TOPIC: THE VALUE-RELEVANCE OF CHANGES IN LEVERAGE: EVIDENCE FROM HONG KONG LISTED COMPANIES

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Value Relevance of Changes in Leverage: Evidence from Hong Kong Listed Companies

Abstract

The main objective of this study is to examine the value relevance of the change in leverage. Our findings suggest a strong negative relationship between the change in leverage and contemporaneous earnings. The value relevance of different items on the financial statement has been studied by scholars. Traditionally, accounting earnings have been considered as value relevant (Ball and Brown, 1968). However, due to changes in the commercial world, such as advancement in technology and the changes in accounting standards, earnings has been lose its influence in its value relevance. Thus, we would like to explore how the change in leverage can affect equity returns in the Hong Kong stock market. We use the data from Hong Kong stock market from 2007 to 2012 and confirm that the change in leverage can be one of the value relevant indicators in analysing the contemporaneous equity returns and future accounting earnings as they are proved to be negatively correlated. Our study proposes that the change in leverage can be used as a supplementary factor in analysing the stock returns and economic performance of a firm as common performance measures may not fully accommodate all relevant information.

Keywords: value relevance, change in leverage, stock returns, accounting earnings
Section 1: Introduction

This paper aims at examining whether the change in leverage is a value relevant indicator. An item on the financial statement is considered as value relevant if it is correlated with equity returns (Barth, 2000). The significance of traditional value relevant measures such as earnings diminishes because of development of new industries and changing accounting standards. Afterwards, the change of leverage has been proposed to be one of the value relevant indicators by Dimitrov and Jain (2008).

According to the theory by Myers (1984), the capital structure of companies always stays at optimal level. Change in leverage occurs when firms need more money due to various reasons, for example financing new projects, maintaining liquidity position or repaying loans etc. The change in leverage serves a signal to investors who will make investing decision with regards to this information. Therefore, the change in leverage is value relevant because it will affect the decision of investors (Dimitrov and Jain, 2008). There are limited articles discussing the value relevance of the change in leverage. We follow the work of Dimitrov and Jain (2008), and test whether change in leverage is a value relevant indicator in the Hong Kong stock market, which has not been investigated in similar aspect before. We have found a significant negative relationship between the change in leverage and contemporaneous equity earnings.

Our paper will be divided into five sections. Related literature will be discussed in Section 2. Next, the data sources and the variables will be described in Section 3. The construction of the regression analysis and the outcome will be discussed in Section 4. Finally, we will conclude the findings in Section 5.
Section 2: Literature Review

In this section, firstly, related articles about the concept of value relevance will be discussed. Then, studies about alternative value relevant indicators will be mentioned. After that, we will look at the empirical researches about the relationship between leverage and equity returns. As our model will also examine the effect of the growth in assets on stock returns, studies about the growth in assets will be discussed.

The Concept of Value Relevance

An item is deemed to be value relevant if it is significantly correlated with the market value of the stock (Barth, Kasznik, McNichols and Maureen, 2001). Thus, accounting information is served as equity valuation (Holthausen and Watts, 2001). According to the statement of Financial Accounting Concepts No.8 issued by Financial Accounting Standards Board of the Financial Accounting Foundation (2010), the main purpose of financial reporting is to inform users about an entity's financial status and assist management in making economic decision. However, the value relevance concept we are discussing interprets financial information from a different perspective. Researchers have been interested in finding out how the accounting information affects investors’ behaviour (Holthausen and Watts, 2001). Ball and Brown (1968) have mentioned accountants and the users of accounting data concern with the information value of annual earnings reports. Value relevance is a mean to evaluate to what extent a particular accounting amount can show the information used by the investors. The investors carry out assessment on such accounting amount and their investing behaviour is reflected on the stock price (Ball and Brown, 1968). In other words, the value relevance approach attempts to investigate the ability of an accounting amount in reflecting “investors’ consensus beliefs”, rather than the true underlying value of the company (Barth, Beaver and Landsman, 2001).

