does not have a unit root.

#### 4.1.1.2. Sargan-Hansen test of investment model

The Sargan-Hansen test, also known as the Sargan test, is a statistical test used to assess the validity of over-identification restrictions in a statistical model. It was introduced by John Denis Sargan in 1958 and has several variants derived by him in 1975. The test is commonly used in the context of instrumental variable estimation and Generalized Method of Moments (GMM) estimation. The Sargan test or Sargan-Hansen test is also known as the Hansen test or J-test. The Sargan test is built on the null hypothesis (*H0*) that the error term should not be correlated with the set of exogenous variables if the instruments are valid. There are three conditions for applying the Sargan test. Firstly, the p-value must be greater than 5%. Secondly, the p-value must not be less than 10%. Thirdly, the p-value must be greater than 0.25 (Roodman 2006). The results of Sargan's post estimation test are summarized in Table 3 from the Appendix.

**Table 3:** Summary of results of the Sargan-Hansen test of investment model

| ***INVESTMENT Equation*** | | |
|---|---|---|
| | J-statistic | Prob |
| Test de Sargan | 18.75164 | 0.281752 |

**Source:** Author based on the results of various regressions

For the endogenous variable, INVESTMENT, the p-value of the Sargan test for the validity of the instruments is greater than 5%. Hypothesis *H0* is therefore accepted: the instruments are valid and exogenously linked to the error term; they therefore satisfy the orthogonal conditions.

#### 4.1.1.3. Arellano-Bond test of investment model

The Arellano-Bond test is a statistical method used in econometrics to deal with autocorrelation in panel data models. It is named after Manuel Arellano and Stephen Bond, who proposed the method in 1991 on the basis of earlier work by Alok Bhargava and John Denis Sargan in 1983. Panel data refers to data that includes observations on several entities (such as companies or individuals) over time. Autocorrelation, also known as serial correlation, occurs when the error terms in a regression model are correlated over several periods. The Arellano-Bond estimator is a Generalized Method of Moments (GMM) estimator specifically designed to estimate dynamic panel data models. The Arellano-Bond test is used to check for autocorrelation in the error terms of a dynamic panel data model. This is particularly important when lagged variables are used as instruments in the model. The test determines whether there is any dependence between the current error term and the lagged error terms, which may affect the validity of the results. If the test statistic is above the critical value, this suggests the presence of autocorrelation in the model. On the other hand, if the test statistic is below the critical value, this indicates no significant autocorrelation. The results of the post-estimation Arellano-Bond test are summarized in Table 4 from the appendix.

**Table 4:** Summary of results for the Arellano-Bond test of investment model

| ***INVESTMENT model*** | | |
|---|---|---|
| Test order | m-Statistic | Prob. |
| AR(1) | -4.331592 | 0.0000 |

**Source:** Author based on the results of various regressions

For investment model, the p-value of the Arellano-Bond serial correlation test is less than 5%. Consequently, the hypothesis of no autocorrelation in the residuals cannot be rejected.

#### 4.1.1.4. Wald test of investment model

The Wald test is a statistical test used to assess the significance of estimated parameters in a statistical model. The test compares the estimated value of the parameter with a hypothetical value, often zero, and determines whether there is a significant difference between them. Interpreting the results of the Wald test involves determining whether the estimated value of the parameter is significantly different from the hypothetical value. If the p-value associated with the test statistic is below the chosen significance level, this suggests that the parameter estimate significantly improves the fit of the model, and there is evidence that the variable has an effect. The results of the post estimation Wald test are summarized in table 5 in the appendix.

**Table 5:** Summary of Wald test results for investment model

| ***INVESTMENT model*** | | |
|---|---|---|
| | Value | Prob. |
| t-statistic | -10.22078 | 0.0000 |
| F-statistic | 104.4643 | 0.0000 |

**Source:** Author based on the results of various regressions

For investment model, the p-value of the Wald test of overall significance is less than 5%. Consequently, the estimated investment model is globally significant at the 1% level.

### 4.1.2. Results of descriptive analysis of investment model

This analysis focused on descriptive statistics, graphs of variables and regression residuals, correlations and the normality of errors (Jarque-Bera test).

#### 4.1.2.1. Descriptive statistics for investment model variables

Table 6 summarizes the descriptive statistics for the variables in the investment model, showing the mean, maximum, minimum and standard deviation. According to this table, the average rate for current investment is 5.70% compared to 11.26% for past investment.

