COMPARATIVE STUDY OF OHLSON AND CASH FLOW DISCOUNTING MODELS IN THE PREDICTION OF THE STOCK PRICE

Faten Nasfi Salem [*]

* URRED, Higher Institute of Management, Gabes, Tunisia
Contact details: URRED, Higher Institute of Management, Jilani Habib Street 6002, Gabes, Tunisia

OPEN ACCESS

Abstract

Two models derived from the dividend discount model attracted the attention of researchers: the residual income model (RIM) and the Ohlson model. These models are said to be dualistic since they combine both aspects of the economic and accounting vision. We propose, in our study, to test the performance of the dualistic evaluation model and to show the importance of accounting information. To do this, we will calculate the value of a listed company according to the actuarial valuation model, namely: the available cash flow discounting model (DCF) and the Ohlson model as a dualistic model. Then, we will determine, based on the expectation and the variance of the signed prediction error (SPE), the model that comes closest to the market price in the case of a Tunisian listed company. The results found in the Tunisian context show the superiority of the Ohlson model in the prediction of stock market prices. This model underlies the traditional belief that the company value is compounded of two main parts: the net value of the investment made in it (book value) and the present value of the period benefits (earnings) that together bring the "clean surplus" concept of the shareholders' equity value. Specifically, Ohlson (1995) motivates the adoption of the historical price model in value relevance studies, which expresses value as a function of earnings and book values.

Keywords: Value, Ohlson Model, Available Cash Flow Discount Model, Performance, Share Price Forecast

Authors' individual contribution: The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

Declaration of conflicting interests: The Author declares that there is no conflict of interest.

1. INTRODUCTION

The evaluation of assets in general and businesses, in particular, is an extremely important task for making financial decisions. Determining the value of the company in the financial market is of paramount importance to investors since it is according to the value of the perception of the company that depends on their investment decisions. This need to know the value of the company on the financial market has given birth to a practice called "fundamental analysis".

The practice of fundamental analysis refers to the methods developed by financial analysts to determine the key performance elements, the weak points, and the competitive strengths of the company and to estimate its value.

Analysts release "fundamental" indicators following the analysis of the financial statements. These indicators make it possible to estimate future

results, cash flows, dividends, and the company's ability to generate surplus results.

The literature reveals several evaluation methods. The most common ones are the discounted cash flow, the method of Goodwill comparative approach, and dualistic model, such as the Ohlson model. Paradoxically, these methods often lead to different values. Thus, the question of superiority and complementarily between the different methods of evaluation to become increasingly relevant arises. We propose, in our study, to test the performance of the dualistic evaluation model. To do this, we will calculate the value of a listed company according to the actuarial valuation models, namely: the updated discounted cash flow (DCF) model and the Ohlson model as a dualistic model. Then we will determine, based on the expectation and the variance of the signed prediction error (SPE), the model that comes closest to the market price in the case of listed Tunisian companies.

The structure of the paper is as follows. Section 2 reviews the relevant literature. Section 3 develops the research hypothesis, on the other hand, Section 4 analyzes the methodology that was used to conduct empirical research on the relevance of Ohlson's model in the prediction of the stock price and, finally, the results are discussed in a fifth section.

2. LITERATURE REVIEW

2.1. Theoretical approach of value

The financial theory defines the value of any asset in finance as the discounted sum of the revenue streams that asset is likely to generate in the future.

From an evaluation perspective, Pène (1993) states that the enterprise is at once a good like any other that can be obtained, at least for listed companies, on a particular market, the stock market, and an extremely good commodity. The complex which is characterized, among other things, by the fact that it can have several values at the same time.

As a result, it is difficult to determine the real value of the business as a whole, which is why business valuation usually comes down to stock valuation.

Under the assumptions of capital market perfection, investor rationality, and the absence of uncertainty, the valuation of all shares is governed by the following fundamental principle: the price of a share must be such that the rate of profitability of all actions will be the same over a given period of time (Durand, 1957; Miller & Modigliani, 1961; Gilbert & Yalenios, 2017).

Miller and Modigliani (1961) show that from the fundamental valuation principle, four other valuation methods can be formulated based on what investors "actually" capitalize when they buy a stock.

