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MODELING THE IMPACT OF ACCOUNTING CONSERVATISM ON INFORMATION BEHAVIOUR IN EQUITY VALUATION BASED ON PLS-SEM

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ABSTRACT

Based on residual income valuation models, this study used PLS-SEM with a formative approach to investigate the moderating effects of conservative policies on the relation between accounting information of the current and lagged periods with the equity value of companies listed on the Tehran Stock Exchange. The sample consisted of 149 companies from 2012 to 2019. The moderating effect of conditional/unconditional accounting conservatism on the relation between current/lagged accounting information and equity value is insignificant at the 10% level. In contrast, conditional conservatism has a significant relation with current/lagged accounting information, current/lagged market information, and equity values. Unconditional conservatism has significant relation with current/lagged accounting information, lagged market information, and equity values. Unconditional conservatism, however, has no significant relation with the current market information. Referring to Ohlson's vision (1995) on the expected long-term convergence between book value and market equity value, this paper's findings show that the current/lagged book value constitutes the structure of linear dynamics used in the residual income valuation model; therefore, the dynamics in residual income evolve on the dynamics of book value and market equity value.

JEL Classification: C2, C3, C5, D4

Keywords: Accounting information dynamics, Accounting conservatism, Equity valuation, PLS-SEM, Formative approach

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1. INTRODUCTION

Residual income valuation models attempt to discover a theoretical relation between equity values and reported information in financial statements (Ohlson, 1995; Peasnell, 1982; Edwards and Bell, 1961). One of the major problems in this area is how explored and justified are the distortions created by different accounting policies. Accounting conservatism is one of these policies being investigated. Today, most theoretical advances in valuation models are about the effect of accounting conservatism on valuation models (Ashton and Wang, 2008; Feltham and Ohlson, 1995), but the specification of the functional dependency due to conservatism has been less pronounced. In this regard, Al Ani and Chong (2021) found when Oman firms smooth their earnings, there is no significant effect of accounting conservatism on earning quality. Although the researchers introduced models of how accounting policies affect residual income model structure, the empirical support for these models is often weak and contradictory. Neglecting the adjustment of dirty surplus items leads to a bias in the equity valuation functions (Ashton, Tippett, and Wang, 2004). Hence, in order to control the bias, the impact of conditional and unconditional conservatism in accounting should be included in the models.

Therefore, the multiple effects and failures outlined have required simultaneous investigation of the linear information dynamics. This empirical study on the companies listed on the Tehran Stock Exchange (TSE) assesses some issues in this regard, which include the main structure of the residual income model and the efficiency of conditional and unconditional conservatism measures in accounting. Researchers have recently introduced the main concept of the linear dynamics of accounting information. They have found that the residual income valuation models have a one-to-one correlation with the accounting information in equity valuation, and how earnings and book values evolve over time or correlate with the time-series property of abnormal earnings; these show Brownian motions in the Wiener process.

The next section offers a review of the theoretical literature; the third section introduces modeling the effect of conservatism on the linear dynamics of accounting information and on the valuation models. In the following, hypotheses about the dependence of these parameters on the degree of conservatism and the research method are

stated. The fourth and fifth section point out the analytical structure for results and the conclusion, respectively.

2. REVIEW OF THEORETICAL LITERATURE

Theoretical literature on the linear dynamics of accounting information is based on the neoclassical school, in which the concepts of clean surplus relation (CSR) and dirty surplus items are expressed in the Wiener process (Clubb, 2013; Ashton et al., 2004; Ashton, Cooke, and Tippett, 2003; Ohlson, 1995). Wiener process is a continuous-time stochastic process over time that is called the standard Brownian motion process (Mörters and Peres, 2008). This process is one of the most recognizable processes with independent increments and stationary distribution. It plays an important role in both pure and applied mathematics, finance, economics, and physics. This, W_t, is called Wiener process, if a process simultaneously is characterized by the following terms:
(1) Almost surely, $W_0 = 0$, (2) W_t, certainly continued all the time.
(3) W_t has independent and stationary increments, and (4) it has Gaussian increments, as follows: For $0 \leq t < s$, then, $W_t - W_s \sim N(0, t-s)$, the last term refers to a normally distributed process, $\mathrm{N}(\mu, \sigma^2)$. A condition in which the increments are independent, so, if $0 \leq s_1 < t_1 \leq s_2 < t_2$, $W_{t1} - W_{s1}$ and $W_{t2} - W_{s2}$, are independent random variables (Mörters and Peres, 2008).

Many researchers have used this to explain accounting information dynamics (See, for example, Ashton and Wang, 2013, 2015; Ashton et al., 2004; Ashton et al., 2003; Myers, 1999; Ohlson, 1995).

Ohlson (1995), Ashton et al. (2003), Ashton et al. (2004), and Ashton and Wang (2013) used the first-order autoregressive process i.e. AR(1), to express the dynamics of abnormal earnings; then they explained the linear dynamics of accounting information in securities valuation.