Development of Value Relevant Indicators

Prior researches mainly focus on the value relevance of accounting earnings (Ball and Brown, 1968; Collins, Maydew and Weiss, 1997; Giner and Reverte, 1999; Brown and Sivakumar, 2003). However, with changes occurring in the market, earnings are not
sufficient enough to explain investing behaviour. Rise of new industries and changes in accounting standards make earnings become less significant in signalling the economic performance of a firm. Particularly, the occurrence of “one-time items”, “negative earnings” and “the growth in intangibles assets” has affected the value relevance of earnings. (Collins and Salatka, 1993; Collins, Kothari, Shanken and Sloan, 1994; Hayn, 1995; Elliot and Hanna, 1996; Basu, 1997; Collins et al. 1997) The accounting scandal of WorldCom reveals a defect in earnings measurement (Watts, 2003). Management has the incentives to inflate earnings so as to get more compensation and meet the earnings target in order to satisfy equity investors (Dechow, Ge and Schrand, 2010).

Since earnings are not satisfactory performance indicator, a large body of research is developed to investigate alternative value relevant measures. In the Statement of Financial Accounting Concepts No.8, para BC 1.32 (2010), it states, “The Board concluded that to designate one type of information (such as earnings) as the primary focus of financial reporting would be inappropriate.” With this guideline, more researches focus on developing alternative value relevant measures.

Livnat and Zarowin (1990) have examined cash flow and found that operating and financing cash flow are value relevant. The analysis done by Cheng, Liu and Schaefer (1996) has suggested that operating cash flow is more value relevant than earnings. Pfeiffer, Elgers, Lo and Rees (1998) have proved that operating cash flow can better explain stock returns than accruals.

Some researchers have been interested in finding out the value relevance of particular item for developing industries. For example, Lev and Sougiannis (1996) have examined the value relevance of R&D in the high technological industry. Another industry study made by Amir and Lev (1996) has proved that non-financial indicators such as market share can be more value relevant than financial indicators in the wireless communication industry.

While some researchers have looked at the usefulness of alternative financial indicators like dirty surplus (Lin, 2006) and accumulated depreciation (Kang and Zhao, 2010), others have
examined the value of relevance of non-financial indicators, for instances, intangibles (Aboody and Lev, 1998; Daniel and Titman, 2006), patent (Hirschey, Richardson and Scholz, 2001) and corporate social responsibility (Konar and Cohen, 2001; Hassel, Nilson and Nyquist, 2005; Johnston, Sefcik and Soderstrom, 2008). Articles are also developed in assessing how countries and industrial factors affect the degree of value relevance of the financial data as a whole (Ali and Hwang, 1999).

The Importance of the Change in Leverage
The significance of financial leverage information is according to theoretical models of Myers (1984), Myers and Majluf (1984), and Miller and Rock (1985). It is based on a belief that the financial leverage will remain the same during the year at optimal level. When managers realize more cash is needed because of unanticipated deteriorating economic performance, they will choose to issue either debts or equity. Due to lower agency cost in issuing debts, the managers will prefer issuing debt to issuing external equity. Moreover, the decision of issuing equity is not likely driven by current performance, but availability of good investing opportunities (Jung, Kim and Stulz, 1996). Therefore, Dimitrov and Jain (2008) have suggested that the change in leverage may be a possible indicator of worsening performance in the current period.

Prior Empirical Studies Regarding Leverage and Stock Returns
A number of empirical researches document a negative relationship between the level of leverage and stock price. (Nissim and Penman, 2003; Penman, Richardson and Tuna, 2007; Muradoglu and Sivaprasad 2008; Dimitrov and Jain, 2008; George and Huang, 2010). Although some of the literature produces opposite results. (Hamada, 1972; Bhandari, 1988; Dhaliwal, Heitzman and Zhen, 2006), it is possible that the inclusion of highly regulated companies, for example, utilities and financial institutions leading to such result. (Penman, Richardson and Tuna, 2007)

To our best knowledge, the literature directly related to the change in leverage is limited (Dimitrov and Jain, 2008; Artikis and Nifora, 2011). Yet, most of the literature discussed
below gives us valuable evidence of the reaction of stock price against the change in leverage or the level of leverage.