At this level, there are four points of view: the discounted cash flow approach, the investment opportunity approach, investors capitalize a "goodwill", i.e., the goodwill that is added to the current value of the company's earnings, investors directly capitalize on the dividend flow generated by holding a share.

2.2. The positive theory

Changes in the profitability of assets on the financial market and the analysis of the link between the accounting figures are part of the positive accounting theory.

It is Jensen and Meckling (1976) who is the first to speak of "positive" accounting theory "why accounting is what it is, why accountants do what they do, and what effects these have on the use of resources?" at the current level of research related to the informational content of accounting figures.

Tremblay, Cormier, and Magnan (1993) state that information content is divided into two approaches:

1. The differential or informational approach (also called event or yield studies), initiated by Ball and Brown (1968), stipulates that accounting information is considered useful by investors if it is able to produce a stock market return abnormal at the time of publication.

2. The valuation approach (price studies) seeks to show whether the information contained in the financial statements can explain the price of a security at a given moment; in this case, we can conclude that investors use this information to evaluate this security. It is within this framework that our research is integrated.

From Miller and Modigliani's model (1961), most research has tested the nature of the relationship between the share price and the result generated by the business. In fact, this is only from the work done by Ohlson (1995) and Feltham and Ohlson (1999) that the valuation approach has been of great interest.

2.3. Agency theory and behavior of stock market returns

Jensen and Meckling (1976) see the firm as a meeting place for contracts between different parties. The behavior of the firm is then guided by the contractual relations that define it and by the property rights contained in these different contracts.

Paquet (1996) states that "since the market value of the enterprise is the sum of the value of the shares and the value of the debt, the managers can increase the wealth of the shareholders by increasing the value of the enterprise or by realizing a transfer of value to the detriment of the creditors and in favor of the owners.

It is in this last case that the conflict arises. According to the agency's theory, the conflicting nature of the relationship between shareholders and executives or managers and creditors can only encourage companies to adopt rigorous management tending to maximize the value of the company. To maximize the value of the business, leaders often have an interest in choosing the riskiest projects. As a result, the risk of non-payment of debts increases. According to Jensen and Meckling (1976), investors' anticipated flows are strongly influenced by the extent of agency problems. When conflicts of interest are important, the costs would be high and agency expectations market players are down. This ratio results in a market to book (MTB) less than unity. And when governance mechanisms put in place are adequate and effective, expectations of

market players are on the rise. Thus, the difference between the market value and asset value would be favorable and the MTB ratio is greater than unity.

2.4. The fundamental analysis

Lev and Thiagarajan (1993), Clout, Falta, and Willett (2015) note that fundamental analysis aims to determine the value of a stock market by carefully examining key information such as earnings, risk, growth and competitive position. The approach of the fundamental analysis is very different, on the one hand, it is based on the idea that each title has an intrinsic value, that sooner or later, the market will eventually recognize; On the other hand, it consists in using all the available information on the physical and financial qualities of companies, as well as their development prospects.

The value of the company is the value of its economic assets that can be calculated by crossing two approaches (direct and indirect). The direct approach begins with the determination of the value of the economic asset, from which, the value of equity is then deducted. The indirect approach is based on different methods of separately valuing the company's liabilities, equity, and net debt, and is then summed to obtain economic value.

These two approaches are associated with different evaluation methods. These have the same theoretical basis and the same logic as for the valuation of financial assets and can be grouped into three broad categories:

1. *The asset-based approach:* it is based on what the company owns and consists in carrying out the algebraic sum of the market values or the replacement of the different assets and commitments of the company.

2. *The "dynamic" approach:* it is based on what the company will report, it evaluates the assets at the present value of future flows of income they provide.

3. *The analogue approach:* it takes into account the price (or more exactly the return) of comparable assets paid by well-informed operators in organized markets. It is based on the capitalization of various profitability parameters of the company and makes it possible to situate the value of a company compared to others.

From this, we can identify the dividend discounting method (DDM) and the discounted cash flow method (DCF).

Recently, two models derived from the dividend discount model have attracted the attention of researchers: the residual income model (RIM) and the Ohlson model. These models combine both aspects of the economic and accounting vision.