If accounting conservatism is the only process that delays recognition of economic earnings, ceteris paribus, so one can see that a method for examining this issue is to identify the effect of conservatism on the linear information dynamics (Ashton and Wang, 2015). Several researchers such as Feltham and Ohlson (1995) and Myers (1999) state that by adding a lagged book value in the model, accounting conservatism is reflected in the information dynamics; then, the degree of conservatism increases positively. Some empirical

studies, however, find various weights for book value in the formulation of linear dynamics (Choi, O'Hanlon, and Pope, 2006; Myers, 1999; Dechow, Hutton, and Sloan, 1999).

Pope and Wang (2005), Clubb (2013), Ashton and Wang (2013) showed that the linear dynamics structure used in the residual income valuation model requires using lagged book value, and current book value. Conservatism is related to the leverage, size, and firms' growth opportunities. Since conservatism varies across industries, leverage and growth opportunities change across industries (Ashton and Wang, 2013). Basu (1997) examined the concepts and measurement of conditional conservatism in accounting. Following him, Khan and Watts (2009) developed the C-score, which is a linear function of the firm's specific characteristics. They promoted a conservative indicator by using three variables, including market to book (M/B) value, size, and leverage. The C-score is a proxy for conservatism policies and an additional test of relations between accounting conservatism and valuation parameters (Khan and Watts, 2009). Ashton and Wang (2013) tested the dependency of the valuation function coefficients on two different conservatism criteria including the M/B and C-score (Khan and Watts, 2009). The M/B is a natural criterion for accounting conservatism (Fama and French, 1995, 1993, 1992). Despite its shortcomings and limitations, this ratio is a useful measure. Basically, it is a measure of conservatism in the balance sheet, mainly due to asset undervaluation (Ashton and Wang, 2013). The weakness is that this criterion includes elements of financial policies that are not necessarily related to accounting conservatism. Fama and French (1992, 1993, 1995) also asserted that M/B includes opportunities for corporate growth. Since it is viewed as a leading indicator for companies, this could be a useful benchmark in predicting stock return expectations.

3. EQUITY VALUES' DYNAMICS AND CONSERVATISM

A set of reported accounting information is assumed to exist, including book value of equity (b_t), a period lag in book value (b_{t-1}), earnings (x_t), and dividends (d_t). Assuming that the CSR is held due to accounting conservatism, the reporting system has a bias, and this system is the source of reported transactions in a hypothetical accounting system without bias but invisible. An unbiased system refers to an expected long-term convergence between book value and market value of equity, which means that wealth is measured in terms of unbiased book values (Ohlson, 1995). In the long run, this measure

is close to market values, but in the short term, unbiased book values and market values are divergent to the extent that the residual incomes are positive or negative. Therefore, the following theorem of Ohlson (1995) is true:

$$\lim_{s\to\infty} E_t[P_{t+s} - b'_{t+s}] = \lim_{s\to\infty} E_t[P_{t+s} - (1+\chi)b_{t+s}] = 0 \quad (1)$$

In addition to accounting conservatism, other reasons, such as earnings manipulations, can lead to bias in accounting information (Ashton and Wang, 2013). Accounting consistency causes unchanged procedures in different periods, so long-term uniformity is assumed in accounting policies. Inflation even with low and moderate rates can lead to significant bias in the valuation models, so, in historical cost accounting, the change in inflation over time may cause drift in the degree of conservatism. Hence, in the conditional conservatism of the Basu model (1997), the size and arrival rate of good news have a random motion.

Ohlson's (1995) modeling begins with an unbiased accounting system, and then it states how, and to what extent, conservatism policies affect the accounting fundamental items in equity valuation. The model assumes that economic rents follow a first-order autoregressive dynamical process, i.e., AR(1), In Ohlson's opinion, the expected economic rents without bias (x'_t) are reduced by competition such that rents are reduced by the rate (ω), in which $x'_t = e'_t - (R-1)b'_{t-1}$, and R is equal to 1 plus the cost of capital, as shown in the following equation:

$$x'_{t+1} = \omega x'_t + \varepsilon_{t+1} \quad (2)$$

In equation (2), ε_{t+1} is an error term with the mean zero. An economic rent refers to the abnormal earnings, as given in the Ohlson (1995) residual income model:

$$V_0^E = b_0 + \sum_{t=1}^{\infty} \frac{E(EARN_t - r_E * b_{t-1})}{(1+r_E)^t} \quad (3)$$

The above model states that a firm's equity value is equal to its book value plus the discounted value of its future earnings. Residual income is defined as the difference between the firm's accounting earnings and expected return on equity book value.