Research done by Dimitrov and Jain (2008) is directly related to our study. They have evidenced a significant negative association between the change in leverage and the current stock returns. The effect of the change in leverage on future accounting performance and future equity returns has been examined. The result shows that the change in leverage is as value relevant as accounting earnings and cash flow. Besides, the study also has found out that growth in assets is a value relevant indicator.

Cai and Zhang (2011) have observed that the change in leverage ratio affect negatively on the and stock price in the United States’ stock market. It is suggested that the change in leverage gives a signal to the market participants concerning the value of the stock. The evidence is that stock price in the current and the next quarter is influenced by the change in leverage in the current period. The effect on price diminishes in the remaining quarters within the year as the market absorbs the information promptly. However, based on our findings, the effect of the change in leverage on stock price has lasted for at least 12 months.

Caskey, Hughes and Liu (2012) have investigated the effect of leverage from a different perspective. Similar to our argument, it is based on an assumption that companies maintain an optimal leverage level. Yet, the leverage level is vulnerable to external “shocks” which leads to an increase or decrease in leverage level (Caskey et al., 2012). The excess of leverage beyond the optimal level is believed to convey information about performance of firms and affect future stock returns, measured in buy-and-hold returns for 12 months. The negative relation found between leverage and future returns may be a combined effect of excess leverage and market inefficiency. The research has controlled the growth of assets one year ahead the current period based on the belief that companies may increase the leverage to acquire more assets.

Although other studies have similar findings, they relate leverage with risk which affects market price of stock. Penman and et al. (2007) dissect the book-to-price ratio into
operational and leverage components. While the operation component results in better accounting performance, the drop of return in the future period is likely driven by the leverage component, which induces higher financial risk. Yet, the reason leading to the existence of the negative relation between leverage and future returns is unknown. Subsequent research by George and Huang (2010) records a similar result. It is based on the argument that higher leverage level leads to higher chance of financial distress resulting in an increase of the distress costs. A related study by Nissim and Penman (2003) addresses how operating leverage and financial leverage influence profitability of the firm. Findings show that increasing operating liability lead to the rise in profitability.

Bradshaw, Richardson and Sloan (2006) have shown that future stock returns and their measurement of net external financing have a strong negative relation. In their example, an investment strategy generated 15.5% average yearly returns for 30 years. Besides, they have recorded that net external financing and future profitability have a negative relation. Their focus is on external financing, which includes both equity and debt, but our focus is only on total liabilities. Equity is not considered in our model.

Sivaprasad, Muradoglu and Gough et al. (2010) have suggested that leverage negatively associated with abnormal returns. They argue that the change in leverage is due to capital structure decision made by management. Firms with higher leverage are considered with higher risk. Thus, lower returns are observed for these companies.

Gomes and Schmid (2010) and Kose (2011) have tried to explain the relationship between leverage and stock returns. Gomes and Schmid (2010) have stated that the relationship is complex and relies on how management uses the debt and the effect of this decision on future investing opportunities. On the other hand, Kose (2011) has argued that the maturity of debt is the main driver in the relationship. The difference in the length of maturity of debts may affect stock price in different ways.

The articles discussed above are concerning leverage. Since we use growth in total assets as one of the controls in our regression analysis, related studies will be discussed.
The Value Relevance of the Growth in Assets

Cooper, Gulen and Schill (2007) have mentioned that cross-section of future stock returns can be predicted by annual asset growth rate of a firm. They have found the growth in assets affect returns of firms. Firm asset growth can be used as a reliable predictor than other standard variables, for example book-to-market equity and market capitalization of firms. The reason behind is that firm asset growth can capture common returns effect by examining elements in the overall financing and investment activities. This reason is supported by assumption that the capital market uses efficient pricing in real investment. Similar result is documented by Gray and Johnson (2011) based on the equity market in Australia.

Section 3: Data, Sample Formation, and Description of Variables

Based on the findings from the literature, we believe there is a relationship between the change in leverage and stock price. It is likely that the increase (decrease) in leverage reflects worsening (improving) current economic performance, with reference to the theoretical models of Myers (1984), Myers and Majluf (1984) and Miller and Rock (1985). Moreover, the assumption under the concept of value relevance is that investors make use of the accounting numbers on the financial statements to make rational decisions. (Barth et al., 2001) Thus, the change in leverage serves as a signal to investors and result in a decrease (increase) in stock price (Dimitrov and Jain, 2008).