2.5. The discounted cash flow model (DCF)

The cash flow method, also referred to as DCF, is widely accepted in asset valuation and translates financially that an asset "is worth what it pays". In general terms, the value of the business is calculated as follows:

$$V = \sum_{j=1}^{\infty} \frac{E(CF_t)}{(1+k)^t} \qquad (1)$$

This method presents several difficulties: one in the calculation of the cash flow, another in the estimation of the discount rate, and another in the estimate of the terminal value.

2.6. Ohlson model

Ohlson's model is similar to the residual profitability model developed by Edwards and Bell (1961), which is a dualistic model whose enterprise value is equal to the discounted sum of residual profits from future activities, with:

$$V_t = CP_t + \sum_{i=1}^{\infty} \frac{E_t(E_{t+i}^a)}{(1+K_e)^i} \qquad (2)$$

where,
V_t: the intrinsic value of the enterprise according to the valuation model by the residual profit;
CP_t: book value of the company;
E_{t+i}^a: abnormal or residual income;
K_e: cost of equity.

Bernard (1995) in his study showed that over a finite horizon T the value of the firm according to the Ohlson model is calculated as follows:

$$V_0 = CP_0 + \sum_{t=1}^{T} \frac{(ROE_t - K_e)CP_{t-1}}{(1+K_e)^t} \qquad (3)$$

where,
V_0: the value of the title i according to the Ohlson model in year 0 which varies between the years of the estimation;
K_e: cost of equity;
CP_0: the value of equity in year 0 = equity;
ROE_t: return on equity = income/value of equity in year t.
T: the estimated horizon of two years;
$(ROE_t - K_e)CP_{t-1}$: abnormal earning realized during the year t.

3. HYPOTHESIS DEVELOPMENT

In their study, Courteau, Kao, and Richardson (2000), Barth, Clinch, and Israeli (2016) found that the residual income valuation model (RIVM) performs better than the other two models (DDM and DCF).

Tham (2001), Courteau, Kao, and Richardson (2013), by comparing the intrinsic value calculated according to the DDM model and the RIM, concludes that by complying with the Modigliani and Miller's conditions, the models provide the same value.

Lee (1999), Li and Mohanran (2014), Senthilnathan (2013), Silvestri and Veltri (2012) have tried to see whether the traditional indexes and the base indexes of the Ohlson model can predict equity income, they found that traditional indices have low predictability of the outcome while the basic indexes of the Ohlson models are more efficient.

Courteau et al. (2000) compare the dividend discount models, the cash flow discount model, and the residual profit model. To do this, they use two measures, namely, the prediction error SPE and the absolute value of the error "absolute prediction error" (APE).

The results found allow us to conclude that the equivalence or the superiority of the model depends on the conditions allowing to calculate the intrinsic value.

Courteau et al. (2000), Saha and Bose (2017) found that the RIM performs better when forecasts are not available. As a result of this literature review, it has been noted that the majority of research assimilates the Ohlson model to the RIM and studies its relevance by comparing it to other models: DDM and DCF.

Thus, we can formulate our hypothesis:

H1: The Ohlson model is more performing than the free cash flow model in quoted price forecasting.

4. METHODOLOGY

4.1. Strategy of verification

The objective of this work is to determine the performance of the Ohlson model compared to the actuarial model in the prediction of stock market prices in the Tunisian context. The study is spread over a period of four years from 2012 to 2015. Indeed, the number of companies varies from year to year.

4.2. The models used

In order to achieve our objective and verify our hypothesis, which consists in comparing the performance of the DCF and the Ohlson model, we will adopt the same methodology as Penman and Sougiannis (1998), Francis (2000), Tham (2001), and Courteau et al. (2000), which consists in calculating the intrinsic value of the share successively according to the available cash flow discounting model, and the Ohlson model (1995) for our sample, and throughout the study period using the flowing equations.

The estimation horizon is set at two years.

The calculation of the forecast error is done by applying this equation:

$$SPE = \frac{(IV_{it} - P_{it})}{P_{it}} \quad (4)$$

The mean and the variance of this error will enable us to judge the performance of these models in the estimation of the theoretical value.

The snapshot analysis examines the degree of year-to-year correlation between the value of the business using DCF's valuation models and the Ohlson model and the value of the securities on the Tunisian securities exchange.