Analysts' valuations are usually based on predicting core operating earnings over the long run. For modeling, comprehensive

income is divided into two parts: core operating earnings (ce_t), and dirty surplus earnings (de_t). Then, CSR is $b_t = b_{t-1} + ce_t + de_t - d_t$. Therefore, according to Ohlson (1995), dirty surplus earnings can be estimated from the difference between increases in book value and (core) operating earnings, that is, $[(b_t - b_{t-1}) - ce_t]$. Similarly, equity valuation can be expressed in terms of opening book value and abnormal core earnings using CSR, so the term abnormal operating earnings (x_t) is defined by the following relation: $x_t = ce_t - (R - 1)b_{t-1}$, which shows the residual income relation. Assuming that in the successive periods, long-term economic rents are reduced by competition, as noted in equation (2), then changes in dirty surplus items are unpredictable[1]. By the way, macroeconomic policies could make rents in emerging economics, hence equity prices and macroeconomic variables such as interest rates and inflation cointegrate, so, the stock prices contain valuable information for future variations in macroeconomic variables especially the price level (Ibrahim and Yusoff, 2001). Of course, many factors and pandemics such as Covid-19 affect the accounting measures such as conservative accounting practices (Cui et al., 2021). Olayinka (2021) proved that interest rate is a significant and relevant instrument for curbing inflation in the long run but not for the short run. So, these findings show the results may change in different conditions.

In Lintner's analysis (1956) on dividend policy, assumed dividends are equal to $1+g$ times the previous year's dividends, adjusted by the extent to which abnormal earnings exceed or fall short of this growth target. Stock prices can be written using the terms of book value, earnings, dividends, and the capital markets do not have any arbitrage opportunities, so the information dynamics generated by the reporting system should be adjusted due to conservative accounting policies (Pope and Wang, 2005). Based on the above arguments, we want to know if "conservative accounting policies moderate the behavior of accounting information on equity valuation?" So, two hypotheses are set:

(A) The conservative accounting policies moderate the coefficients of equity book value, current operating income, abnormal earnings, and dividends for equity valuation.

(B) The conservative accounting policies moderate the coefficients of lagged variables of equity book value, operating income, abnormal earnings, and dividends for equity valuation.

4. RESEARCH METHODOLOGY

This study seeks to model the behavior of accounting information in equity valuation. Based on the residual income model and a PLS-SEM with a formative approach, we examined the dynamics of accounting information and the moderating effect of conservative accounting policies on the relation between accounting information and market equity value of companies. Out of 520 companies listed on TSE, using a screening method for sampling, 149 companies were selected from 2012 to 2019.

In this article, the main components of SEM include formative measurement models and the structural model. Appendix 1 shows the indicators for the formation of (current/lagged) accounting information constructs, and (current/lagged) market information constructs. Based on prior studies, relevant indicators were extracted from the financial statements of sample companies. Appendix 2 describes how to calculate the variables.

Validity and reliability of constructs in formative measurement models were investigated by convergent validity, the multicollinearity to assess the variance inflation factor (VIF) of the indicators, and the significant level and proportionality of external weights. In the next step, the structural model is evaluated by the model's predictability, multicollinearity between the constructs, the significant level, and proportionality of the structural model relations, the R^2 values, the size and significance of the path coefficients, and the effect size (f^2). Finally, the model goodness-of-fit (GoF) is assessed.

5. RESEARCH FINDINGS

The formative measurement models have been used because: (1) they are based on the assumption that the indicators are the cause of the constructs, (2) an important feature of these models is that the indicators are not interchangeable, i.e. the indicators measure various aspects of a construct, and each indicator embraces a particular aspect of the construct domain, and (3) all the indicators together form the concept of the construct, which indicates that removing an indicator potentially changes the nature of the construct (Hair et al., 2017).

5.1 ASSESSMENT OF FORMATIVE MEASUREMENT MODELS

Step 1: To evaluate the convergent validity, redundancy analysis should be used (Chin, 1998). A magnitude of 0.9, or at least 0.8 and above (or R^2 value equal to 0.81 or at least 0.64), is desirable for the path correlation between the formative construct and the reflective construct (Chin, 1998). Lack of convergent validity indicates that the indicators of the formative construct lack sufficient level of participation to create the desired construct.

FIGURE 1
Redundancy Analysis the Relation between Current Accounting Information and Equity Value

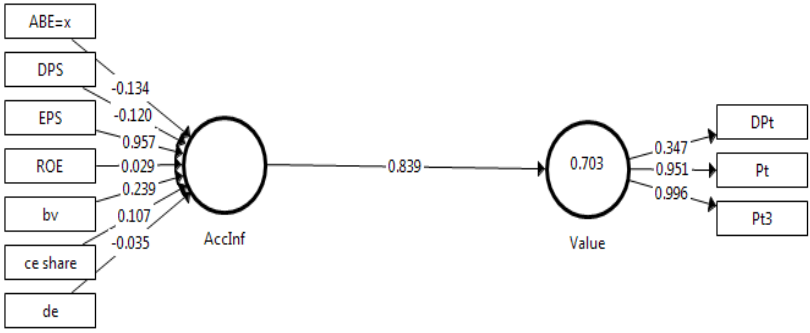
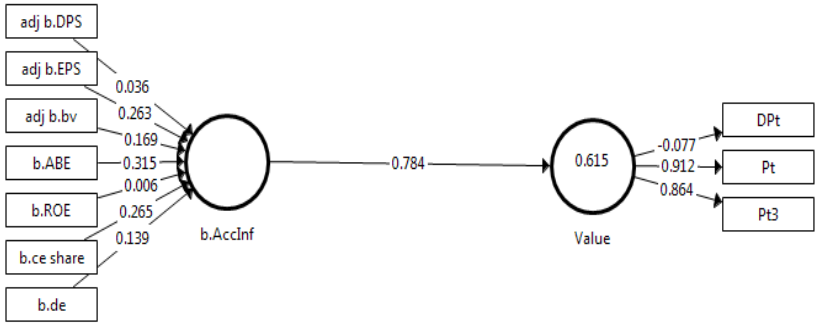


