INVESTOR PROTECTION, FIRM FUNDAMENTALS INFORMATION, AND STOCK PRICE SYNCHRONICITY

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ABSTRACT

This paper reports a cross-country study on the use of firm fundamentals information (FFI) in capital market pricing decisions with institutional arrangements for investor protection (IP) as a moderating variable. We use accounting accruals information (AAI) as a proxy for FFI and stock price synchronicity (SPS) as a measure of use of FFI and other information in capital market pricing decisions.

Morck, Yeung and Yu (MYY) (2000) posit that when the information environment in a capital market is more developed, investors use FFI of firms in making investment decisions and this lowers SPS. Conversely, when the information environment in a capital market is less developed, investors rely more on market information in making investment decisions and this increases SPS.

Using data from 1995 to 2010 for the 40 countries of MYY, we find that AAI is associated with SPS only when IP levels are high, which suggests that investors rely on FFI in making investment decisions when IP is stronger.

1. INTRODUCTION

Morck, Yeung and Yu (MYY) (2000) illustrate that stock prices around the world are not equally effective in incorporating firm fundamental information (FFI). In their seminal work on stock price synchronicity (SPS), they report that SPS is lower in countries with stronger investor protection (IP). Assuming that SPS is a reflection of the use of FFI, they conclude that the use of FFI is lower in countries with greater impediments to informed trading due to the countries' weak legal and institutional structures. Kim and Shi (2012) find support for this view. They find that SPS is lower for International Financial Reporting Standards (IFRS) adopters than for non-adopters and that for IFRS adopters it decreases from the pre-adoption period to the post-adoption period. They also find that the SPS-reducing effect of IFRS adoption is lessened (heightened) for firms with high (low) analyst following and is stronger (weaker) for firms in countries with poor (good) institutional environments.

A growing body of research supports these findings internationally while others challenge the MYY conclusions. Alves, Peasnell, & Taylor, (2010) and Ashbaugh, Gassen, & La-Fond, (2006) investigate the conclusion of MYY that SPS is a measure of the firm-specific information capitalized in stock prices in international markets. They show that SPS does not capture FFI.

Alves et al. (2010) make no direct tests of FFI with SPS. They raise questions about the interpretability of R^2. Ashbaugh et al. (2006) attempt to show a direct association between FFI and SPS, but fail to provide conclusive evidence. One of the reasons for the unsuccessful attempt to draw a connection between FFI and SPS could be due to the small number of mostly highly developed countries' data used in the study, and the absence of a focus on a key aspect of accounting information, namely accounting accruals information (AAI). Ashbaugh et al. (2006) and MYY's variables are concerned with the current variability of firm performance as a proxy

for firm risk. Also, Ashbaugh et al. (2006) do not make allowance for the complementing effects of IP in the association between FFI and SPS. Given the small number of similarly developed countries in their sample, this aspect could not be tested. [1]

The purpose of this paper is to examine both the direct effects of FFI on SPS and the complementing effects of IP on the relation between FFI and SPS. In doing so, first the Ashbaugh et al. (2006) FFI measures are used and then a measure representing accounting based accruals is used. The tests of this study are akin to MYY's; however, this study uses a multi-year data set to reduce any single year bias that may have affected the MYY results.

We use several proxies of IP identified from MYY and other prior studies to explain the variation in SPS over time. The components of IP we use are Rule of Law (RoL), Government Efficiency (GE), Regulatory Quality (RQ), Control of Corruption (CoC), Political Stability (PS), and Voice and Accountability (VA) measures obtained from the World Bank. We also use stock market development (SMD) proxied by natural log of the number of companies as other explanatory variables.

Using a sample of MMY's forty countries with data from 1995 to 2010, we find a significant negative relation between IP and SPS. For the association between FFI and SPS, the Ashbaugh et al. (2006) FFI measures we use are *LOSS*, standard deviation of return on assets (*STDROA*) and standard deviation of sales (*STDSALES*). These FFI capture firm fundamentals that proxy for firm-level risk. We then use accounting accruals information (*AAI*) as another measure of FFI. AAI is a fundamental accounting construct that captures firm-specific information. For both FFI, we study the complementing effects of IP on FFI.

[1] Ashbaugh et al. (2006) use Australia, France, Germany, Japan, UK and US as their sample countries.

For the Ashbaugh et al. (2006) FFI, we find mostly inconclusive results, as Ashbaugh et al. (2006) did. For *AAI*, we find that on its own *AAI* does not provide conclusive results, but when complemented by *IP*, *AAI* has a negative association with SPS. In other words, when the quality of IP arrangements is better in a country, investors appreciate the information-enhancing aspect, and use *AAI* for investment decision making. *AAI* is both relevant and reliable. It is relevant because it reflects future economic benefits of a firm (Barth et al., 2008; Feltham & Ohlson, 1995). It is reliable when IP arrangements are stronger, as *AAI*, under higher quality IP, undergoes careful processing and greater scrutiny before it is released to the market. Likewise, we conclude that FFI is used to assess the fundamentals of firms in investment markets when it provides accruals-based information under higher quality IP arrangements. Therefore, we conclude that although FFI is not directly related to SPS on a consistent basis, the strong association of SPS with the interaction of FFI and IP suggests that investors rely on FFI in making investment decisions in strong IP countries.

The study contributes to both the synchronicity literature the capital markets institutions literature and the accounting literature. The study updates the understanding of market synchronicity and shows that cross-country variations in synchronicity remain. For the institutional literature, this study provides insights into how SPS is related to the firm-specific and country-specific constructs. It shows that FFI is dependent on the quality of IP. Therefore, better functioning investment markets need to have both better quality FFI and strong IP. To the accounting literature that deals with FFI, it adds that investors rely on accruals as a source of FFI. Accruals allows the flexibility to managers to better communicate their knowledge of the firm's economic position in financial reports (Dechow, 1994; Dechow, Kothari & Watts, 1998).

The paper is organized as follow. Section 2 provides the literature review. Hypotheses development and research method are reported in Section 3. Section 4 reports the results. Section 5 concludes the paper.

2. LITERATURE REVIEW

This section reviews cross-country studies of SPS and discusses whether SPS is a proxy for FFI capitalized in share prices in international markets through investment decisions of investors.

MMY in their seminal work on SPS find that stock prices around the world are not equally effective in incorporating FFI. MYY report that SPS is lower in countries with stronger IP. They use some measures of FFI in their study, but find no conclusive results for these measures. Assuming that SPS is a reflection of the use of FFI, they conclude that the use of FFI is weaker in countries with weaker legal and institutional structures.