Presentation of the econometric model:

$$P_{it} = a + b\,V_t^{H1,i} + \varepsilon_{it} \quad (5)$$

where,
$V_t^{H1,i}$: the value of title *i* to year *t* calculated using the Ohlson model over a two-year estimation horizon;
$P_{t,i}$: the price of the title *i* at the end of the year *t*.

4.3. Measurement of variables

4.3.1. Free cash flow

The available cash flow is calculated as follows:
Free cash flow = Net income + Non-cash expenses + Increase in working capital – Capital expenditures.

4.3.2. The discount rate

We will use the cost of equity (K_e) calculated according to the CAPM (capital asset pricing model) for the Ohlson model.

$$K_e = R_F + \beta_i(E(R_m) - R_F) \quad (6)$$

where,
K_e: cost of equity;
β: the coefficient of the volatility of the action *i* compared to the market.

$$\beta = \frac{cov(R_i, R_m)}{var(R_m)}$$

R_{it}: the rate of return of the security *i* at the date *t*.

$$R_{it} = \frac{C_{it} - C_{it-1} + D_{it}}{C_{it-1}}$$

C_{it}: the course of the company *i* at the beginning of the period *t*;
C_{it-1}: the course of the company *i* at the date *t-1*;
D_{it}: dividend of the company *i* at date *t*;
R_m: market rate of return.

$$R_{mt} = \frac{I_{mt} - I_{mt-1}}{I_{mt-1}}$$

I_{mt}: the market index;
R_F: the risk-free rate in the Tunisian financial market during our study period.

$$WACC = \left(\frac{equity}{totalassets}\right)K_e + K_d(1-T)\left(\frac{liability}{totalassets}\right) \quad (7)$$

where,
$WACC$: the weighted average cost of capital, is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted;
K_e: the cost of equity calculated according to the CAPM;
K_d: the cost of debt;
T: tax rate.

$$The\ abnormal\ benefit = (ROE_h - K_e)\,CP_{h-1} \quad (8)$$

$$ROE_h = \frac{earnings}{CP_h}$$

CP_h: book value of equity.

5. RESULTS

Table 1 presents the value of the securities according to the Ohlson model over a two-year estimation horizon as well as the results of the analysis in instantaneous cuts.

Table 1. Company values according to the Ohlson model

	V12/2	V13/2	V14/2	V15/2
Mean	0.773	0.973	1.524	1.674
Standard deviation	0.103	0.0567	0.021	0.027
t-statistic	3.565	5.091	6.043	6.472
Adj. R^2	0.664	0.755	0.7824	0.873
F-statistic	37.842	62.837	62.521	67.784

The analysis of the correlation between the share price on the Tunis Stock Exchange and its value according to Ohlson's valuation model for all listed companies during the year 2012 to 2015, allows us to conclude the existence of significant explanatory power of the model studied.

This analysis shows the existence of a significant correlation between the price of the share quoted on the Tunis Stock Exchange and its value according to the Ohlson model.

For the year 2015, we find an increase in the degree of the explanatory power of the econometric model. The results of the correlation tests show that for an estimation horizon of two years.

Table 2 presents the securities values according to the free cash flow model over a two-year estimation horizon as well as the results of the analysis in instantaneous cuts.

Table 2. Company values according to the DCF model

	V12/2	V13/2	V14/2	V15/2
Mean	0.245	0.945	0.967	1.356
Standard deviation	0.0125	0.0145	0.0247	0.0235
t-statistic	2.043	1.879	2.045	2.236
Adj. R^2	0.436	0.445	0.546	0.583
F-statistic	24.439	27.369	30.145	31.789

The results from Table 2 show that even the DCF model is significant in determining the firm's value. However, it is less correlated to the market price than the Ohlson model.

The explanatory power of the DCF model is weaker than the explanatory power of the Ohlson model which confirms our hypothesis.

To reinforce our results, we verify our hypothesis differently by calculating the expectancy and the variance of the signed prediction error of the two study models, namely the model DCF and Ohlson model.

Examination of Table 3 on the measurement of esperances and variances of signed predictions error from the different valuation models reveals the following conclusions.