**Table 6:** Descriptive statistics for investment model variables

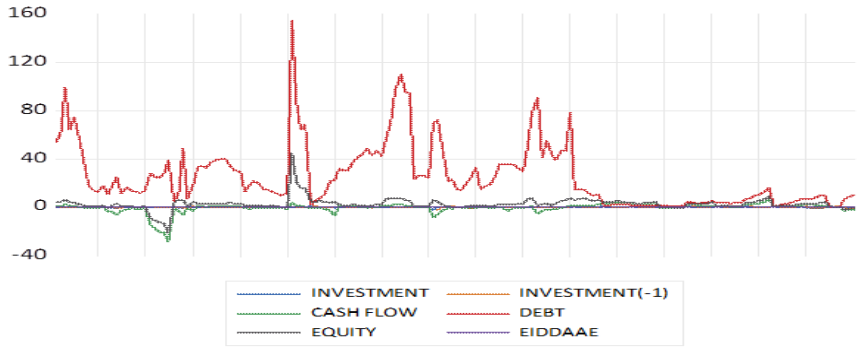
| | **INVESTMENT** | **EIDDAAE** | **CASH_FLOW** | **DEBT** | **EQUITY** | **INVESTMENT(-1)** |
|---|---|---|---|---|---|---|
| **Mean** | 0.057030 | -0.000850 | -0.430048 | 25.35383 | 2.653471 | 0.112608 |
| **Maximum** | 0.902661 | 0.013293 | 6.300403 | 110.0151 | 21.16279 | 1.000000 |
| **Minimum** | -1.405349 | -0.043071 | -28.83555 | 0.125886 | -20.92247 | -1.998294 |
| **Std. Dev.** | 0.236387 | 0.004532 | 4.162286 | 24.56020 | 4.149880 | 0.375954 |
| **Obs.** | 149 | 149 | 149 | 149 | 149 | 149 |

**Source:** Author based on results of descriptive statistics on EViews 13.

#### 4.1.2.2. Graphical analysis of investment model variables and regression residuals

Graph 1 shows the graphs of the variables in investment model.

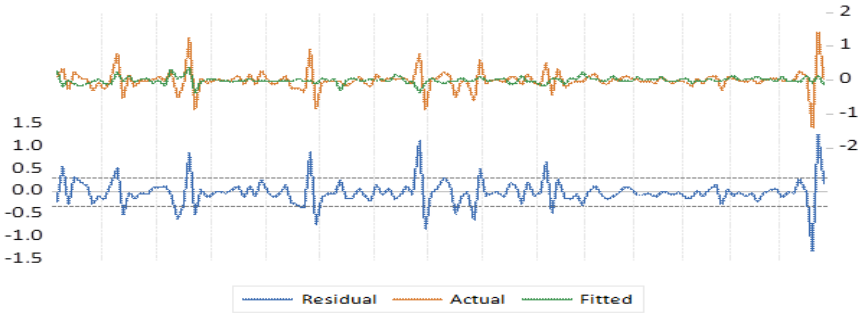
**Graph 1:** Graphs of investment model variables




**Source:** Author based on results of descriptive statistics on EViews 13.

Graph 2 shows the plots of the observed endogenous variable (*Actual*), the estimated endogenous variable (*Fitted*) and the residuals from the regression of investment model.

**Graph 2:** Graphs of the endogenous variable and the residuals from the regression of investment model




Source: Author based on results of descriptive statistics on EViews 13.

***Residual***: The plot of the residuals from the $\varepsilon i$ regression. ***Actual***: The plot of the observed endogenous variable (Y). ***Fitted***: The plot of the estimated endogenous variable (**Y**).

### 4.1.2.3. Analysis of correlations between variables in investment model

Preliminary analysis of the correlation matrices between the variables used in the investment model, together with a Spearman rank order test, showed that some variables were more or less strongly correlated. The application of linear regressions on the variables used made it possible to limit the variables with a very high correlation between them by means of the multicollinearity detection statistic. Table 7 presents the Spearman rank order correlations between the variables of the investment model of business managers in Benin. According to Table 7, in the framework of the investment model, a strong correlation is found between the variables CASH_FLOW and EIDDAAE, and a medium correlation is found between the variables CASH_FLOW and EQUITY, then between DEBT and EIDDAAE.

**Table 7:** Spearman rank-order correlations for variables in investment model

| | INVESTMENT | INVESTMENT(-1) | CASH_FLOW | DEBT | EQUITY | EIDDAAE |
|---|---|---|---|---|---|---|
| **INVESTMENT** | 1.000000 | | | | | |
| **INVESTMENT(-1)** | 0.231876 | 1.000000 | | | | |
| **CASH_FLOW** | -0.053176 | 0.044655 | 1.000000 | | | |
| **DEBT** | 0.031482 | -0.113345 | -0.192068 | 1.000000 | | |

