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8. This result is expected because of the differences in size and accounting practices among banking, industrial, insurance, and service sectors.
9. The author used the t -test to test $w_{11} + w_{12} = 0$,
$$t = (\beta_{11} + \beta_{12}) / \{\text{var}(\beta_{11}) + \text{var}(\beta_{12}) + 2\text{cov}(\beta_{11}, \beta_{12})\}^{1/2}.$$
10. Unreported results of regressing equation (1) after replacing cash flows from operations by accruals (calculated as net income before extraordinary items and discontinued operations minus cash flows from operation) show, as expected, mirror image results of Table 2. The coefficient estimates, w_{12} , are equals in value and reversal of sign for all industries and for pooled cross-sectional as well.
11. Barth et al. (1999) document similar results.
12. Dechow et al. (1996) develop the “bird in hand” argument that because cash flows are realized in the current period, while accruals represent future cash flows, the market’s valuation of accruals should impound discounts for futurity and risk.
13. Barth et al. (2001) and Barth et al. (1999) document variation on book value of equity coefficients across industries. They interpret this result by suggesting that accounting conservatism varies across industries.
14. A coefficient on the book values of equities being significantly different from 1, means there is a significant difference between market value of equity and book value of equity. It is assumed that the difference in values arises from goodwill that is unrecorded because of conservatism.
15. Unreported results of regressing equation (3) after replacing cash flows from operations by accruals (calculated as net income before extraordinary items and discontinued operations minus cash flows from operation) show, as expected, mirror image results of Table 4. The coefficient estimates, α_2 , are equal in value and reversal of sign for all industries and for pooled cross-sectional as well.
16. Barth et al. (1999) find that the two components of earnings, readily explain the market values of equities.
17. Barth et al. (1999) find similar results in the U.S.

banking, industrial, insurance, and service sectors. Finally the results suggest that accruals and cash flows explain the market values of equities.

6. Limitations of this Study

This study has limitations that may affect the generalizability of its results. The sample used in the study is small and covers a short period compared with those used in the U.S. Some companies are excluded because of missing data during the study period. In addition, the absence of prior literature in the Middle East region that examines the effect of earnings components in equity valuation, makes it difficult to compare the results

Endnotes

1. Earnings and its components are considered to be persistent if they are permanent in the future.
2. Clean surplus assumption requires that the book value of equity at the end of the period differs from the previous period's book value only by this period's earnings and dividends: $B_t = B_{t-1} + X_t - D_t$. This relation assumes that all items, besides dividends, which affect the book value of equity, must pass through the profit and loss statement. However, this relationship rarely holds since the statement of shareholders' equity contains a variety of other items.
3. Earnings is decomposed into permanent and transitory. Transitory is the part of earnings that are not expected to persist in the future.
4. Sloan (1996) also finds a negative association between the accrual component of current earnings and future stock returns. He concludes that stock prices act as if investors fail to correctly consider the lower persistence of the accruals portion of earnings when predicting future earnings, and such earnings prediction errors are corrected when lower (higher) than expected earnings are reported in future periods, resulting in predictable negative (positive) stock returns. Sloan argues that this result is consistent with fixation, by at least some market participants, on the total amount of reported earnings without regard for the relative magnitude of the accruals and cash flow components of earnings.
5. The companies that are traded on the Amman Stock Exchange are divided into four industries: banking, industrial, insurance, and service sectors.
6. Even though Dechow et al. (1999), Hand and Landsman (1999), and Barth et al. (1999) used 12% as a cost of capital, the study uses 7% because this is the percentage that gives a weighted average of zero abnormal earnings for all sample firms for the period 1998-2003. The author re-estimates the equations assuming different costs of capital and finds that the results are insensitive to the change in cost of capital.
7. The Durbin-Watson test does not reject the null hypothesis of zero autocorrelation. The *t*-tests in all Tables are White adjusted where the White χ^2 statistics rejects the homoscedasticity. Variance-Inflation Factor (VIF) tests indicate no impact of multicollinearity. Finally, in all regressions, the K-S test indicates the residuals are normally distributed with zero mean.

Table 5. Summary statistics from system of equations including market value of equity, abnormal earnings, and cash flows. Subsample of 466 firm-year observations from the Amman Stock Exchange, with X > 0 in any firm-years, 1998-2003.

$$X^a_{it} = w_{10} + w_{11}X^a_{it-1} + w_{12}CFO_{it-1} + w_{13}BV_{it-1} + \varepsilon_{1it} \quad (1)$$

$$CFO_{it} = w_{20} + w_{22}CFO_{it-1} + w_{23}BV_{it-1} + \varepsilon_{2it} \quad (2a)$$

$$MVE_{it} = i_0 + i_1BV_{it} + \alpha_1X^a_{it} + \alpha_2CFO_{it} + u_{it} \quad (3)$$

Industry	w_{11}		w_{12}		w_{22}		α_2		N
	coef	t-stat	coef	t-stat	coef	t-stat	coef	t-stat	
Bank companies	.950	5.35***	.049	1.89*	.772	8.12***	.303	1.87*	65
Industrial companies	.597	12.28***	.042	1.98**	.601	9.59***	.408	3.44***	200
Insurance companies	.346	2.42**	.129	9.32***	.697	12.4***	.243	2.02**	104
Service companies	1.02	9.98***	.072	2.01**	.689	9.56***	.481	2.59***	97
Pooled cross-sectional	.752	15.33***	.047	2.62***	.633	18.42***	.462	9.42***	466

Abnormal earnings per share, X^a, is net income before extraordinary items and discontinued operations per share, X, minus 0.07 * book value of equity per share, BV, lagged one year. Cash flows, CFO, are cash flows from operations per share. MVE is market value of equity per share at fiscal year end. * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level.