Table 3. Expectations and variances of the different errors

Year	SPE (DCF)		SPE (Ohlson)	
	E	V	E	V
2012	0,583	0,143	-0,256	0,070
2013	-0,08	0,382	-0,18	0,191
2014	0,146	0,511	-0,344	0,039
2015	0,277	0,651	-0,42	0,053

The Ohlson model SPE has the lowest esperance and variance over our study period. The Ohlson model has the lowest variance during the period of studying.

This means that the intrinsic value calculated according to the Ohlson model is the closest to the market value observed of Tunisian listed companies from 2012 to 2015. Our results are similar to those found by Penman and Sougiannis (1998) who likened the Ohlson model to the RIVM and found the superiority of RIVM over DCF and DDM. Lee and Swaminathan (1998), Francis, Ohlson, and Oswald (2000), Courteau et al. (2000), Tham (2001), concluded that the Ohlson model is more efficient in estimating intrinsic values than the DDM and DCF models.

Indeed, the Ohlson model (1995) made a hit in the market-based accounting research, because the financial information was considered as a value component. This model underlies the traditional belief that the company value is compounded of two main parts: the net value of the investment made in it (book value) and the present value of the period benefits (earnings) that together bring the "clean surplus" concept of the shareholders' equity value. Specifically, Ohlson (1995) motivates the adoption of the historical price model in value relevance studies, which expresses value as a function of earnings and book values.

Book value and earnings perform a central reference role in the companies' valuation process. However, the way that both variables impact the price behavior in the market remains a question to answer. There are empirical results of different markets that bring some references of what to expect with the Tunisian data (Nasfi & Albouy, 2020), but in general, the knowledge about how the accounting variables interact in the value generation is still restricted.

6. CONCLUSION

Our research of the Ohlson model suggests that it extends the literature on valuation. It has allowed us to review empirical research to test the robustness of Ohlson's evaluation model. This model, which is qualified as an accounting model, upon the more solid foundation of Modigliani and Miller (1963). Finally, the model is elegant and lends itself to extensions that analyze accounting issues such as conservatism and growth, as demonstrated by Feltham and Ohlson (1995) and Lo and Lys (1999).

The Ohlson model considers that accounting data is an instrument for measuring the company's capacity to create value and it is not only a simple indicator of the company's potential to distribute dividends.

The objective of our empirical analysis was to analyze the degree of correlation between the price of the listed security in the Tunisian financial market and its value calculated on the basis of Ohlson's valuation model. As a result, our research answered the following fundamental question: Are the prices of shares listed on the Tunis Stock Exchange correlated with their values calculated by Ohlson's valuation model? Regarding the analysis on annual data, our research has shown the existence of a significant correlation for all years studied and whatever the horizon of the estimate chosen, except for the year 2012. In fact, 2012 is a year of transition

that comes just after the revolution. It requires an in-depth analysis of the fact that agents are wary of accounting data since there is too much talk of fraud and corruption.

Kothari and Sloan (1992) estimate that the disconnect between the financial market and accounting is essentially due to the manipulation of accounting results since the variation in future stock prices leads to the variation of the anticipated accounting results.

Thus, this correlation between the share price and its value according to the Ohlson model varies from one year to another to reach percentages of explanation, in 2015, greater than 67%. Indeed, this high degree of correlation for the year 2015 can be explained by the upward trend in the Tunis Stock Exchange that existed between 2012 and 2013 and ended in 2015. Therefore, we can say that after the revolution, the actors in the Tunisian financial market are increasingly using accounting data when determining the price of the transaction and rewarding companies with sound financial indicators. This last conclusion supports the idea that the accounting information used in Ohlson's valuation model is becoming increasingly useful for investors' decision-making.

This is explained by the fact that the theoretical works of Ohlson (1995) and Feltham and Ohlson (1995) start from a logic based on the distribution of wealth (model of the discounted dividends) to orient their analysis towards the measurement of the creation of wealth from the model. Residual income discounted. According to Lee (1999), the measurement of the value of a firm through residual income emanates from the empirical work in financial economics of Preinreich (1938) – later taken up in the research work of Edwards and Bell (1961) and Peasnell (1982). Generally speaking, this model expresses the value of a company by the sum of capital invested and future wealth created by the company. When translated into accounting terms, the model becomes equal to the sum of the carrying amount of the equity and the discounted residual income.