Figure 1 shows the correlation between the construct of current accounting information and the firm's equity value with R^2 values 0.839 and 0.703, respectively. As they are more than the minimum expected value (i.e. 0.64), the formative indicators contribute a sufficient level of participation to promote the desired construct.

Following is Figure 2 showing the correlation between the construct of lagged accounting information and the firm's equity value with R^2 values 0.784 and 0.615, respectively. As the second value is less than the minimum expected value (i.e. 0.64), the indicators of the formative construct do not have a sufficient level of participation to describe the content of the construct.

FIGURE 2
Redundancy Analysis the Relation between Lagged Accounting Information and Equity Value



In the first step, however, it cannot be judged only on the basis of the redundancy analysis to remove construct or indicators, hence other appraisals should be carried out.

Step 2: To evaluate the multicollinearity of the formative measurement models, the tolerance level of less than 0.2 (or VIF above 5) in the predictive constructs indicates collinearity (Hair et al., 2017).

TABLE 1
The Collinearity of Outer Model

Indicators	VIF	Indicators	VIF	Indicators	VIF
ABE=x	167.771	adj b.DPS	3.443	P_t	4.577
BM	1.000	adj b.EPS	6.309	P_{t3}	4.313
Beta	1.008	adj b.BV	2.547	R	1.478
Cscore2	1.000	b.ABE	6.632	ROE	1.395
DPS	3.631	b.Beta	1.003	b.de	1.886
DP_t	1.276	b.EY	1.445	BV	3.515
EPS	208.175	b.R	1.443	ce share	5.000
EY	1.486	b.ROE	1.242	de	3.948
Gscore2	1.000	b.ce share	3.547		

As shown in Table 1, the VIF of current abnormal earnings (=167.77), current earnings per share (= 208.17), lagged earnings per share (= 6.31), and lagged abnormal earnings (= 6.63) show multicollinearity. Consequently, these indicators have been removed from the model.

Step 3**:** To evaluate the contribution of the formative indicator, and its relative contribution, the outer weight of the

indicators should be assessed (Hair et al., 2017). Since the constructs are formed with their formative indicators by the linear combination of indicator values and outer weights, implementing such multiple regression analysis results in a value of R^2 equal to one. The outer weights can be compared and used to determine the relative contribution or relative importance of each in the construct. Estimated values of formative measurement models are much smaller than the outer loads of reflective indicators.

In the following Table 2 we show the outer weights of this research's initial model; because this study is based on exploratory factor analysis, the significance level was considered as 10%. The outer weights of the following indicators are insignificant in Table 2: beta, dividends (DPS), lagged book value (adj b.BV), lagged beta (b.beta), lagged annual returns (b.R), lagged return on equity, (b.ROE) and equity book value (BV).

TABLE 2
Outer Weights for the Model

	Sample Mean	Standard Deviation	T	Sig.
Beta -> MarketInf	0.076	0.084	0.932	0.352
DPS -> AccInf	-0.137	0.128	1.065	0.287
DP_t <- Value	0.147	0.049	2.877	0.004
EY -> MarketInf	0.609	0.226	2.786	0.006
P_t <- Value	0.479	0.020	24.320	0.000
P_{t3} <- Value	0.473	0.018	25.983	0.000
R -> MarketInf	0.489	0.234	2.125	0.034
ROE -> AccInf	0.168	0.085	1.884	0.060
adj b.DPS -> b.AccInf	0.197	0.085	2.430	0.015
adj b.BV -> b.AccInf	-0.022	0.119	0.044	0.965
b.Beta -> b.marketInf	0.151	0.125	1.191	0.234
b.EY -> b.marketInf	0.955	0.082	11.563	0.000
b.R -> b.marketInf	0.047	0.136	0.566	0.572
b.ROE -> b.AccInf	0.008	0.047	0.022	0.982
b.ce share -> b.AccInf	0.752	0.107	6.968	0.000
b.de -> b.AccInf	0.284	0.078	3.532	0.000
BV -> AccInf	0.087	0.120	0.742	0.459
ce share -> AccInf	0.765	0.123	6.285	0.000
de -> AccInf	0.348	0.110	3.185	0.002