Ashbaugh et al. (2006) specifically study the association of SPS with FFI in six developed equity markets and find inconsistent results (negative association for some countries, while positive for others). This inconsistency in results leads them to conclude that SPS does not represent FFI impounded in share prices across countries. Ashbaugh et al. (2006) also examine whether cross listing in the US stock market reduces SPS, but find no support for their hypothesis. They argue that differences in institutional arrangements (such as voluntary information flows, ownership structures, and trading activity) affect the price formation process in these markets.

Alves et al. (2010) also examine the quality of the information environment of their sample countries. They argue that if SPS is a proxy of the quality of information environment, then the spurious aggregation and decomposition should not change the R^2 proxy of SPS. Specifically, they investigate the statistical characteristics of the R^2 measure of SPS. They find that R^2 falls

(increases) when they create (decompose) a hypothetical country. These changes in R^2, they believe, cannot be referenced to the changes in the quality of the information environment, since this aggregation/decomposition represents the same quality of information environment. Moreover, they rank countries according to their average R^2 values and find that their rankings of a country's R^2 are different from those reported by MYY for 1995. They also document that the annual R^2 value changes from year to year. However, their sample selection and R^2 computation is different from the MYY's computation. Their sample of companies for each country is less than that of MYY's for 1995 and, unlike MYY, they do not control for the international market effects and currency exchange rates. However, both studies (Alves et al., 2010; Ashbaugh et al., 2006) conclude that R^2 does not represent FFI across countries.

Others study the information environments of developing countries and argue that markets in developing countries with an opaque information environment increase the cost of collecting firm-specific information. Therefore, analysts in these countries generate their forecasts based on macroeconomic or market information (Chan & Hameed, 2006). Likewise, stock prices in these countries generate less FFI leading to higher levels of SPS. In a similar study, Jin and Myers (2004) find that countries with opaque firms and weak financial systems have higher SPS.[2] Their results also show that higher crash frequencies are associated with higher R^2 values. Notably, these results are evident in countries with less developed financial systems and weak IP arrangements.

Li et al. (2004) find that lower country-level R^2 values are associated with greater capital market openness. However, this negative relation is contingent upon the strong IP arrangements of the countries. Similar results (negative relation) are found by Wang and Yu (2008) in their study of

[2]Jin and Myers (2004) investigate the relation of firms' opacity and SPS for 40 countries from 1990-2001.

accounting standards and SPS, but only when IP is a moderating variable. To sum up, these studies conclude that country-level strong IP arrangements help improve accounting quality, leading investors to capitalize FFI in making investment decisions.

Ashbaugh et al. (2006) conclude that SPS does not reflect FFI capitalized in stock prices. The accounting based FFI they use (loss, standard deviation of ROA and standard deviation of sales) are measures of the risk associated with firm performance. These variables may have two general effects. One aspect of these variables is the information source aspect. If SPS (R^2) represents firm-specific information, then the presence of these variables would provide risk measures for making investment decisions, leading to investors relying on these measures as FFI. However, these variables have another aspect, the economic aspect. Higher volatility in these variables would suggest that the firms are in distress, which could lead the investors to follow the market trend, thereby increasing SPS.

Other variables used by Ashbaugh et al. (2006), such as reporting of R&D, are normally reported by large firms. Moreover, although analyst following is associated with a richer information environment, it is not an accounting FFI variable. Further, including R&D and analyst following will reduce the sample size because only larger firms tend to have these variables. Their sample covers only a small number (six) of developed countries.

In addition, Ashbaugh et al. (2006) do not use the quality of regulatory environment as an intervening variable to examine the association between SPS and FFI. The quality of the regulatory environment and the quality of accounting standards can lead to a more reliable FFI, which when used by the investors are impounded in stock prices resulting in lower SPS. The evidence of IP

having an influence on SPS has been provided by MYY. However, MYY do not provide direct evidence of the influence of IP on the association between FFI and SPS.

Another possible reason for the inconsistent results could be the absence of drawing a connection between SPS and one of the key FFI accounting accruals information. Accruals provide incremental information beyond cash flow. Dechow (1994) reports that accruals are superior to cash-based measures as measures of firm performance. Similar arguments are also reported by Subramanyam (1996) who finds that accruals are priced by the market.

Accrual accounting provides information about a firm's earnings and its components and is a better indicator of enterprise performance than cash-based accounting information. It records transactions in the period they occur in an attempt to record the financial effects on the firm's economic performance. FASB Statement of Financial Accounting Concepts No. 1 (1978), paragraph 44 states:

> "Information about enterprise earnings and its components measured by accrual accounting generally provides a better indication of enterprise performance than does information about current cash receipts and payments."

Many studies investigate accruals as an information signal about earnings. For example, Dechow et al. (1998) and Dechow (1994) find that current earnings better predict future cash flows than current cash flows. Defond and Park (1997) find that discretionary accruals convey information about future profitability. Sankar and Subramanyam (2002) argue that managers use their discretion with appropriate restrictions in communicating private information to the market, thus increasing the information content of reported earnings.

Accrual accounting matches revenue and expense better than cash flow and thus makes accounting information more value-relevant. For example, Ali, Hwang and Trombley (2000) argue that

sophisticated investors are aware of the implications of accruals and cash flow components of earnings and accordingly adjust their estimates of future earnings. Subramanyam (1996) find evidence consistent with accruals conveying information about future profitability. Specifically, he finds that accruals are positively associated with future operating cash flow, and net income. Louis and Robinson (2005) study the effects of stock splits and accruals as a means of signaling private information to the market. They find results consistent with their hypothesis that the market prices the pre-split accruals at the split announcement. All these studies suggest that the market values accruals since it increases the ability of earnings to reflect the fundamental value of the firm.

Other studies examine which accruals component provides more information about earnings (see, e.g., Fairfield, Whisenant, &Yohn, 2001; Hribar, 2000; Sloan, 1996; Thomas & Zhang, 2002; Xie, 2001) and find that inventory accruals and discretionary accruals provide information to the market. Additionally, Barth et al. (2001) find that each component of accruals captures different information not only about delayed cash flows related to past transactions, but also about expected future cash flows related to management's expected future operating and investing activity (Barth et al., 2001, p. 28). Further, Richardson, Sloan, Soliman and Tuna (2001) find that the combined effects of asset and liability accruals provide more information than the individual components, and that non-discretionary accruals, sales growth, provide information about earnings quality.

Conversely, managers may use accruals to inflate earnings to either mislead investors or to expropriate funds. Consistent with this opportunistic view of accruals, Dechow et al. (1998) and Beneish (2001) show stock price declines for earnings management companies that are under investigation. Teoh, Yang and Zhang (2006) find that firms with income-increasing abnormal accruals in the year of an equity offer have subsequent stock underperformance. Sloan (1996) and

Xie (2001) show that future abnormal returns are largely negative for firms with a large component of accruals in their earnings. Moreover, Healey and Wahlen (1999) argue that firms that manage earnings upwards show subsequent stock price declines, whereas firms with downward earnings management show positive returns. It is worthwhile noting that the use of accruals depends on the IP arrangements of the respective markets. Thus, this study also investigates the association of SPS with accruals to ascertain whether accruals provide information to the market, or are an earnings manipulation tool.