The valuation approach by abnormal profits is considered as a "mixed" approach to value because it includes information from the balance sheet and the income statement.

From a theoretical point of view, the valuation approach based on abnormal profits is part of an overall financial valuation approach to the wealth created by the company.

REFERENCES

1. Ali, A., & Pope, P. F. (1995). The incremental information content of earnings, funds flow and cash flow: The UK evidence. *Journal of Business Finance and Accounting, 22*(1), 19-34. https://doi.org/10.1111/j.1468-5957.1995.tb00669.x
2. American Accounting Association's Financial Accounting Standards Committee (AAA FASC), Ohlson, J. A., Penman, S., Bloomfield, R., Christensen, T. E., Colson, R.,…Watts, R. L. (2010). A framework for financial reporting standards: Issues and suggested model. *Accounting Horizons, 24*(3), 471-485. https://doi.org/10.2308/acch.2010.24.3.471
3. Atiase, R. K., & Tse, S. (1986). Stock valuation models and accounting information: A review and synthesis. *Journal of Accounting Literature, 5,* 1-33.
4. Badu, B., & Appiah, K. O. (2018). Value relevance of accounting information: An emerging country perspective. *Journal of Accounting & Organizational Change, 14*(4), 473-491. https://doi.org/10.1108/JAOC-07-2017-0064
5. Ball, R., & Brown, P. (1968). An empirical evaluation of accounting incomes numbers. *Journal of Accounting Research, 6*(2), 159-178. https://doi.org/10.2307/2490232
6. Barth, M. E., Clinch, G., & Israeli, D. (2016). What do accruals tell us about future cash flows? *Review of Accounting Studies, 21,* 768-807. https://doi.org/10.1007/s11142-016-9360-4
7. Barth, M. E., Li, K., & McClure, C. G. (2017). *Evolution in value relevance of accounting information* (Stanford University Graduate School of Business Research Paper No. 17-24). http://doi.org/10.2139/ssrn.2933197
8. Beaver, W. (1968). The information content of annual earnings announcements. *Journal of Accounting Research, 6,* 67-92. https://doi.org/10.2307/2490070
9. Bernard, V. L. (1995). The Feltham-Ohlson framework: Implications for empiricists. *Contemporary Accounting Research, 11*(2), 733-747. https://doi.org/10.1111/j.1911-3846.1995.tb00463.x
10. Chaney, P. K., & Lewis, C. M. (1999). Earnings management and firm valuation under asymmetric information. *Journal of Corporate Finance, 1*(3-4), 319-345. https://doi.org/10.1016/0929-1199(94)00008-I
11. Clout, V., Falta, M., & Willett, R. J. (2015). *Fundamental relations between market and accounting values* (UNSW Business School Research Paper No. 2015ACCT01). http://doi.org/10.2139/ssrn.2564412
12. Courteau, L., Kao, J. L., & Richardson, G. D. (2000). *The equivalence of dividend, cash flows and residual earnings approaches to equity valuation employing ideal terminal value expressions.* https://doi.org/10.2139/ssrn.233399
13. Courteau, L., Kao, J. L., & Richardson, G. D. (2013). Equity valuation employing the ideal versus ad hoc terminal value expressions. *Contemporary Accounting Research, 18*(4), 625-661. https://doi.org/10.1506/77TK-1N3Q-82QU-UATR
14. Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Financial Economics, 18*(1), 3-42. https://doi.org/10.1016/0165-4101(94)90016-7
15. Dumontier, P., & Labelle, R. (1998). Accounting earnings and firm valuation: The French case. *European Accounting Review, 7*(2), 163-183. https://doi.org/10.1080/096381898336439
16. Dumontier, P., & Raffournier, B. (2002). Accounting and capital markets: A survey of the European evidence. *European Accounting Review, 11*(1), 119-151. https://doi.org/10.1080/09638180220124761
17. Durand, D. (1957). Growth stocks and the Petersburg paradox. *Journal of Finance, 12*(3), 348-363. https://doi.org/10.1111/j.1540-6261.1957.tb04143.x
18. Edwards, E. O., & Bell, P. W. (1961). *The theory and measurement of business income* (3rd ed.). https://doi.org/10.1525/9780520340626
19. Feltham, G. A., & Ohlson, J. A. (1999). Residual earnings valuation with risk and stochastic interest rates. *Accounting Review, 74*(2), 165-183. https://doi.org/10.2308/accr.1999.74.2.165
20. Feltham, G., & Ohlson, J. A. (1995). Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research, 11*(2), 689-731. https://doi.org/10.1111/j.1911-3846.1995.tb00462.x
21. Gilbert, P., & Yalenios, J. (2017). L'évaluation de la performance individuelle. *La Découverte, 128.*