Note: The coefficients estimates, w₁₂ and α₂, are equal in value, but negative, and the regression results are the same when accruals rather than cash flows are used in the abnormal earnings and market value of equity equations because, by definition, net income equals cash flows plus accruals. See endnotes 10 and 15.

4.2.4. *Positive earnings sample*

Prior research finds that the Ohlson valuation model estimates differ for firms with positive and negative earnings (Barth et al., 1999). The findings presented in Tables 2 through 4 are based on all firm-years without regard to the sign of earnings (profits or losses). Therefore, and following Barth et al. (1999), the author re-estimates the accruals and cash flows systems, limiting the sample to firm-years with positive earnings. Table 5 presents these findings for cash flows.

Although the positive earnings samples comprise only 69.3% of the full sample, the findings presented in Table 5 are largely similar to those presented for the full sample. Table 5 shows that the persistence of abnormal earnings for cash flows, w_{11} , are close for both the full sample (presented in Table 2) and positive earnings subsample with mean estimated coefficients (pooled cross-sectional) 0.728 (0.752) for positive earnings subsample versus 0.618 (0.672) for full sample. The abnormal earnings forecasting coefficients on cash flows, w_{12} , are comparable to those based on the full sample. The results for the accruals are the same as those for cash flows, as explained on footnotes 7 and 12.

In sum, the findings presented in Table 5 suggests that inferences relating to the full sample are largely unaffected by negative earnings firms¹⁷.

5. CONCLUSIONS

This study extends the research on the ability of accruals and cash flow components of earnings to predict future abnormal earnings. It provides insight for applying Ohlson's model to international data and whether focusing on the U.S. findings can be generalized to other countries. The study extends the international accounting domain literature by using companies traded in the Amman Stock Exchange.

Prior international studies that use the Ohlson's model outside the U.S. are reviewed. The results of these studies are similar to those in the U.S., indicating that the results of this study can be generalized and compared to those in the U.S.

Results from the Amman Stock Exchange provide insights into the ability of accruals and cash flow components of earnings in forecasting future abnormal earnings. Firstly, the results show that accruals and cash flows are value-relevant in forecasting future abnormal earnings. This means that accruals and cash flows have an effect on determining the value of firms. In addition, accruals and cash flows have forecasting relevance since each has a significant relation to future abnormal earnings. There is considerable cross-industry variation in the magnitude of the estimated coefficients for components in the abnormal earnings forecasting equation. Secondly, the findings indicate that the autoregressive process of accruals and cash flows is stationary. This means that present accruals and cash flows can be used to predict future accruals and cash flows. In addition, accruals are less persistent than cash flows for all industries. These results mean that accruals is less permanent in the future compared with cash flows in

Table 4. Summary statistics from regressions of market value of equity on book value of equity, abnormal earnings and cash flows. Sample of 672 firm-year observations from the Amman Stock Exchange, 1998-2003.

$$MVE_{it} = i_0 + i_1 BV_{it} + \alpha_1 X_{it}^a + \alpha_2 CFO_{it} + u_{it} \quad (3)$$

Industry	i_1		α_1		α_2		$i_1=1$		$\alpha_1+\alpha_2=0$		N	Adj R ²	White χ^2
	coef	t-stat	coef	t-stat	coef	t-stat	t-stat	t-stat	t-stat				
Bank companies	.630	4.52***	3.86	6.47***	.361	2.07**	-2.64***	4.56***	78	.535	41.11***		
Industrial companies	.961	24.92***	1.64	4.96***	.408	3.44***	-1.00	2.89***	312	.724	153.8***		
Insurance companies	.747	3.53***	1.57	2.41**	.460	2.25**	-1.19	2.11**	120	.254	6.00		
Service companies	1.90	16.68***	2.44	5.67***	.478	2.62***	7.86***	3.37***	162	.759	43.74***		
Pooled cross-sectional	1.04	27.92***	2.38	10.15***	.422	8.76***	1.00	4.15***	672	.638	117.6***		

Abnormal earnings per share, X^a , is net income before extraordinary items and discontinued operations per share, X , minus 0.07 * book value of equity per share, BV , lagged one year. Cash flows, CFO , are cash flows from operations per share. MVE is market value of equity per share at fiscal year end. * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. The Durbin-Watson test does not reject the null hypothesis of zero autocorrelation. The t -tests are White adjusted where the White χ^2 statistics rejects the homoscedasticity. Variance-Inflation Factor (VIF) tests indicate no impacts of multicollinearity.