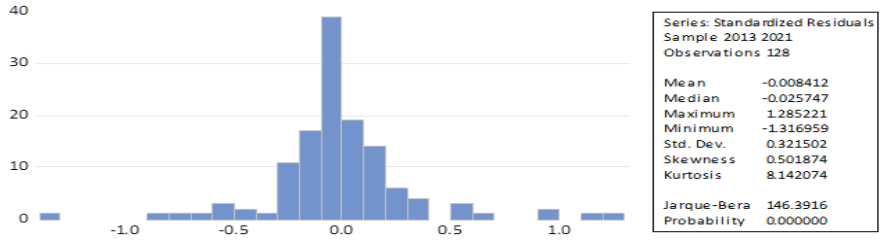
| | | | | | | |
|---|---|---|---|---|---|---|
| **EQUITY** | -0.183835 | -0.136209 | 0.575998 | 0.246663 | 1.000000 | |
| **EIDDAAE** | 0.061119 | 0.100605 | 0.621254 | -0.473815 | 0.203908 | 1.000000 |

**Source:** Author based on results of descriptive statistics on EViews 13.

#### 4.1.2.4. Normality analysis of investment model errors

Graph 3 shows the histogram and the normality test of investment model errors.

**Graph 3:** Normality analysis of investment model errors




**Source:** Author based on results of descriptive statistics on EViews 13.

The probability associated with the Jarque-Bera statistic (0.00) is less than 0.05. The assumption of normality of the residuals is therefore not verified. We can therefore conclude that the residuals from the estimation of investment model are not stationary. The normality of their distribution is invalidated.

### 4.2. Investment model estimation results and interpretations

This paragraph presents the results of the estimation of the investment model and the econometric and economic interpretations of investment model. The detailed results of the EViews 13 regressions are presented in the appendix.

#### 4.2.1. Estimation of Investment model

The factors involved in explaining the investment of corporate managers in Benin are essentially internal to our model. The results of the estimation of the determinants of the endogenous variable INVESTMENT are summarized in Table 8.

**Table 8:** Summary of the estimation of INVESTMENT

$$\boldsymbol{INVESTMENT = f(EIDDAAE, CASH\_FLOW, DEBT, EQUITY, INVESTMENT(-1))}$$

| Variable | Coefficient | Prob. |
|---|---|---|
| **EIDDAAE** | 9.239630 | 0.0050*** |
| **CASH_FLOW** | 0.068798 | 0.0000*** |
| **DEBT** | 0.006687 | 0.0000*** |
| **EQUITY** | -0.041100 | 0.0000*** |
| **INVESTMENT (-1)** | -0.112068 | 0.0000*** |

Note: (***), (**) and (*) denote variables significant at 1%, 5% and 10% respectively.

**Source:** Author, based on the results of various regressions.

The characteristic equation of the endogenous variable INVESTMENT estimated by the generalized method of moments in difference (GMMD) is:

**@DADJ(INVESTMENT) = C(1)*@DADJ(CASH_FLOW) + C(2)*@DADJ(DEBT) + C(3)*@DADJ(EQUITY) + C(4)*@DADJ(EIDDAAE) + C(5)*@DADJ(INVESTMENT(-1))**

By substituting the coefficients, this equation becomes:

**@DADJ(INVESTMENT) = + 0.0687979653188*@DADJ(CASH_FLOW) + 0.00668702508175*@DADJ(DEBT) - 0.0410999617823*@DADJ(EQUITY) + 9.23962987275*@DADJ(EIDDAAE) - 0.112067788797*@DADJ(INVESTMENT(-1)).**

#### 4.2.2. Interpretations of Investment Model

Investment model can be interpreted from an econometric or economic point of view.

##### 4.2.2.1. Econometric interpretation

After conducting several trials to select the instrumental variables to be used, while complying with the Sargan test of instrument validity and the hypothesis of no auto-correlation between residuals of order 1, we retained the exogenous variables as instrumental variables. The results used are those of estimation with robust statistical tests. The Wald test of overall significance was not rejected and the hypothesis of no auto-correlation between the residuals of the 1st order was also verified. In other words, the variables selected really explain the investment (INVESTMENT). As for the individual significance of the parameters, the test decision will be made by comparing the p-value (Prob>z) and the different α thresholds (1% or 5% or 10%). If the p-value is less than the test threshold, then we cannot reject the hypothesis that the coefficient subject to the test is significantly different from zero. Table 8 shows that the five explanatory variables INVESTMENT (-1), CASH_FLOW, DEBT, EQUITY and EIDDAAE are all significant at the 1% level.

##### 4.2.2.2. Economic interpretation

In the estimated investment model, the explanatory variables are tax savings due to the deduction of depreciation allowances for tangible fixed assets from economic assets (EIDDAAE), cash flow (CASH_FLOW), financial debts (DEBT), shareholders' equity (EQUITY) and past investment (INVESTMENT(-1)). The results of the estimations indicate that the most attractive factors in the investment behavior of corporate managers in tangible fixed assets in Benin are EIDDAAE, CASH_FLOW and DEBT, while the most repellent factors in their investment behavior are EQUITY and INVESTMENT(1).