3. HYPOTHESES DEVELOPMENT AND RESEARCH METHOD

3.1. Hypotheses Development

MYY and others argue that SPS is a function of firm-specific information. Based on this notion, Ashbaugh et al. (2006) posit that if investors rely on FFI rather than market-wide movements in making investment decisions, better quality FFI would reduce SPS. However, Ashbaugh et al. (2006) report that SPS does not reflect FFI and variation in stock returns occur due to noise or factors unrelated to FFI.[3] The Ashbaugh et al. (2006) FFI variables only reflect the income smoothing and risk measures related to firm's past performance and do not account for institutional arrangements. They use only a small set of countries, which allowed them to conduct only intra-country tests of association between FFI and SPS.

Accrual accounting information is often used to provide information to outsiders that reflect a firm's current and future performance (Dechow, 1994). Accrual accounting recognizes the expected future financial benefits and obligations accruing to an enterprise over a period. Accrual accounting matches revenue and expense better than cash flow accounting and makes accounting

[3]Such as Shiller (1980) and West (1988).

information more value-relevant (Hung, 2000). The investors' demand for and reliance on reliable publicly disclosed information may drive insiders to provide information that truly and accurately reflect a firm's economic performance (Healey & Wahlen, 1998). If investors perceive accruals as information signals, then this is likely to reduce SPS.

Theoretically, MYY's argument that SPS is a function of firm-specific information is logical because SPS is based on firm specific returns. Therefore, regardless of the proxy of SPS (Ashbaugh or accruals), we hypothesize:

H1: There is a negative association between FFI and SPS.

However, managers can use accrual accounting opportunistically to manage earnings. Insiders and controlling owners may have incentives to manage earnings either to mask firm performance and/or to hide their private control benefits from outsiders (Leuz et al., 2003). They do so by using their financial reporting discretion. In essence, insiders, in order to avoid outsiders' intervention, manage the level and variability of reported earnings. If investors perceive accruals to be an earnings management tool then higher accruals will increase SPS.

MYY argue that countries differ in the use of FFI because of different levels of IP across countries. They contend that the incorporation of FFI depends on the IP arrangements of the respective capital markets. For an efficient capital market not only FFI is important but also IP is a fundamental factor for reducing information asymmetry, and adequately capitalizing FFI in share price returns. Legal rules and their strict enforcement effectively protect outside investors (Leuz et al., 2003). MYY also argue that the level of IP arrangements regulates the quality of firm-specific information reported to outsiders. Thus, a strong IP system is likely to increase the use of FFI in capital markets

and reduce SPS. We expect IP to have a complementing influence, with the strength of IP arrangements enhancing the effects of FFI. Therefore, we hypothesize:

H2: The negative association between FFI and SPS is enhanced by IP.

3.2. Research Method

3.2.1 Sample

We sample the same 40 countries of MYY from 1995-2010. For computing SPS measures, we collect weekly share prices, the local market index, the US market index, and the currency exchange rates from DataStream International (DSI) for the sample countries over the sample period. For South Korea, the currency exchange rate against US$ is not available prior to 2006 on DSI. Therefore the exchange rates for South Korea for 1995-2005 are from OANDA.[4] The initial sample consisted of all firm-year observations taken from DSI with a total of 1,241,662 firm-year observations for all 40 countries (Table 1, column 2). For each country, we download share price data for active, dead, and suspended companies for each year. A company is included in the sample if it trades for at least 30 weeks of the year on the stock exchange. We calculate share price returns on biweekly basis for each company for each year for the sample period. Like MYY, we find that the computed biweekly returns contain outliers. If these are coding errors in share prices, this may bias results or add noise to data (MYY). Therefore, we exclude the observations for which the stock returns exceeds 0.25 in absolute value. Next, we compute SPS measures (*Com* and R^2) for each year for the sample countries. To be consistent across the sample period, we match the observations of companies across the sample period. After matching the companies on a yearly

[4] http://www.oanda.com/currency/historical-rates/

basis for the sample period, the sample reduces to 656,538 firm-year observations countries (Table 1, column 3).

We download *IP* variables from the World Bank website. The number of companies of each country is from DSI. We download firm fundamentals variables of net income, sales, total assets, market value of equity (share price multiplied by the number of share outstanding) and cash flow from operations from DSI. We use Ashbaugh et al's (2006) *Loss, STDROA*, and *STDSALES* as the first set of FFI variables. STDROA and STDSALES are computed on a five years rolling basis. Thus, we lose the first four years data (1995-1998) and the sample starts from 1999. We use *AAI* as the second proxy for FFI. To control for firm size, we scale both *STDSALES* and *AAI* by total assets. We match companies on the basis of FFI and both SPS measures (Com and R^2) for each year for the sample countries.[5] After matching the countries, the observations are reduced to 209,260 firm-year observations for the sample countries (Table 1, column 4).[6]

[5]There are differences in the number of companies (number of observations) for each year in each country; e.g., for one year, DSI returns data for 100 companies for FFIs while the SPS measures are available for 150 companies. Thus, in order to be consistent in the analyses, I match up companies on the bases of SPS measures and FFIs, which further reduces the sample.

[6]Alves et al. (2010) report that investigating the UK data for such extreme returns reveal that these are not measurement error and are likely to provide important new information about a firm. However, including these high return observations in the analysis does not change the results.

Table 1 No. of Firm-year Observations for the Analyses

Column 2, displays the number of firm-year observations for share price data for each country; Column 3 reports number of firm-year observations for computing SPS measures after dropping firms with less than 30 weeks trading on the stock exchange. The last Column displays firm-year observations for regression analyses after matching each company's FFI and SPS with returns less than |25%|.