Indeed, a reason leading to rising leverage is financing new projects. The fund generated from issuing debt can be used for investing activities, which results in the growth of assets. Since the performance of the firm can be affected by increasing assets (Cooper, Gulen and Schill, 2007; Dimitrov and Jain, 2008; Gray and Johnson, 2011), the growth of assets is controlled in our analysis to make sure that the information about change in financial leverage reflects current and future economic performance. Different from the study of Caskey et al. (2012), which the future growth of assets is controlled, the growth of assets in the current year will be controlled in our analysis.
We hypothesize a negative relationship exists between the change in leverage and contemporaneous stock returns in the Hong Kong stock market. Further, we hypothesize that the change in leverage consists of information of current economic performance, which will be shown accounting profit in the next period. Therefore, a negative relation is expected between the leverage and future performance.

Data and Sample Formation
The sample initially comprises all Hong Kong Hang Seng Index (HSI) common stocks with return data available on Thomson Reuters Datastream 8 available in the Hong Kong Baptist University (denoted by the Datastream) during the year of 2007 to 2012. The sample eliminates regulated utilities, financials and banks for the reason that regulatory factors influence choices on capital structure. The sample discards some observations according to several criteria. Firstly, observations need to have a year end lies on 31 December with five-year information available on the Datastream (Code from the Datastream: 05035). Besides, the firms need to have Hong Kong Dollar as reporting currency, with a average stock value of not less than HKD 7 from 2007 to 2012. The last criterion is that the Book-to-Market Ratio is not less than 0.01 and more than 100. These restrictions make sure the outcomes are not resulted from smallest of all firms and the financial ratios are not extravagant. Moreover, they make sure the stability of the data and the accuracy of the analysis on the current and future accounting earnings. We have obtained 279 observations. The following variables are calculated according to Dimitrov and Jain (2008).
Variable Descriptions

1. The Change in Financial Leverage

In our computation, the difference in financial leverage ($\Delta$Lev) for fiscal year, denoted as year $n$, is the change between the closing and the starting financial leverage for that year, where the financial leverage is calculated by total liabilities (Code: XWC03351) divided by total assets (Code: XWC02999).

$$\text{Total Liabilities} = \text{Total Liabilities} / \text{Total Assets}.$$  

We measure the average financial leverage (AveLev) of the current year as the level of financial leverage in year $n$.

2. Stock Returns

We calculate the stock returns by using the Datastream monthly files. In our computation, the current stock returns amount to buy-and-hold stock returns over the one-year period starting four months after the start of the fiscal year $n$. For the current stock return in year 2008, we use stock price from 1 May 2008 to 30 April 2009 because there is general lagging in the reporting of yearly accounting data. In our data, we only include firms that have non-ceasing monthly returns data over the one-year period.

3. Market Value

Market Value (MV) (Code: XWC08001) of equity is found from the Datastream. Market Value is the number of outstanding shares times the price per share at the year-end.

$$\text{Market Value (MV)} = \text{Number of outstanding shares} \times \text{Market Price at the year-end}$$

As for companies having more than one type of common shares, Market Value represents the total market capitalisation of the companies.
4. Book-to-Market Ratio

Book-to-Market ratio \((B/M)\) is defined as the total assets subtracted by total liabilities and their subtraction is divided by the total market value at the start of the fiscal year.

\[
B/M = \frac{\text{Total Assets} - \text{Total Liabilities}}{\text{Total Market Value}}
\]

All the data in this ratio are obtained from Datastream for consistency reason. Firms have a book-to-market ratio smaller than 0.01 or larger than 100 are excluded from our analysis.

5. Growth in Assets

The Growth in total assets \((\text{Growth TA})\) on stock returns are controlled as firms may borrow for operations or for growth (Dimitrov and Jain, 2008). For this reason, the value relevance of assets growth is being controlled. Growth in total assets is the changes in leverage over the same fiscal year \((\text{year } n)\).