TABLE 3
Outer Loadings for the Model

	Sample Mean	Standard Deviation	T	Sig.
Beta -> MarketInf	0.047	0.089	0.385	0.700
DPS -> AccInf	0.762	0.047	16.487	0.000
DP_t <- Value	0.306	0.111	2.615	0.009
EY -> MarketInf	0.883	0.107	8.512	0.000
P_t <- Value	0.980	0.018	55.394	0.000
P_{t3} <- Value	0.969	0.023	43.273	0.000
R -> MarketInf	0.833	0.129	6.642	0.000
ROE -> AccInf	0.585	0.078	7.465	0.000
adj b.DPS -> b.AccInf	0.716	0.050	14.529	0.000
adj b.BV -> b.AccInf	0.738	0.052	14.398	0.000
b.Beta -> b.marketInf	0.123	0.140	0.840	0.401
b.EY -> b.marketInf	0.973	0.026	37.807	0.000
b.R -> b.marketInf	0.575	0.094	6.428	0.000
b.ROE -> b.AccInf	0.416	0.094	4.330	0.000
b.ce share -> b.AccInf	0.923	0.030	31.305	0.000
b.de -> b.AccInf	0.570	0.074	7.729	0.000
BV -> AccInf	0.829	0.035	23.751	0.000
ce share -> AccInf	0.919	0.031	30.457	0.000
de -> AccInf	0.614	0.063	9.741	0.000

To exactly determine which indicators should be removed, the outer loadings of indicators, as described in Table 3, should be analyzed: the current beta (beta = 0.034), lagged beta (b.beta = 0.118) and lagged return on equity (b.ROE = 0.405) were less than 0.50 and insignificant, so these indicators are deleted. But, outer loadings of dividends per share (DPS = 0.768), lagged book value (adj b.BV = 0.747), lagged annual returns (b.R = 0.604), and current book value (BV = 0.834) were more than 0.50 and they are insignificant, but according to Hair et al. (2017), they can be preserved in the model.

After evaluating the model in the above three steps, the modified model is obtained. As the maximum outer weight decreases with the number of indicators, the average value of outer weights is significantly reduced with the number of items. Therefore, it is more likely that many formative indicators become unreasonable (Hair et al., 2017). To solve the problem of collinearity, significance and proportionality of the indicators' coefficients, in the proposed models, two constructs called (current/lagged) Market Information have been included.

5.2 STRUCTURAL MODEL ASSESSMENT

Structural models represent the theoretical and conceptual basis of the path model. To determine how much empirical data supports the theory under study and to decide whether the theory has been empirically verified, the results of the structural model should be evaluated.

TABLE 4
Collinearity between Constructs

		1	2	3	4	5	6	7	8
1	AccInf				2.878		3.268		
2	Conditional	1.157			1.231		1.248	1.157	1.093
3	Gscore	1.186			1.188		1.219	1.186	1.020
4	MarketInf						1.239		
5	Unconditional	1.355			1.415		1.422	1.355	
6	Value								
7	b.AccInf				2.794		3.070		1.099
8	b.marketInf								

Table 4 reports the results of collinearity between constructs. Due to the collinearity of the outer model of the (current/lagged) information constructs, each of these are divided into two separate constructs, the accounting information and market information. Then, there is no collinearity between the constructs, as shown in Table 4.

The purpose of PLS-SEM is not only in determining significance of path coefficients in the structural model but also in clarifying the significance and dependency effects. Of course, not only the direct effects of a construct on another but its indirect effects are measured through intermediate constructs. In this case, the sum of the direct and indirect effects, i.e. the total effect is explored and interpreted over a given construct through several intermediary constructs. According to Table 5, these paths including “GScore and AccInf”, “GScore and b.AccInf”, and “GScore and b.MarkInf”, are insignificant, so they are deleted.

TABLE 5
Direct/Indirect/Total Coefficients

	Direct Path		Indirect Effects		Total Effects		f^2	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	t	P Values
AccInf -> MarketInf	0.561	0			0.561	0	2.26	0.024
AccInf -> Value	0.602	0	0.063	0.064	0.665	0	3.08	0.002
Conditional -> AccInf	-0.251	0			-0.251	0	2.61	0.009
Conditional -> MarketInf	-0.118	0.007	-0.043	0.113	-0.161	0	1.28	0.200
Conditional -> Value	0.03	0.349	-0.186	0	-0.156	0	0.34	0.734
Conditional -> b.AccInf	-0.206	0			-0.206	0	2.49	0.013
Conditional -> b.marketInf	-0.123	0.002	-0.056	0	-0.179	0	1.58	0.114
Gscore -> AccInf	0.01	0.849			0.01	0.849		
Gscore -> MarketInf	-0.158	0.006	0.015	0.54	-0.143	0.002	1.63	0.103
Gscore -> Value	-0.134	0	-0.012	0.732	-0.146	0.002	2.08	0.038
Gscore -> b.AccInf	-0.02	0.704			-0.02	0.704		
Gscore -> b.marketInf	0.002	0.965	-0.006	0.71	-0.004	0.928		
MarketInf -> Value	0.113	0.106			0.113	0.106	0.65	0.515
Unconditional -> AccInf	-0.218	0			-0.218	0	2.92	0.004
Unconditional -> MarketInf	-0.072	0.284	-0.023	0.353	-0.095	0.097	0.45	0.652
Unconditional -> Value	-0.208	0	-0.159	0	-0.367	0	2.93	0.004
Unconditional -> b.AccInf	-0.21	0			-0.21	0	2.91	0.004
Unconditional -> b.marketInf			-0.058	0	-0.058	0		
b.AccInf -> MarketInf	-0.472	0			-0.472	0	2.71	0.007
b.AccInf -> Value	0.08	0.179	-0.053	0.063	0.027	0.674	0.49	0.622
b.AccInf -> b.marketInf	0.274	0			0.274	0	2.83	0.005