1	2	3	4
Country	**TOTAL AVAILABLE OBSERVATIONS** Number of total firm-year observations with share price	**OBSERVATIONS WITH SPS** Number of firm-year observations for computing SPS measures with more than 30 weeks trading on stock exchange	**SAMPLE FOR FFI AND SPS STAGE** Number of matched firm-year observations for regression models for companies with return < |25%|
US	470,116	221,948	45,773
Japan	66,174	57,876	34,383
Hong Kong	17,022	14,640	15,373
China	19,929	19,368	12,728
UK	112,075	38,309	10,763
Taiwan	13,130	13,128	9,264
Malaysia	14,620	12,943	7,313
Germany	12,643	12,453	6,812
Australia	41,716	23,556	6,019
India	39,908	26,074	5,679
Canada	159,039	62,370	4,891
Singapore	12,937	8,872	4,507
Thailand	15,945	8,666	4,191
France	34,772	17,717	4,120
Greece	7,388	5,212	3,042
Italy	10,276	5,512	2,799
Indonesia	6,706	4,869	2,779
Brazil	16,754	8,546	2,488
South Africa	4,713	4,349	2,469
Sweden	19,516	7,171	2,453
South Korea	31,284	24,379	2,253
Turkey	5,651	4,600	2,032
Poland	5,059	3,589	1,743
Norway	8,072	3,604	1,668
Philippines	5,202	3,779	1,582
Finland	4,225	2,427	1,407
Spain	5,152	3,276	1,323
Chile	5,264	3,161	1,309
Denmark	6,778	3,840	1,266
Pakistan	6,556	4,552	1,061
Holland	10,870	4,116	1,039
Belgium	11,806	5,282	947
New Zealand	5,943	2,772	909
Austria	4,510	2,390	805
Mexico	8,885	2,969	764
Portugal	4,115	1,609	423
Ireland	2,697	1,119	338
Czech Rep	5,085	1,841	269
Colombia	3,401	1,096	244
Peru	5,728	2,558	32
Total	**1,241,662**	**656,538**	**209,260**

3.2.2 Research Design

We investigate the association of SPS with FFI. We use two distinct proxies of FFI. The first set of FFI is from Ashbaugh et al. (2006) and the second set is AAI.

For H1 we conduct an investigation of the association of SPS with FFI at the country-level. For this purpose, the following model is proposed:

$$SPS_{jt} = \alpha_0 + \alpha_1 FFI_{jt} + \alpha_2 IP_{jt} + \alpha_3 SMD_{jt} + \alpha_4 YEAR_t + \varepsilon \qquad (1)$$

Where *Com*, R^2 and *SYNCH* are the three SPS measures for country *j* at times *t*; FFI represents two distinct proxies of FFI; one set drawn from Ashbaugh et al. (2006), i.e., *LOSS* is equal to one if net income is negative and zero otherwise; *STDROA* is the standard deviation of return on assets calculated over a five year rolling basis; *STDSALES* is the standard deviation of sales scaled by total assets and is calculated on a five-year rolling basis. The second proxy for FFI is *AAI* (accrual accounting information) and is the standardized value of total accruals computed as operating income less cash flow from operations, scaled by total assets. As a country-level measure of *AAI*, we take the median value across all the firms scaled by its standard deviation to control for variation in the market; *IP* is investor protection and is the first principal component of the World Bank Governance Indicators; and *SMD* is stock market development proxied by the natural log of the number of companies. The variables *SMD* and *YEAR* are control variables. For the country-level analyses, we take the median value across all firms to represent a country-level observation for each year in each country. SYNCH is the first principal component of Com and R2. If IP helps in the informed arbitrage across countries (MYY), then we expect negative coefficients for IP.

For H2, we examine the association between SPS and both sets of FFI with the interaction of IP. The following model is estimated:

$$SPS = \alpha_0 + \alpha_1 FFI_{jt} + \alpha_2 IP_{jt} + \alpha_2 FFI*IP_{jt} + \alpha_6 SMD_{jt} + YEAR_t + \varepsilon \quad (2)$$

where $FFI*IP_{jt}$ represents the interaction of *IP* with respective FFI variables of loss, standard deviation of ROA, standard deviation of sales, and accruals (*IP*LOSS, IP*STDROA, IP*STDSALES,* and *AAI*IP*, respectively) in country j at times t.

Prior research uses *LOSS* as a news event which is reflected in returns (see, e.g., Hayn, 1995; Joos & Plesko, 2005). Both *STDROA* and *STDSALES* are included in the model for capturing the volatility of the firm fundamentals (Leuz et al., 2003; Wei & Zhang, 2006). Both measures have an effect on returns, which in turn affects SPS. Moreover, volatility of ROA and sales are included in the model due to differences in income smoothing and the potential influence of income smoothing on return-on-assets (Ashbaugh et al., 2006; Leuz et al., 2003). If firms smooth income, then the volatility of ROA and sales is likely to be low. This would be perceived in the market as lower quality accounting information and would result in high SPS.

3.2.3 Computation of Variables

MYY uses two measures for SPS, *Com* and R^2. First, we report computation of these SPS measures (*Com*, R^2). Next, we propose another measure, a principal component of *Com* and R^2. This is followed by the definitions of the explanatory and control variables of the study.

3.2.3.1 Co-movement

The first SPS measure is called co-movement (*Com*). This measure captures the tendency of company stock prices to move in the same direction (Khandaker & Heaney, 2008). It is the ratio of co-directional change at a particular period of time:

$$f_j = \frac{1}{T}\sum_t \frac{\max\left[n_{jt}^{up}, n_{jt}^{down}\right]}{n_{jt}^{up} + n_{jt}^{down}} \qquad \text{(a)}$$

where n_{jt}^{up} is the number of stocks in country *j* whose prices rise in period t, while n_{jt}^{down} is the number of stocks whose prices fall, and T is the number of total periods. The value of *Com* must lie between 0.5 and 1.0 where 1 means 100% share price movement while 0.5 shows that 50% of the stocks prices move in the same direction in a particular period.

3.2.3.2 Market Model R^2

MYY use a modified version of the market model proposed by French and Roll (1986) and Roll (1988) to estimate the relative amount of firm-specific information in stock prices. The simple explanation of this model is that after removing the return effects due to market-wide systematic factors, the remaining return volatility is due to firm-specific events. A low R^2 (coefficient of determination) from such estimation is possibly due to firms' returns capturing unique firm-specific information. Following MYY, we use the same R^2 model as a second measure of SPS. This measure is as an alternative way of distinguishing firm-specific stock price movements from market-wide price movements:

$$r_{it} = \alpha_i + \alpha_1 r_{mjt} + \alpha_2[r_{USt} + e_{jt}] + \varepsilon \qquad \text{(b)}$$

where *i* is the firm, *j* is the country, *t* a two week time period, r_{mt} is the domestic market index, and r_{US} is the US market return. The rate of change in the exchange rate per US dollar is e_{jt}. When calculating this model for the US, α_2 equals zero. The R^2 coefficient of determination for Equation (b) measures the percent of variation in the biweekly returns of stock we in a country *j*, explained by variations in country *j*'s market return and the US market return. Given this statistic for each firm we in country *j, we* replicate MYY's measure of R^2 which is defined as:

$$R_j^2 = \frac{\sum_i R_{ij}^2 \times SST_{ij}}{\sum_i SST_{ij}} \qquad \text{(c)}$$

as the second SPS measure, where SST_{ij} is the sum of squared total variations. Eq. (b) captures the SPS at firm level which is then averaged across all firms in the country sample to calculate a country-level measure. The R^2 measures the correlation of a firm's stock returns with the market return for a specific time period. Lower (higher) R^2 values represent low (high) level of SPS.