6. Traditional Value-Relevant Measures

Accounting earnings \((\text{EBXI})\) are measured by the net income before preferred dividends (Code: XWC01551). From the shareholders’ point of view, if a firm has a positive (negative) earning, the firm is considered as performing healthy (badly) in a certain year. We use change in EBXI \((\Delta \text{EBXI})\) divided by total assets due to the difficulty in doing comparison across firms and time. Furthermore, we use change in operating cash flows \((\Delta \text{OCF})\) (Code:XWC04860) and change in total accruals \((\Delta \text{ACCR})\). The operating cash flows represent the net cash receipts and expenses resulting from the operation of the companies. It is the summation of operating funds in the firm. ACCR equals to the difference between net income and cash flow. OCF and ACCR are standardised by using the figures at the beginning of each year.
In the following section, we explain the summary statistics for the selected variables. The data summary is in Table 1.

Pearson correlation coefficients are shown in Table 2. As shown on the table, we observe a negative association between the changes in leverage and current stock returns (correlation: -0.157). Growth TA is positively correlated with current return but it is not very significant (correlation: 0.016) Consistent with our argument, it is possible that change in leverage captures economic performance, given that significant negative correlation with the change in current income (correlation: -0.528). Although the relation with the change in operating cash flow is insignificant (correlation: -0.076), a negative relation is observed. Moreover, a positive relation exists between the change in leverage and change in accruals. (correlation: 0.245) The rise in leverage may result in a rise in accruals at the same time.

<table>
<thead>
<tr>
<th>Variables</th>
<th>No.of Observation</th>
<th>Mean</th>
<th>Min.</th>
<th>Q1</th>
<th>Median</th>
<th>Q3</th>
<th>Max.</th>
</tr>
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<tbody>
<tr>
<td>∆Leverage</td>
<td>279</td>
<td>0.02</td>
<td>-0.904</td>
<td>-0.028</td>
<td>0.006</td>
<td>0.045</td>
<td>2.257</td>
</tr>
<tr>
<td>Current Return</td>
<td>279</td>
<td>-0.062</td>
<td>-44.13</td>
<td>-3.48</td>
<td>-0.12</td>
<td>3.79</td>
<td>55.62</td>
</tr>
<tr>
<td>Futuren Return</td>
<td>279</td>
<td>0.537</td>
<td>-42.5</td>
<td>-2.97</td>
<td>-0.02</td>
<td>3.79</td>
<td>55.62</td>
</tr>
<tr>
<td>MV (in HKD)</td>
<td>279</td>
<td>71,861,985</td>
<td>2,904</td>
<td>4,154,229</td>
<td>19,642,298</td>
<td>55,823,422</td>
<td>1,576,729,380</td>
</tr>
<tr>
<td>B/M</td>
<td>279</td>
<td>0.899</td>
<td>0.046</td>
<td>0.277</td>
<td>0.564</td>
<td>1.078</td>
<td>8.848</td>
</tr>
<tr>
<td>GrowthTA</td>
<td>279</td>
<td>0.227</td>
<td>-0.83</td>
<td>0.069</td>
<td>0.162</td>
<td>0.298</td>
<td>6.723</td>
</tr>
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<td>Ave Lev</td>
<td>279</td>
<td>0.483</td>
<td>0.05</td>
<td>0.312</td>
<td>0.438</td>
<td>0.617</td>
<td>3.391</td>
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<td>∆EBXI</td>
<td>279</td>
<td>0.063</td>
<td>-1.733</td>
<td>0.034</td>
<td>0.071</td>
<td>0.131</td>
<td>0.601</td>
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<tr>
<td>∆OCF</td>
<td>279</td>
<td>0.012</td>
<td>-0.366</td>
<td>-0.021</td>
<td>0.011</td>
<td>0.054</td>
<td>0.26</td>
</tr>
<tr>
<td>∆ACCR</td>
<td>279</td>
<td>-0.009</td>
<td>-3.915</td>
<td>-0.048</td>
<td>-0.006</td>
<td>0.042</td>
<td>4.211</td>
</tr>
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### TABLE 2