The first explanatory variable is the tax saving due to the deduction of fixed asset depreciation allowances from economic assets (EIDDAAE). Its associated coefficient has a positive sign and is significant in the long term at the 1% threshold. The positive impact of EIDDAAE is greater in the long term. In fact, an increase in EIDDAAE of 1% stimulates gross investment in tangible fixed assets by 9.239630% in the long term. These results can be explained by the investment behavior of corporate managers in Benin, based on their optimization of the tax shield due to the deduction of depreciation on tangible fixed assets in computing CIT.

With regard to the explanatory variable, CASH_FLOW, the estimates show that it increases gross investment in tangible fixed assets, since the associated coefficient is positive and significant in the long term at the 1% threshold. This sign is consistent with the theory of free cash flow (FCF). A 100% increase in CASH_FLOW leads to a 6.8798% increase in gross investment in long-term tangible fixed assets. The CASH_FLOW has a positive effect on investment because of the tax shield for fixed assets in computing CIT.

The DEBT variable, representing corporate financial debt, has a positive and significant effect on gross investment in long-term tangible fixed assets at the 1% threshold. This sign is consistent with theory. In fact, financial debts provide a tax shield because of the deduction of debt interest in computing CIT. They therefore help to make business investment more stable. The results show that when the DEBT variable increases by 100%, *ceteris paribus*, gross investment in tangible fixed assets increases by 0.6687%. This is why corporate managers in Benin display investment and debt behavior aligned with their CIT behavior.

On the other hand, the explanatory variable relating to equity (EQUITY) has an associated coefficient that displays a negative sign and is significant in the long term at the 1% threshold. This sign is consistent with theory. In fact, equity offers a capital loss of CIT because of the taxation of equity dividends in computing CIT. The results show that when the variable EQUITY increases by 100%, *ceteris paribus*, gross investment in tangible fixed assets decreases by 4.1100%. There is a crowding out effect between shareholding behavior and gross tangible investment behavior due to CIT's behavior in Benin.

The last explanatory variable is the lagged dependent variable or firms' past investment (INVESTMENT(-1)). The coefficient associated with past investment is negative and significant at the 1% level in the long term. Indeed, when past investment increases by 10%, *ceteris paribus*, current investment decreases by 1.12068%. This result shows that current gross investment in tangible fixed assets is held back by past gross investment in tangible fixed assets, probably because of the unfavorable treatment of CIT investments in Benin. Indeed, this confirms the stylizing fact that business managers in Benin generally complain about the pressure and non-neutrality of CIT in their tangible fixed asset investment behavior.

In total, all hypotheses H1, H2, H3, H4 and H5 are verified.

### 4.3. Policy implications of the findings

The tax policy suggestions arising from the estimation results of investment model are as follows:

- Breaking with all fixed asset depreciation and provision regimes, in order to ensure tax neutrality between tangible, intangible and financial fixed assets. In this way, corporate managers will no longer be tempted to invest in order to make savings on CIT, due to the deduction of depreciation allowances on fixed assets.

- Break with all interest and financial expense regimes, in order to ensure tax neutrality between equity capital and financial debts. In this way, corporate managers will no longer be tempted to invest in order to save CIT due to the deduction of interest on debt.

- Break with all systems of exemption for profits set aside, in order to ensure tax neutrality between profits set aside and profits distributed in the form of cash. In this way, corporate managers will no longer be tempted to invest in order to exempt retained earnings.

- Substitute the system of corporate capital taxation (CCT) for the system of corporate income taxation (CIT), in order to prevent CIT optimization, the consequences of which are tax corruption, tax evasion, tax avoidance, base erosion and profit shifting (BEPS), to name but five tax consequences.

- Promote tax neutrality in terms of corporate taxation (CT) in the ordinary tax system and in basic preferential regimes and special regimes under Benin's Investment Code.

## 5. Conclusion

The results did show that tax behavior affects the investment behavior of corporate managers, positively through variables constituting a CIT saving or likely to offer a CIT saving, and negatively through variables generating a CIT capital loss. Company managers are therefore more inclined to align their investment behavior with their CIT behavior because of CIT savings, which distorts the rules of financial decision-making. However, any CIT saving, whether it relates to depreciable fixed assets, debt, bad debts or any other item in the corporate accounts, is in reality nothing more than an unpremeditated diversion of income in favor of the firm eligible for the CIT saving to the detriment of the firm not eligible for the CIT saving, the two firms being identical and belonging to the same class of financial and commercial risk. The effect of the CIT saving is finally cancelled out at the level of the State which granted this saving through the tax code. It is up to the State to carry out a tax reform aimed at eliminating all CIT biases and ensuring the neutrality of CIT. Pending the advent of such a tax justice reform, the issue of the influence of tax behavior on the financing behavior of corporate managers arises. The answer to this research question will be the subject of a later paper.

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