The indirect effect of the relation between b.AccInf and MarketInf is significant, as shown in Table 5, the direct coefficients and indirect effect of some relations are insignificant, but the coefficients of the total effect are significant and vice versa, henceforth, these relations are not excluded from the model. The moderating effects of accounting conservatism with a two-stage approach are also included in the model, and the results are as follows:

The moderating variables including "Mod1 V.AccIn con", "Mod2 V.AccIn Unc", and "Mod4 V.AccIn Unc" have significant effect on the relation between equity value and current accounting information, with path coefficients of -0.031, -0.17, and -0.175, respectively. The third moderating variable, i.e., "Mod3 V.b.inf con" shows the moderating effect of conditional conservatism on the relation between equity value and lagged accounting information, with a path coefficient of 0.018.

The (conditional/unconditional) accounting conservatism and (current/lagged) accounting information has a significant relation with the equity value at the 1% level. The conditional and unconditional conservatism have a negative, significant relation with the equity values, and the moderating effect of these variables are also negative but insignificant. Unconditional conservatism is a measure of conservatism in the balance sheet, mainly due to undervaluation of assets. The weakness of this criterion is that it incorporates components of financial policies that are not necessarily linked to accounting conservatism. In the last studies, however, the parameters of linear information dynamics, and M/B have been proven for the long run. This suggests that as much as conditional conservatism increases, the equity value decreases, and vice versa; this result is in line with theoretical foundations and previous findings (See for example, Ashton and Wang, 2008, 2013, 2015).

In the final model, before entering the effect of the moderating variables, the values of R^2 and adjusted R^2 related to the equity value are 68.1 and 67.9 percent[2], respectively, and in the following Table 6, the corresponding values are 75 and 74 percent, respectively. This increase is due to adding moderating variables in the model. Meanwhile, their moderating effects are insignificant.

TABLE 6
R^2 and the Adjusted R^2

	R^2	Sig.	Adj. R^2	Sig.
AccInf	0.15	0.00	0.15	0.00
MarketInf	0.19	0.00	0.19	0.00
Value	0.75	0.00	0.74	0.00
b.AccInf	0.12	0.00	0.12	0.00
b.marketInf	0.11	0.00	0.00	0.00

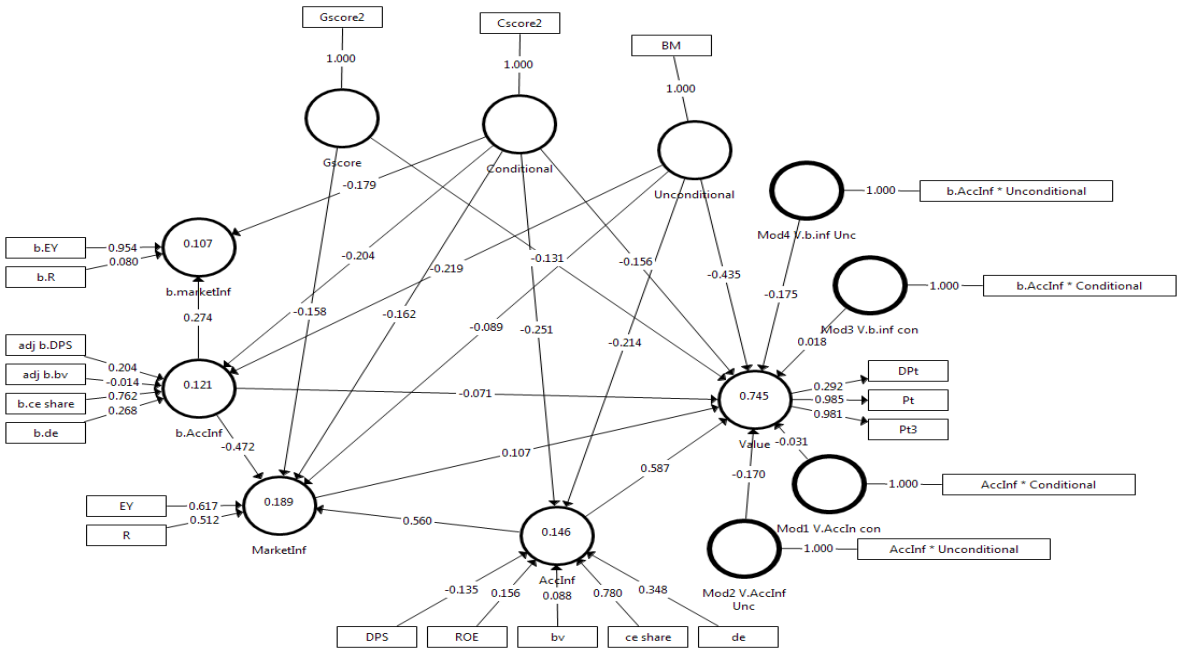
The f^2 is used to assess whether the removed construct has a significant effect on the endogenous construct. The f^2 values of 0.02, 0.15, and 0.35, respectively, show small, medium, and large effects of exogenous variables, respectively. For calculating, equation (4) is used:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}} \quad (4)$$