**Correlation Matrix**

<table>
<thead>
<tr>
<th></th>
<th>∆Lev</th>
<th>SR08_10***</th>
<th>FR08_10****</th>
<th>LogMV</th>
<th>LogBM</th>
<th>TA</th>
<th>AveLev</th>
<th>∆EBXI</th>
<th>∆OCF</th>
<th>∆ACCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>∆Lev</td>
<td>1</td>
<td>-0.157</td>
<td>-0.011</td>
<td>-0.219**</td>
<td>0.039</td>
<td>-0.1</td>
<td>.467**</td>
<td>-0.528**</td>
<td>-0.076</td>
<td>.245**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.132</td>
<td>0.852</td>
<td>0</td>
<td>0.518</td>
<td>0.096</td>
<td>0</td>
<td>0</td>
<td>0.206</td>
<td>0</td>
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</tr>
<tr>
<td>SR08_10</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>0.115</td>
<td>0.249**</td>
<td>0.072</td>
<td>0.016</td>
<td>-0.152*</td>
<td>.343**</td>
<td>.257**</td>
<td>-0.005</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.056</td>
<td>0</td>
<td>0.235</td>
<td>0.792</td>
<td>0.011</td>
<td>0</td>
<td>0</td>
<td>0.092</td>
<td>0</td>
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</tr>
<tr>
<td>FR08_10</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>0.088</td>
<td>-0.005</td>
<td>-0.033</td>
<td>-0.161**</td>
<td>.198**</td>
<td>.122*</td>
<td>-0.032</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.142</td>
<td>0.929</td>
<td>0.584</td>
<td>0.007</td>
<td>0.001</td>
<td>0</td>
<td>0.041</td>
<td>0.589</td>
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<tr>
<td>LogMV</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.246**</td>
<td>0.102</td>
<td>-0.192**</td>
<td>.494**</td>
<td>.141*</td>
<td>0.025</td>
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<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0</td>
<td>0.089</td>
<td>0.001</td>
<td>0</td>
<td>0.019</td>
<td>0.684</td>
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<td></td>
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<tr>
<td>LogBM</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.184**</td>
<td>-.181**</td>
<td>-.312**</td>
<td>-.132*</td>
<td>-0.1</td>
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<tr>
<td>Sig. (2-tailed)</td>
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<td>0.003</td>
<td>0</td>
<td>0.028</td>
<td>0.1</td>
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<tr>
<td>Growth TA</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.054</td>
<td>0.176**</td>
<td>0.088</td>
<td>0.009</td>
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<tr>
<td>AveLev</td>
<td>Pearson Correlation</td>
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<td>-0.393**</td>
<td>0.34</td>
<td>0.134</td>
<td>0.885</td>
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<tr>
<td>Sig. (2-tailed)</td>
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<td>0.003</td>
<td>0.143</td>
<td>0.378**</td>
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<tr>
<td>∆EBXI</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.393**</td>
<td>0.34</td>
<td>0.134</td>
<td>0.885</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.368</td>
<td>0.003</td>
<td>0.143</td>
<td>0.378**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>∆OCF</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-0.079</td>
<td>0.19</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0</td>
<td>0.079</td>
<td>0.19</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>∆ACCR</td>
<td>Pearson Correlation</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

***SR08_10 is the current return from year 2008 to 2010
****FR08_10 is the future return from year 2008 to 2010.
Section 4: Regression Analysis

We regress three-year of current equity returns on change in leverage and other control variables. As time series data is included, dummy variables are included in the regression but their results will not be reported. In reference to Dimitrov and Jain (2008), we use the log of market value (LogMV), the log of book-to-market (LogBM), and the level of leverage (AvgLev) as the controlling factors in our variables. In order to determine the effect of growth in stock returns and to make sure the growth in assets is independent from the changes in leverage, GrowthTA is included in the regression. Various combinations of traditional measures of operating performance are included. They are used to determine whether they contain information content about change in leverage for current stock returns. Furthermore, we extend our examination in future accounting performance while controlling current income, operating cash flow and growth in assets.