Note: The coefficient estimates, α_2 , are equal in value, but negative, and the regression results are the same when accruals are used in the market value of equity equation rather than cash flows because, by definition, net income equals cash flows plus accruals. See endnote 15.

Table 3. Summary statistics from first-order autoregressions of accruals and cash flows. Sample of 672 firm-year observations from the Amman Stock Exchange, 1998-2003.

Panel A: first-order autoregressions of accruals:										Panel B: first-order autoregressions of cash flows:									
$ACC_{it+1} = w_{20} + w_{22}ACC_{it} + w_{23}BV_{it} + \varepsilon_{2it+1}$ (2a)										$CFO_{it+1} = w_{20} + w_{22}CFO_{it} + w_{23}BV_{it} + \varepsilon_{2it+1}$ (2b)									
Industry	w_{22}			w_{23}			N	Adj R ²	White χ^2		w_{22}			w_{23}			N	Adj R ²	White χ^2
	coef	t-stat		coef	t-stat						coef	t-stat		coef	t-stat				
Bank companies	.440	4.01***		-.392	-1.81*		65	.071	8.45		.494	5.56***		.522	2.47**		65	.111	6.96
Industrial companies	.503	5.10***		.037	1.70*		260	.058	187.72***		.601	7.95***		.045	2.13**		260	.071	177.8***
Insurance companies	.623	10.9***		-.045	-.620		100	.055	2.3		.640	11.20***		.149	1.88*		100	.090	6.7
Service companies	.603	8.06***		-.011	-.293		135	.046	10.8*		.682	9.80***		.128	2.87***		135	.162	11.21**
Pooled cross-sectional	.676	26.6***		.001	.044		560	.072	210.6***		.720	33.65***		.069	3.02***		560	.106	209.4***

ACC is accruals per share calculated as net income before extraordinary items and discontinued operations per share minus cash flows from operations per share, BV is book value of equity per share, and CFO is cash flows from operations per share. * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. The Durbin-Watson test does not reject the null hypothesis of zero autocorrelation. The *t*-tests are White adjusted where the White χ^2 statistics rejects the homoscedasticity. Variance-Inflation Factor (VIF) tests indicate no impacts of multicollinearity.

4.2.2. Accruals and Cash Flows Autoregression Results

Table 3 presents regression summary statistics corresponding to the earnings component autoregression equations (2a) and (2b). The accruals autoregressions show that w_{22} is less than 1.00 for all industries, ranging from 0.440 for the banking sector to 0.623 for the insurance sector. w_{22} is positive, significant and less than 1.00 for pooled cross-sectional. This result indicates that stationary autoregressive processes exist for accruals. The cash flows autoregressions show that w_{22} ranges from 0.494 for the banking sector to 0.682 for the service sector. w_{22} is positive, significant and less than 1.00 for pooled cross-sectional. Since w_{22} is less than 1.00, the results show that, similar to accruals, the cash flows autoregressive process is generally stationary. For accruals, the estimated coefficient on lagged book value of equity, w_{23} , is positive but insignificant for pooled cross-sectional, indicating no correlation between lagged book value of equity and accruals. On the other hand, for cash flows, it is positive and significant for all industries as well as for pooled cross-sectional, indicating a positive correlation between lagged book value of equity and cash flows.

In sum, the results in Table 3 show that accruals and cash flows autoregressive processes are stationary. In addition, accruals are less persistent than cash flows for all industries and for pooled cross-sectional (the value of w_{22} is always in accruals lower than that in cash flows)¹². These results mean that accruals is less permanent in the future compared with cash flows in banking, industrial, insurance, and service sectors¹³.

4.2.3. Valuation equations

Table 4 presents regression results of the market values of equities on book value of equity, abnormal earnings, and cash flows corresponding to valuation equation (3) that test the third hypothesis which examines whether accruals and cash flows can help in explaining the market values of equities, in a valuation model that includes book value of equity and abnormal earnings. As shown in Table 4, α_2 , the estimated coefficient of cash flows, is positive and significantly different from zero for all industries and for pooled cross-sectional as well. This indicates that cash flows are value-relevant for explaining the market values of equities. Also, the study rejects the null hypothesis that $\alpha_1 + \alpha_2 = 0$ for every industry, indicating that cash flows are value-relevant for each industry (i.e., their total estimated coefficient in each industry differs from zero).

Substantial cross-industry variation in the estimated coefficients on book value of equity and abnormal earnings is also shown in Table 4. The study rejects the null hypothesis that the estimated coefficient of the book values of equities equals one in banking and service sectors¹⁴. These findings suggest that the extent of accounting conservatism varies across industries. The estimated coefficient for abnormal earnings, α_1 , is positive and significant in all industries. The results for accruals are similar as those for cash flows¹⁵.

In sum, as shown in Table 4, the results of the third hypothesis are supported. The results suggest that accruals and cash flows explain the market values of equities¹⁶.