22. Gunaratne, Y. M., & Anuradha, P. A. N. (2017). Value relevance of accounting information in explaining stock returns in Sri Lanka. *International Journal of Business and Management, 12*(10), 223-233. https://doi.org/10.5539/ijbm.v12n10p223

23. Hand, J. R. M., & Landsman, W. R. (1998). *Testing the Ohlson model: V or not v, that is the question.* https://doi.org/10.2139/ssrn.126308

24. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

25. Kalantonis, P., Schoina, S., Missiakoulis, S., & Zopounidis, C. (2020). The impact of disclosed R&D expenditure on the value relevance of accounting information: Evidence from Greek listed firms. *Mathematics, 8*(5), 730. https://doi.org/10.3390/math8050730

26. Karathanassis, G. A., & Spilioti, S. N. (2002). An empirical investigation of the traditional and the clean surplus valuation models. *Managerial Finance, 29*(9), 55-66. https://doi.org/10.1108/03074350310768472

27. Kothari, S. P., & Sloan, R. G. (1992). Information in prices about future earnings: Implications for earnings response coefficients. *Journal of Accounting and Economics, 15*(2-3), 143-171. https://doi.org/10.1016/0165-4101(92)90016-U

28. Kothari, S. P., & Zimmerman, J. L. (1995). Price and return models. *Journal of Accounting and Economics, 20*(2), 155-192. https://doi.org/10.1016/0165-4101(95)00399-4

29. Lee, C. M. C. (1999). Accounting-based valuation: Impact on business practices and research. *Accounting Horizons, 13*(4), 413-425. https://doi.org/10.2308/acch.1999.13.4.413

30. Lev, B., & Thiagarajan, S. R. (1993). Fundamental information analysis. *Journal of Accounting Research, 31*(2), 190-215. https://doi.org/10.2307/2491270

31. Li, K. K., & Mohanran, P. S. (2014). Evaluating cross-sectional forecasting models for implied cost of capital. *Review of Accounting Studies, 19,* 1152-1185. https://doi.org/10.1007/s11142-014-9282-y

32. Lo, K., & Lys, T. (1999). The Ohlson model: Contribution to valuation theory limitations, and empirical applications. *Journal of Accounting, Auditing & Finance, 15*(3), 337-367. https://doi.org/10.1177/0148558X0001500311

33. McInnis, J. M., Yu, Y., & Yust, C. H. (2018). Does fair value accounting provide more useful financial statements than current GAAP for banks? *Accounting Review, 93*(6), 257-279. https://doi.org/10.2308/accr-52007

34. Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *Journal of Business, 34*(4), 411-433.https://doi.org/10.1086/294442

35. Modigliani, F., & Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review, 53*(3), 261-297. https://www.jstor.org/stable/1809167

36. Myers, J. (1999). Implementing residual income valuation with linear information dynamics. *The Accounting Review, 74*(1), 1-28. https://doi.org/10.2308/accr.1999.74.1.1

37. Nasfi, F. S., & Albouy, M. (2020). Information comptable et prévisions boursières: Le cas Tunisien. *Recherches en Sciences de Gestion, 136,* 231-252. https://doi.org/10.3917/resg.136.0231

38. Ohlson, J. A. (1995). Earnings, book values and dividends in equity valuation. *Contemporary Accounting Research, 11*(2), 661-687. https://doi.org/10.1111/j.1911-3846.1995.tb00461.x