3.2.3.3 SYNCH

The SPS measures proposed by MYY, *Com* and R^2, are highly correlated (p-value < 0.01). Moreover, the market model measure of SPS (R^2) is a noisy measure as share prices are affected by many other exogenous variables. To combine the similar underlying properties of both SPS in one measure and to control for noise in R^2, we use principal component analysis (PCA) to extract a factor from the two SPS measures.[7]

[7]The principal component analysis (PCA) transforms a number of correlated variables into a number of uncorrelated variables called principal components (PC).

3.2.3.4 Explanatory Variables

IP is drawn from the World Bank Governance Indicators. *IP* represents the investor protection variables of Rule of Law (RoL), Regulatory Quality (RQ), Voice and Accountability (V&A), Control of Corruption (CoC), Government Efficiency (GE), and Political Stability (PS) obtained from the World Bank's Governance indicators. These World Bank governance indicators are constructed using the unobserved components methodology, a statistical methodology for constructing weighted averages from a data set, with weights reflecting the precision of the individual data sources (Kaufmann, Kraay, & Mastruzzi, 2009). Higher values correspond to better governance outcomes. These are survey responses from a large number of enterprises, citizens, experts, survey institutes, think tanks, non-governmental organizations, and international organizations (Kaufmann et al., 2009). These are the only variables available on a time-series basis.[8] Definitions of the constituent variables of *IP* are:

1. **Voice and Accountability (VA)** – measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
2. **Political Stability and Absence of Violence (PV)** – measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism.
3. **Government Effectiveness (GE)** – measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

[8] The World Bank governance indicators for the earlier years of 1995, 1997 and 1999 are not available as for the earlier years these indicators are computed on an alternate year basis. For the missing years we use mean values computed from the available observations.

4. **Regulatory Quality (RQ**) – measures the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
5. **Rule of Law (RL)** – measures the extent to which agents have confidence in and abide by the rules of society, in particular, the quality of contract enforcement, the police, and the courts.
6. **Control of Corruption (CC)** – measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

The above IP variables range from -2.5 to 2.5 where high scores represent an efficient governance system. These variables are positively and significantly correlated with each other (correlation ranges from 74% to 98% for all years) with a p-value ≤ 0.001 (not reported) in all cases. Moreover, Kaufman et al. (2009, p.5) report that these governance indicators should not be thought of as being independent of one another. Therefore, to remove multicollinearity, we use PCA of these variables to obtain a factor. we use this factor, termed *IP*, as the investor protection variable for the sample period.

We use two sets of FF variables. The first set of FFI is from the previous literature (Ashbaugh et al., 2006), which are loss (*LOSS),* standard deviation of ROA (*STDROA),* and standard deviation of sales (*STDSALES)* as the first set of FFI. *LOSS* is a dummy variable of 1 if the company reports a loss, otherwise 0; standard deviation of ROA and standard deviation of sales are the five-year rolling standard deviation of return on assets and sales. The second set of FFI variables has only one variable, i.e., accruals. we use standardized accruals *(AAI)* computed as net income less cash flow from operations. To control for firm size, the total accruals are scaled by total assets. Moreover, to control for variation across the market, this scaled accruals value is then divided by its standard deviation to compute a country-level proxy for each year.

3.2.3.5 Control Variables

The control variables are *SMD* and *YEAR*. Year fixed effect controls for macro-economic and regulatory changes across years.

4. RESULTS

4.1 Descriptive Statistics

Table 2 provides the descriptive statistics for the dependent and independent variables. The mean and median for *Com* is the same (0.65) with a small standard deviation (0.05). However, the mean and median for R^2 is different (0.18 and 0.16, respectively). The mean for *SYNCH* is 0.00 while median is -0.23. The skewness and kurtosis of the SPS measures reveal that these variables are normally distributed. The skewness and kurtosis of *SMD* show that it is not normally distributed. The reason for this is stock market development is proxied by the number of companies, which has a high variation among the sample countries. The skewness and kurtosis of the FFI variables *STDROA* and *STDSALES*, and *AAI* indicate that these variables are normally distributed. *LOSS*, a dichotomous variable, need not be normally distributed for our analyses.

Table 2Descriptive Statistics of the Dependent and the Independent Variables

Table 2 reports descriptive statistics. *Com*, R^2 and *SYNCH* are the three SPS measures;*LOSS* is a dummy variable of 1 if the company reports aloss, otherwise 0; *STDROA* and *STDSALES* are the five-year rolling standard deviation of Return on Assets and Sales; *AAI* is proxied by total accruals computed as net income less cashflow from operations scaled by total assets; *IP* is investor protection and is the first principal component of the World Bank Governance Indicators; *SMD* is stock market development and is represented by the natural log of the number of companies.

Variable	Mean	Median	StDev	Min	Max	Skew	Kurt
Com	0.58	0.58	0.03	0.50	0.74	0.83	0.90
R^2	0.15	0.13	0.10	0.02	0.56	1.20	1.95
SYNCH	0.00	-0.21	1.22	-2.23	4.21	0.99	1.25
LOSS	0.01	0.00	0.08	0.00	1.00	12.56	156.31
STDROA	3.29	3.06	1.58	0.18	8.21	0.76	0.19
STDSALES	0.09	0.09	0.04	0.01	0.22	0.49	0.46

AAI	-0.14	-0.13	0.11	-0.44	0.28	-0.12	0.27
IP	0.00	0.79	2.32	-5.57	2.89	-0.59	-0.91
SMD	2142	633	5402	157	40788	5.17	28.75
LnSMD	6.71	6.45	1.11	5.05	10.61	1.29	1.60

4.2 Bivariate Correlations of SPS and the Explanatory Variables

Table 3 reports bivariate correlations of the dependent and the independent variables. As expected, all SPS measures are highly correlated (0.81) and the correlations are statistically significant (p-value ≤ 0.01). This suggests that SPS measures proposed by MYY (*Com* and R^2) both represent a similar underlying construct. The *STDROA* is negatively associated with all SPS measures (p-values are 0.018, 0.005 and 0.000, respectively for *Com*, R^2 and *SYNCH*). Similarly standard deviation of *STDSALES* is also negatively associated with all SPS measures. This association is significant for R^2 and *SYNCH* with p-values of 0.086 and 0.009, respectively.[9] These results suggest that the FFI variables represent an information signal to the market, which investors consider for their investment decisions.

These results suggest that SPS reflects firm fundamentals being incorporated into share prices. *STDROA* is positively correlated with *STDSALES* and *AAI* and this correlation is statistically significant (p-values ≤0.01). One of the reasons could be that both sales and accruals are scaled by total assets to control for firm size. Another reason could be that sales are directly related to income. *LOSS* is negatively related to all SPS measures but its results are not significant.