Table 2. Summary statistics from regressions of abnormal earnings on lagged abnormal earnings, cash flows and book value of equity. Sample of 672 firm-year observations from the Amman Stock Exchange, 1998-2003.

$$X^a_{it+1} = W_{10} + W_{11}X^a_{it} + W_{12}CFO_{it} + W_{13}BV_{it} + \varepsilon_{it+1} \quad (1)$$

Industry	W ₁₁		W ₁₂		W ₁₃		W ₁₁ + W ₁₂ = 0		N	Adj R ²	White χ^2
	coef	t-stat	coef	t-stat	coef	t-stat	t-stat	t-stat			
Bank companies	.654	5.20***	.059	2.096**	.004	.896		3.765***	65	.299	7.6
Industrial companies	.597	12.28***	.040	1.982**	-.004	-.727		4.200***	260	.403	120.4***
Insurance companies	.342	3.34***	.086	2.500**	-.006	-1.58		2.082**	100	.144	16.6*
Service companies	.878	13.47***	.077	2.121**	.001	.048		6.781***	135	.631	27.3***
Pooled cross-sectional	.672	19.76***	.052	2.863***	-.006	-1.10		9.185***	560	.448	173.1***

Abnormal earnings per share, X^a , is net income before extraordinary items and discontinued operations per share, X , minus 0.07 * book value of equity per share, BV , lagged one year. Cash flows, CFO , are cash flows from operations per share. * = significant at 10% level, ** = significant at 5% level, *** = significant at 1% level. The Durbin-Watson test does not reject the null hypothesis of zero autocorrelation. The t -tests are White adjusted where the White χ^2 statistics rejects the homoscedasticity. Variance-Inflation Factor (VIF) tests indicate no impacts of multicollinearity.

Note: The coefficient estimates, w_{12} , are equal in value, but negative, and the regression results are the same when accruals are used in the abnormal earnings equation rather than cash flows because, by definition, net income equals cash flows plus accruals. See endnote 10.

4.2. Regression Results

4.2.1. Abnormal Earnings Equations

Table 2 presents regression results corresponding to the abnormal earnings equation (1) for each of the four industries⁷. Pooled cross-sectional coefficient estimates and *t*-statistics values are summarized at the bottom of Table 2 and in all subsequent tables in which industry-specific results are presented.

The results in Table 2 reveal that w_{12} is positive and significant for all industries and for pooled cross-sectional as well. These results suggest that the proportion of current earnings attributable to cash flows does affect the future abnormal earnings. Table 2 also reveals that w_{12} varies across industries⁸. The coefficient estimates (*t*-statistics) range from 0.040 to 0.086. The industry with the most extreme positive coefficient estimate is the insurance sector, suggesting that dividing earnings into its components, to predict abnormal earnings, is more value-relevant in this industry than that in other industries. In addition, forecasting irrelevance of cash flows for all industries and for pooled cross-sectional is rejected (i.e., $w_{11} + w_{12} \neq 0$)⁹.

Consistent with prior research (Dechow et al. (1999); Hand and Landsman (1999); and Barth et al. (1999)), the coefficient estimate on lagged abnormal earnings, w_{11} , is positive and highly significant for all industries as well as for a pooled cross-sectional analysis. The mean of the estimated coefficients across the four industries is 0.618 (untabulated). In addition, the estimated coefficients range from 0.342 to 0.878 indicating cross-industry variation in the persistence of abnormal earnings. Finally, the estimated coefficient on lagged equity book value, w_{13} , is insignificant for all industries, which indicates a potential cost of capital equal to 7%.

By definition, net income equals cash flows plus accruals. Thus, we may expect that the findings relating to accruals are “mirror images” of the findings relating to cash flows. For example, if w_{12} is significantly positive for cash flows, it is expected to be significantly negative for accruals¹⁰.

In summary, the results indicate that cash flows and accruals tend to have the ability to predict future abnormal earnings¹¹.

Table 1. Descriptive statistics for the sample of 672 firm-year observations from the Amman Stock Exchange Market, 1998-2003.

Panel A: Distributional statistics (in Jordanian Dinars)

Description	Variable	Mean	Median	Std dev
Market value of equity	MVE	1.73	1.20	1.75
Book value of equity	BV	1.53	1.27	1.16
Market-to-book ratio	MB	1.06	0.92	0.63
Abnormal earnings	X ^a	0.00	-0.02	0.19
Accruals	ACC	-0.14	-0.07	0.59
Cash flows	CFO	0.24	0.13	0.61
Net income	X	0.10	0.07	0.23

Panel B: Pearson (Spearman) correlations above (below) the diagonal

Variable	MVE	BV	X ^a	ACC	CFO
MVE		0.764	0.468	0.133	0.118
BV	0.759		0.325	0.102	0.135
X ^a	0.474	0.406		0.092	0.264
ACC	0.017	-0.038	0.177		-0.928
CFO	0.378	0.425	0.409	-0.723	