39. Ohlson, J. A. (2001). Earnings, book values and dividends in equity valuation: An empirical perspective. *Contemporary Accounting Research, 18*(1), 107-120. https://doi.org/10.1506/7TPJ-RXQN-TQC7-FFAE

40. Ou, J. A., & Penman, S. H. (1989). Accounting measurement, price earnings ratio, and the information content of security prices. *Journal of Accounting Research, 27,* 111-152. https://doi.org/10.2307/2491068

41. Paquet, G. (1996). Distributed governance and transversal leadership. In J. E. Trent, R. Young, & G. Lachapelle (Eds.), *Québec-Canada: What is the path ahead?/Nouveaux sentiers vers l'avenir* (pp. 317-332). Ottawa, Canada: The University of Ottawa Press.

42. Peasnell, K. V. (1982). Some formal connections between economic values and yields and accounting numbers. *Journal of Business Finance and Accounting, 9*(3), 361-381. https://doi.org/10.1111/j.1468-5957.1982.tb01001.x

43. Pène, D. (1993). *Evaluation et prise de contrôle de l'entreprise.* Paris, France: Economica.

44. Penman, S. H. (2012). *Financial statement analysis and security valuation* (5th ed.). New York, NY: McGraw Hill.

45. Penman, S. H., & Sougiannis, T. (1998). A comparison of dividend, cash flow, and earnings approaches to equity valuation. *Contemporary Accounting Research 15*(3), 343-383. https://doi.org/10.1111/j.1911-3846.1998.tb00564.x

46. Rodosthenous, M. (2017). Value relevance of accounting information in the early years of crisis in Greece. *Economics, Business Social Sciences and Education, 16*(1), 40-47. Retrieved from http://journal.uniwa.gr/index.php/economy/article/view/ValueRelevance

47. Saha, A., & Bose, S. (2017). The value relevance of financial and non-financial information: Evidence from recent academic literature. In M. Ojo, & J. Van Akkeren (Eds.), *Advances in finance, accounting, and economics* (pp. 1907-1938). http://dx.doi.org/10.4018/978-1-5225-1900-3.ch015

48. Senthilnathan, S. (2013). Testing the relevance of good will amortization within the Ohlson (1985) value relevance model using share returns. *International Journal of Innovative Research and Practices, 1.* Advance online publication.

49. Senthilnathan, S. (2015). Theoretical role of the most recent prior period's equity price in value relevance studies. *Journal for Advanced Research in Commerce and Management Studies, 2*(2), 49-68. Retrieved from https://www.researchgate.net/publication/279535757_THEORETICAL_ROLE_OF_THE_MOST_RECENT_PRIOR_PERIOD'S_EQUITY_PRICE_IN_VALUE_RELEVANCE_STUDIES

50. Silvestri, A., & Veltri, S. (2012). A test of the Ohlson model on the Italian Stock Exchange. *Accounting & Taxation, 4*(1), 83-94. Retrieved from http://www.theibfr2.com/RePEc/ibf/acctax/at-v4n1-2012/AT-V4N1-2012-7.pdf

51. Tham, J. (2001). *Equivalence between discounted cash flow (DCF) and residual income (RI).* https://doi.org/10.2139/ssrn.261126

52. Tremblay, D., Cormier, D., & Magnan, M. (1993). *Théories et modèles comptables: Développement et perspectives* (2ème éd.). Quebec, Canada: Presses de l'Université du Québec.

53. Uthman, A. B., & Abdul-Baki, Z. (2014). The value-relevance of accounting information in Nigeria: Analysts' perception in the IFRS regime. *Journal of Accounting Management, 4*(1), 43-60. Retrieved from http://journals.univ-danubius.ro/index.php/jam/article/view/2263

54. Vijitha, P., & Nimalathasan, B. (2014). Value relevance of accounting information and share price: A study of listed manufacturing companies in Sri Lanka. *Merit Research, Journal of Business and Management, 2*(1), 1-6. Retrieved from https://meritresearchjournals.org/bm/content/2014/January/Vijitha%20and%20Nimalathasan.pdf

55. Zuraida, Z., Houqe, N., & van Zijl, T. (2016). *Value relevance of environmental social and governance disclosure* (Working Paper No. 98). Retrieved from http://hdl.handle.net/10063/4176