[9] VIF values are calculated for all regression models and the highest value noted is 2.35.

Table 3Correlations for the Dependent and the Independent Variables

Table 3reports correlation coefficients for the pooled cross-sectional data.*Com*, R^2 and *SYNCH* are the three SPS measures; *LOSS* is a dummy variable of 1 if the company reportsa loss, otherwise 0; *STDROA* and *STDSALES*are the five-year rolling standard deviation of ROA and standard deviation of sales for each company; *AAI* is proxied by total accruals computed as net income less cash flow from operations scaled by total assets; *IP* is investor protection and is the first principal component of the World Bank Governance Indicators; *SMD* is stock market development and is represented by number of companies. The first row represents correlation coefficients while the second row representsthe respective probability values.

	Com	R^2	*SYNCH*	*LOSS*	*STDROA*	*STDSALES*	*AAI*	*IP*
R^2	0.81							
	0.000							
SYNCH	0.90	0.88						
	0.000	*0.000*						
LOSS	-0.02	-0.04	-0.03					
	0.539	*0.302*	*0.411*					
STDROA	-0.10	-0.12	-0.17	0.19				
	0.018	*0.005*	*0.000*	*0.000*				
STDSALES	-0.06	-0.07	-0.11	0.02	0.67			
	0.161	*0.086*	*0.009*	*0.546*	*0.000*			
AAI	-0.006	0.02	-0.05	0.01	0.24	0.32		
	0.896	*0.562*	*0.250*	*0.705*	*0.000*	*0.000*		
IP	-0.43	-0.36	-0.44	-0.01	0.12	0.20	0.12	
	0.000	*0.000*	*0.000*	*0.914*	*0.005*	*0.000*	*0.010*	
SMD	-0.19	-0.19	-0.23	0.19	0.24	0.15	0.27	0.15
	0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.001*	*0.000*	*0.001*

4.3 Regression Analysis

4.3.1 FFI from Prior Literature and SPS

We estimate Model 1 and Model 2 to examine the association of SPS with FFI from earlier literature. This analysis is conducted at country-level using pooled cross-sectional data. Table 4 reports the results. Panel A is for Model 1 while panel B is for Model 2. Model 2 provides results for SPS measures with FFI and their interaction with *IP* variables. In panel A, only *STDROA* is negatively associated with all SPS measures. This negative association is statistically significant with p-values of 0.092 for *Com*, 0.020 for R^2 and 0.003 for *SYNCH*. These results suggest that

investor value FFI, specifically ROA, while making investment decisions.*LOSS* is negatively associated with SPS measures of R^2 and *SYNCH* but this association is not significant. The *STDSALES* is positively associated with all SPS measures but is statistically significant for *Com* and *SYNCH*. This positive association could be due to the positive and significant correlation between *STDROA* and *STDSALES*.

These results suggest that investors view firms' performance as an important FFIin making investment decisions. Investors consider the volatility of firm's performance an important information signal; as Ashbaugh et al. (2006) report these variables are an information signal to the market. They report that if SPS reflects FFI, then there should be a negative association of these FFI variables and SPS since volatility of FFI represents risk and making informed arbitrage difficult. Additionally, *IP* is negatively associated with all SPS measures, and is highly statistically significant. *SMD* is also negatively associated with all SPS measures but is not statistically significant. The *IP* results are consistent with earlier results that strong property rights reduce SPS at country-level. Summing up, the negative association of *LOSS* and *STDROA* indicate that market participants price firm fundamentals. However, the inconsistent results of FFI with SPS make it difficult to reach a clear conclusion.

Table 4 Relation of SPS with FFI

Panel A reports results for Model 1 while Panel B is for Model 2 for *Com*, R^2 and *SYNCH*, respectively. *LOSS* is a dummy variable of 1 if the company reports a loss, otherwise 0; *STDROA* and *STDSALES* are the five-year rolling standard deviations of ROA and sales. *IP* is the investor protection variable and is the first principal component of the World Bank Governance Indicators. *SMD* is stock market development and is proxied by the natural log of the number of companies. The *IP*LOSS, IP*STDROA, IP*STDSALES* are the interactions of *LOSS*, *STDROA* and *STDSALES* with *IP* variable, respectively. The independent variables are the medians of all the companies in a country representing one observation for each country each year. F-stat is the F-statistic and Adj-R^2 represents the explanatory power of the regression model. The first row reports coefficients of the variables while the second value in italics is the respective p-value of the coefficient.

Variable	**Panel A Model 1**	**Panel B Model 2**

	Com	***R^2***	***SYNCH***	***Com***	***R^2***	***SYNCH***
Intercept	0.652	0.214	0.533	0.652	0.217	0.573
	0.000	*0.000*	*0.119*	*0.000*	*0.000*	*0.098*
LOSS	0.005	-0.005	-0.065	0.001	-0.013	-0.227
	0.857	*0.901*	*0.929*	*0.975*	*0.771*	*0.757*
STDROA	-0.003	-0.006	-0.150	-0.003	-0.005	-0.131
	0.045	*0.020*	*0.003*	*0.091*	*0.066*	*0.012*
STDSALES	0.126	0.161	4.04	0.096	0.089	2.872
	0.092	*0.212*	*0.065*	*0.219*	*0.507*	*0.209*
IP	-0.008	-0.012	-0.252	-0.004	-0.004	-0.099
	0.000	*0.000*	*0.000*	*0.082*	*0.247*	*0.172*
SMD	-0.001	-0.004	-0.056	-0.001	-0.004	-0.045
	0.412	*0.148*	*0.255*	*0.507*	*0.182*	*0.374*
*IP*LOSS*				-0.006	-0.011	-0.185
				0.434	*0.462*	*0.467*
*IP*STDROA*				-0.000	0.000	-0.008
				0.507	*0.886*	*0.662*
*IP*STDSALES*				-0.031	-0.087	-1.322
				0.340	*0.120*	*0.167*
Year	**Controlled**					
F-Stat	10.42***	11.42***	8.08***	9.06***	9.87***	7.16***
Adj-R^2	24.00%	25.9%	19.20%	24.30%	26.1%	19.70%

Next we estimate Model 2 to test hypothesis 2. This model investigates the association of FFI and the interaction of IP variables and FFI conjecturing that investors rely more on FFI in countries with good *IP* practices.