Panel C: Industry composition

Industry	# Companies	# firm years	% of obs.
1 Bank Companies	13	78	11.6
2 Industrial Companies	52	312	46.4
3 Insurance Companies	20	120	17.9
4 Service Companies	27	162	24.1
Total	112	672	100.0

Abnormal earnings per share, X^a, is net income before extraordinary items and discontinued operations per share, X, minus 0.07 * book value of equity per share, BV, lagged one year. Accruals per share, ACC, is X minus cash flows from operations per share, CFO. MVE is market value of equity per share at fiscal year end. MB is market-to-book ratio. The par value per share for all firm-year observations is one Jordanian Dinar.

where *MVE* is the market value of equity and all other variables are as defined previously. Again, because net income equals accruals plus cash flows, one may expect that the findings relating to cash flows in equation (3) are “mirror images” of the findings relating to accruals. For example, if α_2 is significantly positive for cash flows, it is expected to be significantly negative for accruals.

Equation (3) is used to test hypothesis H_3 . It is the valuation equation based on the information dynamics suggested in the first three equations in Ohlson's model, with α_2 as the valuation multiple on cash flows. Analogous to the interpretation of w_{12} in equation (1), α_2 reflects the incremental effect of cash flows on valuation.

Finding that α_2 , the estimated coefficient of cash flows, in equation (3) is significantly different from zero, indicates that cash flows are incrementally value-relevant and help in explaining equity value.

4. EMPIRICAL RESULTS

4.1 Data and Univariate Analyses

The sample used in this study for the period 1998-2003 includes 112 companies traded on the Amman Stock Exchange⁵ (which represents about 58% of all publicly traded firms in Jordan). Other companies are excluded because of missing data during the study period. Prior to 1998, the number of firms that reported the required information is small. The sample is restricted to firms with complete useful data. All variables are measured per share at fiscal year-end, including the market value of equity and expressed in Jordanian Dinars.

Table 1 presents descriptive statistics for each of the variables used in the estimated equations. Panel A of Table 1 reports distributional statistics, panel B contains Pearson and Spearman correlations, and panel C describes the industry composition of the sample. Panel A reveals that, on average, the market value of equity exceeds the book value of equity. Consistent with prior research (Sloan (1996); Barth et al. (2001); and Barth et al. (1999)), panel A of Table 1 shows that, on average, accruals are negative, and cash flows are positive. Panel A also demonstrates that the mean abnormal earnings is zero, which could be attributable to the cost of capital being equal to 7% in Jordan⁶. Panel B, of Table 1, shows that most of the variables are highly correlated with each other. Abnormal earnings is positively correlated with cash flows and accruals. Panel C, of Table 1, reports the breakdown of companies and firm years by industry. Industrial Companies (46.4%) is the industry with the largest concentration of firm-year observations.

tive. Note that the total estimated coefficient for cash flows equals $w_{11} + w_{12}$. Thus, if $w_{11} + w_{12} = 0$, then cash flows are irrelevant for forecasting abnormal earnings. Ohlson labels this condition abnormal earnings “forecasting irrelevancy.” Conversely, if $w_{11} + w_{12} \neq 0$, then cash flows have abnormal earnings “forecasting relevance.” Because it is not expected that cash flows are entirely transitory, this study predicts that cash flows have forecasting relevance. Thus, the study expects that $w_{11} + w_{12} \neq 0$.

3.2. *The Autoregressive Process of Accruals and Cash Flows*

Ohlson (1999) labeled the autocorrelation, or persistence, of each earnings component as “predictability.” Transitory earnings can be characterized as a process in which future accruals (cash flows) do not depend on the present or past accruals (cash flows). For earnings components that are not entirely transitory, the higher the persistence, the more predictable is the component. Because the study expects that accruals and cash flows would be positively autocorrelated, it predicts that accruals and cash flows each are persistent. This leads to the second hypothesis presented in an alternative form:

H₂ : The autoregressive process of accruals and cash flows is stationary.

To test this hypothesis, the study uses the following equations:

$$ACC_{it+1} = w_{20} + w_{22}ACC_{it} + w_{23}BV_{it} + \varepsilon_{2it+1} \quad (2a)$$

$$CFO_{it+1} = w_{20} + w_{22}CFO_{it} + w_{23}BV_{it} + \varepsilon_{2it+1} \quad (2b)$$

Where ACC , accruals per share, = $X - CFO$. All other variables are as defined previously. A value less than 1 for w_{22} indicates a stationary autoregressive process for accruals and/or cash flows. In addition, because accruals are expected to be less persistent than cash flows, w_{22} in equation (2a) is expected to be smaller than that in equation (2b).

3.3. *The Ability of Accruals and Cash Flows to Explain the Market Value of Equity*

The study expects that accruals and cash flows each have the ability to explain the market value of equity. This leads to the third hypothesis presented in an alternative form:

H₃: Accruals or cash flows provide incremental information for explaining the market value of equity.