Model 1: Change in Leverage and Current Stock Returns

Firstly, we will consider the change in current return related to the change in leverage. In Model 1, we test the association of ∆Lev and current stock returns with the following controls: LogMV, LogBM, GrowthTA, AvgLev, ∆OCF and ∆EBXI. R² shown in Table 3 of 0.321 indicates that the model is valid in explaining the data. Considering the change in leverage (∆Lev), we observe the coefficient of -11.758 and t-statistic of -2.439 with significance smaller than 0.05. A negative correlation is shown between the change in leverage and current stock return even if we control the growth in assets. Although a positive relation is observed for the growth in assets, the significance is not satisfactory (coefficient: 2.151 and t-statistic: -1.801). The change in operating cash flow (∆OCF) and the change in earnings (∆EBXI) remain significant as expected with prior research. The significance of both variables is less than 0.05.

In model 1, the current return regression formula is as follows:

\[
\text{Current Return} = \beta_0 + \beta_1 \Delta \text{Lev} + \beta_2 \text{LogMV} + \beta_3 \text{GrowthTA} + \beta_4 \text{LogBM} + \beta_5 \text{AvgLev} + \beta_6 \Delta \text{OCF} + \beta_7 \Delta \text{EBXI}
\]

where ∆Lev is the main variable and LogMV, GrowthTA, LogBM, AvgLev, ∆OCF, ∆EBXI are control variables.
Table 3

The Change in Leverage and Current Stock Returns

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Standard Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.567</td>
<td>0.321</td>
<td>0.298</td>
<td>9.56006</td>
</tr>
</tbody>
</table>

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Beta</th>
<th>t-statistics</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-8.927</td>
<td>-1.653</td>
<td>0.099</td>
</tr>
<tr>
<td></td>
<td>ΔLev</td>
<td>-11.758</td>
<td>-2.439</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>LogMV</td>
<td>0.195</td>
<td>0.253</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>GrowthTA</td>
<td>2.151</td>
<td>1.801</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>LogBM</td>
<td>3.738</td>
<td>2.261</td>
<td>0.025</td>
</tr>
<tr>
<td></td>
<td>AvgLev</td>
<td>2.666</td>
<td>0.799</td>
<td>0.425</td>
</tr>
<tr>
<td></td>
<td>ΔOCF</td>
<td>30.102</td>
<td>3.591</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>ΔEBXI</td>
<td>27.341</td>
<td>4.976</td>
<td>0</td>
</tr>
</tbody>
</table>

Model 2: Change in Leverage and Future Accounting Performance

Following the research by Dimitrov and Jain (2008), the association of the change in leverage and future accounting performance will be considered in Model 2. Collins, Kothari, Shanken and Sloan (1994) have suggested that current income figures contain noise and may not be a timely measure in reflecting current year performance. Thus, the information about current year’s economic performance will be revealed in the next year because of the time lag. Based on the belief that the change in leverage is able to reflect fundamental performance (Dimitrov and Jain, 2008), we hypothesize that the changes in leverage and future convention measures of performance has a negative relationship.

We use the EBXI, one year ahead as the dependent variable. We control for cash flow and income in current period and both variables are divided by total assets to control for firm size. (Dimitrov and Jain, 2008) Same with our prior regression model, we control for the current growth in assets.

Different from the findings by Dimitrov and Jain (2008), we find that the significance of traditional measures in explaining future accounting performance has dropped (coefficient:
-0.722 and t-statistic: -6.429). While Dimitrov and Jain (2008) have stated that current earnings are the variables which have the biggest influence in the future earnings, we observe that the change in leverage in current period is the most significant. Moreover, the growth in assets is positive and significant (coefficient: 0.206 and t-statistic: 2.658). The result is still robust if we remove the growth in assets as controlling variable. The indication from our findings is that future performance can be explained by the change in leverage in the current period.