Panel B reports results of the interaction model. In panel B, *STDROA* again shows statistically significant negative association with all SPS measures (p-value ≤0.10 for *Com* and R^2; p-value ≤ 0.05 for *SYNCH*). All the interaction variables are in the expected negative direction except in one case where the interaction of *STDROA*and *IP* shows a positive relation with R^2. Overall, the negative association of the interaction term *(IP*FFI)* indicates that investors in countries with strong IP tend to price FFI in making investment decisions. Summing up, the reported negative associations in most cases, though statistically not significant, suggest that investors rely on FFI more in countries with strong property rights arrangements. These results also suggest that *IP*is a

strong determinant in reducing SPS in countries. Moreover, the coefficients on the year dummies are mostly negative and not significant. However, the result for the year 2008 (GFC) is positive and significant, showing that investors do not rely on *FFI* and *IP* in financial crisis years. This result is consistent with the results of earlier literature which reports that SPS increases during financial crises years (Li et al., 2003).

4.3.2 SPS and Accruals

We also run the same models (Model 1 & Model 2) for *AAI* using pooled cross-sectional data. Table 5 reports the results. As pointed out earlier in the sample section, due to the computation of the first set of FFI proxy, the sample period is reduced to 1999-2010. In order to compare the results for both sets of FFI, we drop the earlier years (1995-1998) from the regression analysis of SPS with *AAI*. Panel A (Model 1) of the table shows that *AAI* is positively associated with all SPS measures, but this association is not statistically significant. Therefore, a conclusion cannot be drawn about whether accruals are perceived as an FFI or as an earnings management tool in a capital market.

On the other hand, *IP* shows a negative and statistically significant association with all SPS measures (p-value ≤ 0.01), confirming earlier results. *SMD* is also negatively associated with R^2 (p-value ≤ 0.05) and *SYNCH* (p-value ≤ 0.05) but not with *Com*. However, important here is Model 2, that investigates the interaction of *AAI* and *IP*. The inclusion of the interaction term in the regression models tests the effect of *AAI* for countries with different levels of *IP*.

Table 5, Panels B and C report results of Model 2. Panel B shows a negative association of SPS with *AAI* but this association is not significant. Moreover, the associations of all three SPS

measures with *IP* and *AAI*IP* are negative and statistically significant (p-value ≤ 0.05 for both *IP* and the interaction of *IP* and *AAI*). These results indicate that investors value accruals as information signals in countries with strong *IP* arrangements.

Panel C includes *SMD* as an additional explanatory variable. The results do not change for *AAI*. In addition to this, *IP* (p-values of 0.000 with all SPS measures) and the interaction of *AAI* with *IP* (p-values of 0.021 with *Com* and 0.000 with R^2 and *SYNCH*) show a strong negative and statistically significant relation with all SPS measures. The interaction results suggest that accruals are considered as information signals by the market in countries with strong IP arrangements. In addition to this, the *IP* results indicate that countries with strong *IP* reduce SPS, which is consistent with the extant literature and earlier results of this study. To sum up, accruals are considered as important information signals by markets in countries with strong IP arrangements. These results suggest that the market values accruals since it allows earnings to reflect firm fundamentals (Ali et al., 2000; Dechow et al., 1998).

Table 5 Pooled Cross-Sectional Regression Results of SPS with *AAI, IP, SMD* and *AAIIP (To comparable to Ashbaugh et al (2006) results only 1999-2010 data are used)**

Panel A is for Model 1 while Panels B and C are for Model 2. *Com*, R^2 and *SYNCH* are the three SPS measures. *AAI* is proxied by total accruals computed as net income less cash flow from operations scaled by total assets; *IP* is the investor protection variable and is the first principal component of the World Bank Governance Indicators; *SMD* is stock market development proxied by the natural log of the number of companies in each country; *AAI*IP* is the interactions of *AAI* and IP; Year is a control variable; F-stat is the F-statistic and AdjR^2 is the explanatory power of the regression model. The first row reports coefficients of the variables while the second value in italics is the respective p-values.

	Model 1			**Model 2**					
Variables	**Panel A**			**Panel B**			**Panel C**		
	Com	***R^2***	***SYNCH***	***Com***	***R^2***	***SYNCH***	***Com***	***R^2***	***SYNCH***
Intercept	0.655 *0.000*	0.222 *0.000*	0.710 *0.072*	0.642 *0.000*	0.175 *0.000*	-0.018 *0.926*	0.649 *0.000*	0.205 *0.000*	0.442 *0.264*
AAI	0.005 *0.780*	0.026 *0.447*	0.488 *0.413*	-0.012 *0.507*	-0.035 *0.275*	-0.456 *0.409*	-0.006 *0.744*	-0.012 *0.730*	-0.103 *0.865*
IP	-0.008 *0.000*	-0.012 *0.000*	-0.253 *0.000*	-0.011 *0.000*	-0.021 *0.000*	-0.381 *0.000*	-0.011 *0.000*	-0.020 *0.000*	-0.370 *0.000*
SMD	-0.001 *0.264*	-0.006 *0.019*	-0.105 *0.034*				-0.001 *0.520*	-0.004 *0.131*	-0.067 *0.174*
AAI*IP				-0.019 *0.013*	-0.061 *0.000*	-0.930 *0.000*	-0.018 *0.021*	-0.057 *0.000*	-0.868 *0.000*
Year	**Controlled**								
F-Statistic	11.57	12.65	8.46	12.04	14.18	9.56	12.34	13.42	9.06
AdjR^2	23.60%	25.40%	17.91%	24.40%	27.81%	20.01%	25.22%	28.01%	20.16%

As a sensitivity test, we estimate the same model using full period pooled cross-sectional data (1995-2010) for SPS and *AAI* to ascertain if the results change. Results do change and are presented in Table 6. In Panel A, the association of *AAI* with R^2 becomes negative but the significance level does not change. Here the results are also inconclusive with respect to the use of *AAI*. The results for *SMD* with *Com* become negative and statistically significant (p-value of 0.05). For Panel B, the negative association of *AAI* becomes significant for R^2 (p-value of 0.056) and *SYNCH* (p-value of 0.09), suggesting that *AAI* is considered as FFI by the market participants. Moreover, the negative relation of *Com* with the interaction of *AAI* and *IP* gets stronger with a p-value ≤ 0.001 against the earlier results of p-value ≤ 0.013 (Table 5). Similarly, in Panel C, the results for the interaction of *AAI* and *IP* (p-value ≤ 0.001) and for *SMD* with a p-value ≤ 0.050 become highly statistically significant. These results change with the increase in the number of observation, which is a statistical property of the regression model.

To sum up, accruals is considered as important information signals by markets in countries with strong IP arrangements. All these results suggest that the market values accruals since it increases the ability of earnings to reflect the fundamentals of the firm (Ali et al., 2000; Dechow et al., 1998).

Table 6 Pooled Cross-Sectional Regression Results of SPS with *AAI, IP, SMD* and *AAIIP**[10]

Panel A is for Model 1 while Panels B and C are for Model 2. *Com*, R^2 and *SYNCH* are the three SPS measures. *AAI* is proxied by total accruals computed as net income less cash flow from operations scaled by total assets; *IP* is the investor protection variable and is the first principal component of the World Bank Governance Indicators; *SMD* is stock market development proxied by the natural log of the number of companies in each country; *AAI*IP* is the interaction of *AAI* and *IP*; Year is a control variable; F-stat is the F-statistic and AdjR^2 is the explanatory power of the regression model. The first row reports coefficients of the variables while the second value is the respective p-value given in italics.