This hypothesis is examined by estimating the relationship between market values of equities and book values of equities, abnormal earnings, and accruals or cash flow components of earnings.

$$MVE_{it} = i_0 + i_1 BV_{it} + \alpha_1 X^a_{it} + \alpha_2 CFO_{it} + u_{it} \quad (3)$$

W_{23} = persistence of lagged book value of equity over accruals or cash flows,

W_{33} = persistence of book value of equity,

α_1 = incremental effect of abnormal earnings on the market value of equity,
and

α_2 = incremental effect of accruals or cash flows on the market value of equity

Thus, based on equation (i), the hypothesis for predicting future abnormal earnings can be stated in alternative forms as follows:

H₁: Accruals or cash flows are value-relevant in predicting future abnormal earnings.

H₁ is tested empirically using equation (1):

$$X_{it+1}^a = w_{10} + w_{11}X_{it}^a + w_{12}CFO_{it} + w_{13}BV_{it} + \varepsilon_{1it+1} \quad (1)$$

where,

X_t^a = abnormal earnings per share = $X_t - r BV_{t-1}$,

X = income before extraordinary items and discontinued operations per share,

r = cost of capital,

BV = book value of equity per share, and

CFO = cash flows from operations per share.

Although this definition of X violates the clean surplus assumption (Ohlson, 1995), it eliminates potential confounding effects of large one-time items and is consistent with prior research (e.g., Dechow et al. (1999)). Furthermore, Hand and Landsman (1999) suggest that violating clean surplus should have little effect on the findings.

By definition, net income equals accruals plus cash flows. Thus, one may expect that the findings relating to cash flows in equation (1) are “mirror images” of the findings relating to accruals. For example, if w_{12} is significantly positive for cash flows, it is expected to be significantly negative for accruals.

This study addresses H₁ by estimating the relation between future abnormal earnings and current abnormal earnings, current cash flows, and current book value of equity (see Barth et al. (1999)). A significant coefficient for cash flows in equations (1) may indicate that a component is incrementally informative in predicting abnormal earnings.

In equation (1), w_{11} reflects the persistence of abnormal earnings. Prior research (e.g., Dechow et al. (1999) and Hand and Landsman (1999)) predict that w_{11} is posi-

in the U.S. with some exceptions. Even though there are differences between the data from Jordan and the data from the U.S., the author does not expect major differences in the ability of accruals and cash flows to predict the future value of equity because it is expected that the value of a firm will be affected by its earnings, cash flows, dividends, and abnormal earnings everywhere in the world in spite of differences between countries.

3. RESEARCH METHODOLOGY AND HYPOTHESES

3.1. *The Role of Accruals and Cash Flows in Predicting Future Abnormal Earnings*

Barth et al. (1999) provide insights into the characteristics of accruals and cash flow components of earnings that affect their relationship to a firm's value. To achieve their objective, the authors utilize the framework in Ohlson (1999), which extends Ohlson (1995) by modeling earnings components. The modeling extension suggests that the value-relevance of an earnings component, depends on its ability to predict abnormal earnings incremental to abnormal earnings and on the persistence of the component. The model is comprised of four equations:

$$X^a_{t+1} = w_{11}X^a_t + w_{12}X_{2t} + w_{13}Bv_t + \varepsilon_{1t+1} \quad (\text{i})$$

$$X_{2t+1} = w_{22}X_{2t} + w_{23}Bv_t + \varepsilon_{2t+1} \quad (\text{ii})$$

$$Bv_{t+1} = w_{33}Bv_t + \varepsilon_{3t+1} \quad (\text{iii})$$

$$MVE_t = Bv_t + \alpha_1 X^a_t + \alpha_2 X_{2t} + u_t \quad (\text{iv})$$

where,

X^a = abnormal earnings per share, defined as $X_t - rBv_{t-1}$,

X_t = income before extraordinary items and discontinued operations per share,

r = cost of capital,

X_2 = either accruals per share or cash flows from operations per share,

Bv = book value of equity per share,

MVE = market value of equity per share,

W_{11} = persistence of abnormal earnings,

W_{12} = incremental effect of accruals or cash flows on abnormal earnings,

W_{13} = the lagged book value of equity on abnormal earnings,

W_{22} = the lagged coefficient of accruals or cash flows,

cern is with errors in the tails of the equity value prediction error distribution, then earnings should be disaggregated into cash flows and the major accrual components, otherwise, earnings should be disaggregated only into cash flows and total accruals. Karathanassis and Spilioti (2005) examine the empirical validity of Ohlson's and Feltham and Ohlson's models for the Greek equity market. The study finds that these models appear to be reliable price valuation models.

2.2. Literature Review in the Middle East

The ability of accruals and cash flows to predict future abnormal earnings has not been tested yet in the Middle East region. Different researchers study the relationship between cash flows, stock returns, earnings, and/or future earnings. Khalayleh (1997) examines the relationship between cash flows and stock returns in the long-run. He assumes that the relationship is stronger in the long-run. The author uses data from Amman Stock Exchange between 1985 – 1994. The result indicates that the relationship between cash flows and stock returns is low. Karasneh (2002) tests the ability of earnings and cash flows to predict future earnings, using the Random Walk Model. Results using data from the Amman Stock Exchange, indicate that accounting net income has a higher ability than cash flows to predict future earnings. Yousof (1997) examines the ability of cash flows and accounting income to predict future cash flows and future earnings. Using data from Egypt during 1993 – 1994, the results indicate that cash flows are better predictors for future cash flows and future earnings than accounting income.