The change in R^2 is calculated by re-estimating the PLS path model. shows that the effect of conditional conservatism variables on equity values, and the effect of unconditional conservatism on market information, and the effect of lagged accounting information on the equity value is insignificant; but since the theoretical fundamentals support these relations, these relations cannot be ignored. By considering the insignificance of the f^2, one cannot decide to eliminate the relations between the constructs, but the theoretical supports, past studies and the results of other tests should be considered. The final model with the effect of moderating variables is shown in Figure 3.

In the final analysis, the coefficients' significance depends on the direct, indirect and total effects. Therefore, only by the insignificance of one of these, these relations or constructs should not be removed. The moderating effect of conditional/unconditional accounting conservatism variables on the relation between current accounting information and equity values, and the relation between lagged accounting information and equity values, are insignificant at the 10% level.

FIGURE 3
The Final Model with the Effect of Moderating Variables



The R^2 and the adjusted R^2 of the model (3), i.e. the optimal model, is 0.75 and 0.74, respectively, which is significant at the 1% level. The f^2 of conditional conservatism on equity values, and the unconditional conservatism on market information, and lagged accounting information are insignificant on the equity value, but because of theoretical supports, these relations cannot be eliminated.

TABLE 7
GoF for the Optimal Proposed Model with Effects of Moderating Variables

		Standard value	statistics	Sig.	GoF
SRMR	Saturated model	Less than 0.8	0.10	0.00	good
	Estimated model		0.22	0.00	good
ULSD	Saturated model	Significant level	2.09	0.00	Sig.
	Estimated model		9.12	0.00	Sig.
GD	Saturated model	Significant level	1.36	0.00	Sig.
	Estimated model		1.66	0.00	Sig.
NFI	Saturated model	Less than and close to one	0.61	0.00	fairly good
	Estimated model		0.59	0.00	fairly good

As shown for both models cited in Table 7 the GoF results of the optimal model are as follows:

- The standardized root mean square residual (SRMR) values are less than 0.8.
- The unweighted least squares discrepancy (ULSD) and the geodesic discrepancy (GD) values are significant at the 1% level.
- The Bentler-Bonett index or normed fit index (NFI) is between zero and one.

6. DISCUSSION AND CONCLUSION

Researchers have developed models of how accounting policies affect the structure of residual in-come valuation models; the empirical supports of these models are often weak and contradictory, and these models often have deviations (Ashton and Wang, 2008). Conservative accounting policies are one of the drivers behind such deviations. Also, because of the lack of uniformity in the historical data, nonlinear models cannot be designed (Ashton and Wang, 2013, 2015). Accounting conservatism is reflected in the information dynamics (Feltham and Ohlson, 1995; Myers, 1999). Also, accounting conservatism causes delays in recognition of economic income. A method to examine this issue is to identify the effect of conservatism on the linear information dynamics. In this study, the linear dynamics of accounting information in equity value is modeled based on PLS-SEM with a formative approach using two criteria for conservatism, the M/B for unconditional conservatism, and C-score for conditional conservatism.

After modeling, the final model shows that (1) the moderating effect of the conditional and unconditional accounting conservatism on the relation between (current/lagged) accounting information and equity value at the 10% level is insignificant. Therefore, conditional and unconditional conservative accounting policies do not moderate the coefficient of (current/lagged) equity book value, current period earnings, abnormal earnings and dividends for equity valuation. (2) Conditional and unconditional conservatism has a significant relation at the 1% level with (current/lagged) accounting information, (current/lagged) market information, and equity value. (3) The (current/lagged) book value constitute the structure of the linear dynamics used in the residual income valuation model, which is consistent with the results of Pope and Wang (2005), Clubb (2013), and Ashton and Wang (2013). According to Ohlson (1995), an unbiased system refers to the expected long-term convergence between book value and market equity value; in the long run, this criterion is close to market values, but in the short term, book values without bias and market equity values may be different to the extent that the residual incomes are positive or negative. As a result, the residual income affects the behavior of book value and market equity value.