In model 2, the regression formula is as follows:

\[ \text{Future \ EBXI} = \beta_0 + \beta_1 \Delta \text{Lev} + \beta_2 \text{GrowthTA} + \beta_3 \text{OCF} + \beta_4 \text{EBXI} \]

where $\Delta \text{Lev}$ is the main variable, $\text{GrowthTA}$, $\text{OCF}$ and $\text{EBXI}$ are control variables.
Table 4
The Change in Leverage and Future Accounting Earnings

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Standard Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0.453</td>
<td>0.205</td>
<td>0.188</td>
<td>0.31222</td>
</tr>
</tbody>
</table>

Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>Beta</th>
<th>t-statistics</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>0.001</td>
<td>0.026</td>
<td>0.979</td>
</tr>
<tr>
<td></td>
<td>∆Lev</td>
<td>-0.722</td>
<td>-6.429</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>GrowthTA</td>
<td>0.206</td>
<td>2.658</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>OCF</td>
<td>-0.004</td>
<td>-0.856</td>
<td>0.393</td>
</tr>
<tr>
<td></td>
<td>EBXI</td>
<td>0.005</td>
<td>0.837</td>
<td>0.404</td>
</tr>
</tbody>
</table>

Findings
In line with our expectation, we observed three main findings. First, a negative correlation is founded between the change in leverage and current equity return. Second, the change in leverage also negatively correlated with future performance, meaning that the fundamental performance is embodied in the change in leverage. Third, the growth in assets is positively related but not remarkably affects stock price in stock return. Yet, it is significant in signaling future performance.

Section 5: Limitations, Recommendations and Conclusions

Limitations
There are several limitations we encounter in our findings. Firstly, the stock return is subject to external factors, such as the macroeconomy. For instance, our data is obtained from 2007 to 2012. However, the financial turmoil in 2008 has tumbled the world economy. The Hang Seng Index has fallen around 50% from 2007 to 2009. Therefore, the macroeconomy affects the value relevance of the change in leverage to the stock returns. Since only three years of observations are considered in our study, the accuracy of the result may be affected due to the short-term volatility in the equity market. Secondly, we derive the leverage from total liabilities when doing the analysis. Changes in various categories of liabilities may affect on stock price in different
ways. The result we reported is combined effect of the changes in liabilities. Thirdly, different assumptions in the length of time lag may affect the results.

Recommendations
During our analysis, future research can focus on the value relevance of leverage from different aspects. Firstly, the changes in operating liabilities and debts are suggested for future studies. With reference to prior researches, the level of operating leverage and financial leverage can affect stock price in an opposite direction (Penman, Richardson and Tuna, 2007; George and Hwang, 2010). Another possible aspect is to assess the change in level of debt with different length of maturity. As Kose (2011) proposed, debt maturity is one of the factors prevailing in the stock-return relation. Moreover, most facts used by the empirical studies are observations from the US stock market (Dimitrov and Jain, 2008; Cai and Zhang, 2011). As the value relevance of the financial data may depend on financial market environment (Ali and Hwang, 1999), investigating the value relevance of leverage in a non-US stock market can be a possible topic for further researches.

Conclusions
We follow the model set by Dimitrov and Jain (2008) and believe that a negative correlation exists between the change in leverage and current and future return. Our hypotheses are supported by empirical results. Current returns and the change in leverage have a Pearson correlation of -0.157. The negative relation between changes in financial leverage and current returns is strong with controlling variable such as GrowthTA, change in EBX1, change in operating cash flow and change in accruals. Besides, change in leverage has a significant negative correlation with the change in income (correlation: -0.528). These results confirm that change in leverage can be considered as value-relevant indicator.

Our results match with prior works, Cai and Zhang (2011) suggest that the change in leverage gives a signal to the investors about the value of stocks, despite the fact that they are based on different theories. Scholars document a negative relationship between the change in leverage ratio and stock price. Caskey, Hughes and Liu (2012) assume firms maintain debts in an optimal
level. As a result, any excess of leverage beyond the level is believed to reveal out-of-expectation performance of the firm and its future stock return.

In a view of fast changing economic environment and growing complexity in the financial market, we hope this paper can be a supplement to the existing studies related to the value relevance and provides an alternative in value relevant measures. With prior works and our empirical results, we believe that the change in leverage can be a significant supplement to the traditional value-relevant variables.
References


Sivaprasad, S., Muradoglu, Y., Gough, O., & Adami, R. (2010). The leverage effect on stock returns. *Available at SSRN 1690183,*