Alawneh and Bsool (2004) compare between the information content of net cash flows from operations and the information content of net accounting income. Using data from Masqat Stock Exchange, the result indicates that net cash flows from operations has higher information content than net accounting income. Alwabel (1996) examines and analyzes statement of cash flows, its role in future prediction, and its importance in investment decisions and stock prices. The study also compares the information content in cash flows and the information content in accruals. Data from Saudi Arabia shows that statements of cash flows have information content. This information is easy and objective and is higher in cash flows than in accruals. Alfadel (1999) studies the importance of cash flow information in external financial reports. Using data from Iraq between 1994 – 1996, the result indicates that cash flows disclosures provide financial reports with information about the efficiency of financial policy in the firm.

In summary, the Ohlson's model has been used in international accounting literature. The findings of these international studies are comparable to those in the U.S. even though there are significant differences in the business environment between various countries. This is related to differences in measurement, disclosures practice, culture, and social values. For example, German accounting has long been considered conservative. Accounting in the United Kingdom, on the other hand, is thought to be less conservative.

The results of this paper are expected to be complementary and similar to those

future dividends. Secondly, the clean surplus relation assumption is held. Thirdly, abnormal earnings for the next period equals abnormal earnings this period plus transitory earnings this period.

Barth et al. (1999) provide insights into the characteristics of the accruals and cash flows components of earnings that affect their relationship to a firm's value. To achieve their objective, the authors utilize the framework in Ohlson (1999), which extends Ohlson (1995), by modeling the earnings components. The extension suggests that the value relevance of an earnings component depends on its ability to predict abnormal earnings, incremental to abnormal earnings and the persistence of the component. The authors expect accruals and cash flows to have different abnormal earnings forecasting ability. They find that the relationship is negative and positive for accruals and cash flows, respectively, indicating that abnormal earnings is less persistent when accruals comprise a large proportion of current earnings. The authors find that for all industries, accruals and cash flows each have significant incremental explanatory power to forecast future abnormal earnings, in valuation models that also includes book value of equity and abnormal earnings.

Sloan (1996) finds that the persistence of current earnings performance is increasing in the cash flows component of earnings and decreasing in the accruals component of earnings⁴. Furthermore, Sloan (1996) shows that cash flows are more persistent than accruals for future earnings.

Bartov et al. (2001) investigate whether earnings or cash flows provide greater information for equity valuation within the U.S., the U.K., Canada, Germany, and Japan. The authors generalize the findings of prior U.S. research by showing that earnings are more important than cash flows for equity valuation in other Anglo-Saxon countries. In the two non-Anglo-Saxon countries where capital is traditionally raised from private sources, earnings are generally not superior to cash flows for equity valuations. The findings demonstrate that the superiority of earnings over cash flows is not universal. Rather, it depends on the national reporting regime and attendant institutional factors.

Nikkinen and Sahlstrom (2004) investigate the impact of an accounting environment on the performance of cash flow prediction models. The results suggest that the model used by Barth et al. (2001) performs consistently internationally. The impacts of the explanatory variables are similar in countries with a high quality of accruals and different in countries with a low quality of accruals. The results imply that the cash flow prediction model by Barth et al. (2001) can be used in different kinds of accounting environments.

Barth et al. (2005) use equity value estimates to determine whether earnings disaggregation helps in predicting contemporaneous equity values. The authors consider three levels of earnings disaggregation: aggregate earnings, cash flows and total accruals and cash flows and four major components of accruals. Findings suggest that if con-

presents the empirical results. Section 5 summarizes and concludes the study. Finally, section 6 explains the limitations of the study.

2. LITERATURE REVIEW

2.1 Literature Review in the U.S. and Europe

Classification studies have categorized accounting systems in different countries on criteria such as business environment (Mueller, 1968), measurement and disclosure practice (Nair and Frank, 1980), and culture and social values (Hofstede, 1980; Gray, 1988; and Perera, 1989). For example, German accounting has long been considered conservative and focused more on tax and lender concerns than on information for investors (Samuels et al., 1994, Ch. 4). Accounting in the United Kingdom, on the other hand, is thought to be less conservative, focused primarily on equity investors, and more concerned with reflecting market values (Samuels et al., 1994, Ch. 4). The two countries also differ in the extent to which they adhere to clean surplus². U.K. accounting has greater violations of clean surplus accounting. Thus, different countries exhibit considerable diversity in accounting practices.

Previous studies suggest that the relationship between cash flows, accruals, abnormal earnings, book value of equity and market value of equity are expected to differ between countries due to unique socio-economic environments that result in differences in financial reporting and determination of stock prices. The important research question is how to apply the Ohlson's model using data from the Amman Stock Exchange and whether the findings can be generalized and compared to those in the U.S.