As the consistency rule in accounting does not allow change in procedures in different periods, long-term uniformity is assumed in accounting policies. On the other hand, conservative accounting

policies delay recognition of the increased economic wealth in the financial reporting system. In this regard, the results of the final model show that accounting policies significantly relate at the 1% level with stock market information and equity value, and current accounting information has a significant relation with market information and equity values, and the accounting information has a significant relation with (current/lagged) market information, but lagged accounting information is insignificantly related to equity value. This is consistent with the efficient market hypothesis because information is reflected in stock value after a while. Market information has a significant relation with equity values, because these changes in equity value at the end of the year or three months later results from a correlation between stock market information and equity value. Lastly, the results describe a model of information dynamics created by the financial reporting system on the stock value, and the information dynamics created by the reporting system are moderated by conservative accounting policies.

No significant restrictions curtailed collection of evidence. But in generalizing the results, care must be taken because the choice of different variables that represent different phenomena can change the results. Also, economic, political and epidemic conditions such as Covid-19 can have a positive or negative effect on the applications of this study.

For future research, the dynamics of accounting information, including linear and nonlinear dynamics, can be tested by stochastic differential equations. And modeling covariance-based structural equations with consideration of the dynamics of accounting variables in interaction with economic variables will be an interesting topic for future research.

ENDNOTES

1. This is equivalent to the assumption that dirty surplus items are reported in terms of fair value, where its net present value is zero.
2. These results are not reported in this paper.

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APPENDIX 1
Constructs and Indicators in the Research Model

Latent Constructs		Indicators	Symbol
Current accounting information & a lag-fiscal-year accounting information	AccInf & b.AccInf	Residual income per share	Ab.E
		Dividend per share	DPS
		Earnings per share	EPS
		Return on equity	ROE
		Equity book value	BV
		Operating per share	ce
		Dirty surplus per share	de
Current market information & A lag-fiscal-year market information	MarketInf & b.MarketInf	Firm's beta	Beta
		Forward Earnings Yield	EY
		Annually stock return	R
Equity value	Value	Annual stock price changes	Dp_t
		Stock price at the fiscal year end	P_t
		Stock prices three months after the fiscal year end	P_{t3}
Accounting policies	GScore	Accounting policies[a]	GScore
Conditional conservatism	Conditional	Conditional conservative accounting policies[a]	Cscore
Unconditional conservatism	Unconditional	Unconditional conservative accounting policies[b]	M/B

[a] the coefficient of good news release according to Khan and Watts (2009)
[b] the market value to book value according to Fama and French (1992, 1993, 1995)

APPENDIX 2

Computing the variables

Indicators		Description of the calculation
Residual income per share	Ab.E	The difference between operating income and expected income based on the firm's cost of capital
Dividend per share	DPS	Dividend per common stock
Earnings per share	EPS	Net earnings for the current period
Return on equity	ROE	Net earnings before unexpected items
Equity book value per share	BV	Total equity of the current period divided by the number of shares at the end of the fiscal year
Operating income per share	ce	Operating income divided by the number of shares at the end of the fiscal year
Dirty surplus items per share	de	Changes in book value (beginning and end of fiscal year) minus current operating income
Return on assets	ROA	Net earnings before extraordinary items divided by the book value of the company's assets
Firm size	Size	Logarithm of the firm market value
Leverage	Lev	Total debt divided by the firm market value
Total liabilities	TLiab	Sum of Long-term and short-term liabilities
inflation	Inflat	The average growth rate of consumer goods prices in the Iranian economy during the sample years
Firm's beta [a]	beta	Changes in firm's stock returns relative to changes in market returns
Forward Earnings Yield	EY	Net income before extraordinary items divided by lagged market equity value
Annual stock return	R	The company's annual returns after applying the effects of dividends, equity interests, new capital issue.
Annual stock price changes	Dp_t	Difference in the stock price at the end of current period relative to the last period
Stock price at the fiscal year end	P_t	Market value per share at the end of fiscal year

APPENDIX 2 *(continued)*

Indicators		Description of the calculation
Stock prices three months after the fiscal year-end	P_{t3}	The stock market price, three months after the end of the fiscal year.
Cost of capital	r	Firm's average cost of capital
Dividend growth	g	Changes in current dividend relative to last year's dividends
Book value to market value	B/M	Book value divided by market value
Conditional conservative accounting policies	Cscore	A measure of conditional conservatism based on Khan and Watts (2009), is calculated using panel data with cross-section fixed effects
Unconditional conservative accounting policies	M/B	Firm's market value to book value

[a] the firms' Beta: $\boldsymbol{\beta} = \frac{cov(R_{i,t}, R_{M,t})}{Var(R_{M,t})}$

Where, in period t for firm i, $R_{i,t}$ and $R_{M,t}$ are stock return and market return, respectively.