Numerous studies review and synthesize modern finance valuation theory and the ways it relates to the valuation of firms and accounting data. A number of articles (Beaver et al. (1980); Beaver et al. (1987); Collins et al. (1987); Collins, and Kothari (1988); Daley (1984); Easton (1985); Easton and Zmijewski (1987); Komendi and Lipe (1987); Lipe (1985); and Ryan (1986)) considered formal security valuation models prior to the time that testing empirical hypotheses became common practice.

Ohlson (1995) develops and analyzes a model of a firm's market value related to contemporaneous and future earnings, book value, and dividends. It contributes to the accounting literature by providing a benchmark model that can be used to conceptualize how value relates to the three accounting variables, earnings, book value, and dividends.

Ohlson (1999) develops a concept of transitory earnings³ and contrasts this source of earnings to core earnings. He analyzes how this source of earnings differs from other income items. The modeling follows Ohlson (1995) but with an extension to permit two earnings components: core earnings and transitory earnings. Three assumptions specify the class of models of interest. Firstly, the price equals the present value of

nificant explanatory power in forecasting future abnormal earnings incremental to abnormal earnings. In particular, they find that the relation is negative and positive for accruals and cash flows, respectively, indicating that abnormal earnings are less persistent when accruals comprise a larger proportion of current earnings.

This study extends the research on the ability of accruals and cash flows components of earnings to predict future abnormal earnings, which helps in equity valuations. Firstly, this study provides an insight into the characteristics of the accruals and cash flows components of earnings, that affect their relation to a firm's value. Secondly, by identifying the role of information in the accruals and cash flows components of earnings in predicting future abnormal earnings, this study provides a natural setting in which to corroborate and extend prior evidence. Thirdly, following Barth et al. (1999), the study utilizes the framework suggested by Ohlson (1999), which extends Ohlson's (1995) valuation model by modeling earnings components. And finally, conventional wisdom suggests that the relationships between cash flows, accruals, abnormal earnings, book value of equity, and market value of equity are expected to differ between countries, due to unique socio-economic environments that result in differences in financial reporting and determination of stock prices. This study provides insight into how to apply Ohlson's model using international data and whether the findings can be generalized to countries other than the U.S. The international perspective is important because each country designs its own rules for earnings recognition and sets bounds on management's discretion in determining earnings.

Applying Ohlson's model using international data from the Middle East (Amman Stock Exchange) is considered an important contribution to literature because this has never been done yet. Data from the Amman Stock Exchange is different from that in the U.S. Firstly, the data used in the U.S. excludes banking, insurance, and utilities because these industries are affected by government regulations. This study does not exclude any industry because all industries in Jordan are affected by government regulations. In addition, the U.S. studies use larger samples and cover longer periods. Secondly, the GAAPs in Jordan are affected by tax regulations. Examples are: the firm is allowed to choose the depreciation method that helps in accomplishing its objectives, the tax rate differs across industries, and there is additional income tax on dividends. Thirdly, the institutional environments in Jordan differ from those in the U.S. in several important ways. For example, culture, religion, income, and behavior are different. And finally, the standard setting bodies in Jordan are influenced and controlled by government. Because of that, the cost of capital in Jordan, for example, is lower than that in the U.S. Another contribution is that this study is considered, according to my knowledge, the first in the Middle East region that examines the ability of earnings components in equity valuation. Different studies test the relation between cash flows, stock returns, earnings, and/or future earnings.

The remainder of the paper is organized as follows: section 2 introduces the literature review. Section 3 describes the research methodology and hypotheses. Section 4

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The Ability of Accruals and Cash Flows to Predict Future Abnormal Earnings Evidence from Amman Stock Exchange

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Abstract:

This paper extends the research on the ability of accruals and cash flow components of earnings, to predict future abnormal earnings, which helps in equity valuations. Results from the Amman Stock Exchange provide insights into the ability of accruals and cash flows components of earnings in forecasting future abnormal earnings. First, the results show that accruals and cash flows are value-relevant in forecasting future abnormal earnings. In addition, accruals and cash flows have forecasting relevance since each has a significant relationship to future abnormal earnings. There is considerable cross-industry variation in the magnitude of the estimated coefficients for components in the abnormal earnings forecasting equation. Second, the findings indicate that the autoregressive process of accruals and cash flows is stationary. In addition, accruals are less persistent than cash flows for all industries. These results mean that accruals are less permanent in the future, compared with cash flows in banks, industrial, insurance, and services companies. Finally the results suggest that accruals and cash flows explain the market values of equities.

1. INTRODUCTION

Recent research investigates the role of earnings, cash flows, and accruals in predicting abnormal earnings. Barth et al. (2001), for example, find that earnings, which are cash flows from operations plus accruals, are better indicators of future earnings than current and past cash flows. Barth et al. (1999), on the other hand, test the framework of Ohlson's (1999) model, which extends Ohlson (1995) by modeling earnings components. They suggest that the value-relevance of an earnings component depends on its ability to predict abnormal earnings, incremental to abnormal earnings and on the persistence of the component¹. The authors find that accruals and cash flows each have sig-