	Model 1			**Model 2**					
Variables	**Panel A**			**Panel B**			**Panel C**		
	Com	***R^2***	***SYNCH***	***Com***	***R^2***	***SYNCH***	***Com***	***R^2***	***SYNCH***
Intercept	0.663 *0.000*	0.231 *0.000*	0.796 *0.010*	0.643 *0.000*	0.177 *0.000*	0.013 *0.942*	0.662 *0.000*	0.228 *0.000*	0.762 *0.013*
AAI	0.000 *0.839*	-0.000 *0.883*	0.003 *0.941*	-0.002 *0.108*	-0.005 *0.056*	-0.085 *0.088*	-0.003 *0.134*	-0.005 *0.080*	-0.077 *0.119*
IP	-0.008 *0.000*	-0.012 *0.000*	-0.246 *0.000*	-0.011 *0.000*	-0.017 *0.000*	-0.320 *0.000*	-0.011 *0.000*	-0.016 *0.000*	-0.310 *0.000*
SMD	-0.003 *0.018*	-0.008 *0.000*	-0.013 *0.000*				-0.003 *0.030*	-0.008 *0.000*	-0.122 *0.002*
AAI*IP				-0.018 *0.000*	-0.031 *0.000*	-0.513 *0.000*	-0.018 *0.000*	-0.030 *0.000*	-0.491 *0.000*
Year	**Controlled**								
F-Statistic	11.97	12.54	9.08	12.69	12.67	9.35	12.34	12.81	9.48
AdjR^2	23.61%	24.53%	18.54%	24.77%	24.74%	19.04%	25.22%	26.00%	20.14%

[10] These results are presented using the full sample period data (1995-2010) in comparison to the earlier Table 5 which uses data from 1999-2010. Table 5 provides results of pooled cross-sectional data in order to compare the results of both proxies of FFI (Variables used from Ashbaugh et al., 2006 as the first proxy and accrual accounting information *(AAI)* as the second proxy of FFI.

Furthermore, the results for 2008 (GFC year) (not tabulated) are positive and statistically significant and are also consistent with the earlier results for the first proxy of FFI (variables taken from Ashbaugh et al., 2006). These results suggest that investors do not use FFI and IP in years of financial distress. These results also suggest further analysis into the effects of year-wise use of FFI and the complementing effects of IP.

To sum up, these results suggest that though investors do not directly capitalize FFI in investment decisions but strong *IP* arrangements facilitate the use of *FFI* in capital markets. Thus investors perceive FFI as information signals in countries with strong IP. These results suggest that strong IP determines the quality of financial information reported to outsiders, which they capitalize in stock prices in capital markets. Moreover, these results are in line with earlier literature which reports that a country's legal and institutional factors explain differences in price-earnings relation across countries (such as, Ali & Hwang, 2000; Ball et al., 2000; Hung, 2000; Leuz et al., 2003). Importantly, these results also require caution when evaluating due to the positive association (such as for 2005 for *Com*, R^2, and *SYNCH*) of *FFI* with SPS and the use of *AAI* as a tool of earnings management.

4.3.3 SPS and Accruals – Additional Analysis:

We conduct a further confirmatory analysis to assess how much *IP* and *AAI* are associated with SPS. We cluster our sample on the basis of annual *SYNCH* of each country using the K-Means clustering technique. We identify four distinct clusters (Figure 1, Panel A), with Cluster 1 having the lowest *SYNCH* across all years and Cluster 3 having the highest *SYNCH* across all years, and the other two cluster falling in between the two.

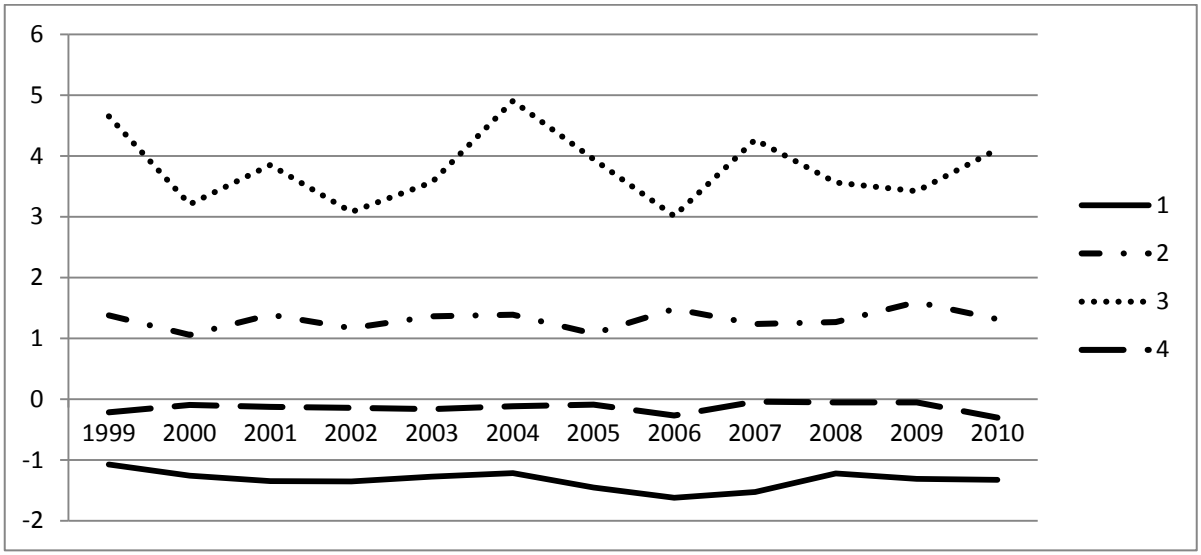
Further analysis of these clusters reveals that *IP* is the strongest determinant of these clusters (Panel B). Cluster 1 countries had the highest *IP* across all years and Cluster 3 had the lowest *IP* across most years, with the other two clusters falling in between with quite varying *IP*s across the sample years.

Cluster 1 also had the steadiest *AAI* and its year-by-year trend was closest to 0, suggesting that the countries in this cluster enjoyed smooth *AAI*s and did not have excessive *AAI*s (Panel C). In other words, their operating income was a good representation of cash based returns. Cluster 4, which had the second highest *IP*, also had smooth *AAI* but a bit further away from 0 than Cluster 1 *AAI*. Also, Cluster 4 had the second lowest *SYNCH* behind Cluster 1. Both clusters 2 and 3, the higher *SYNCH* clusters, had fluctuating AAIs.

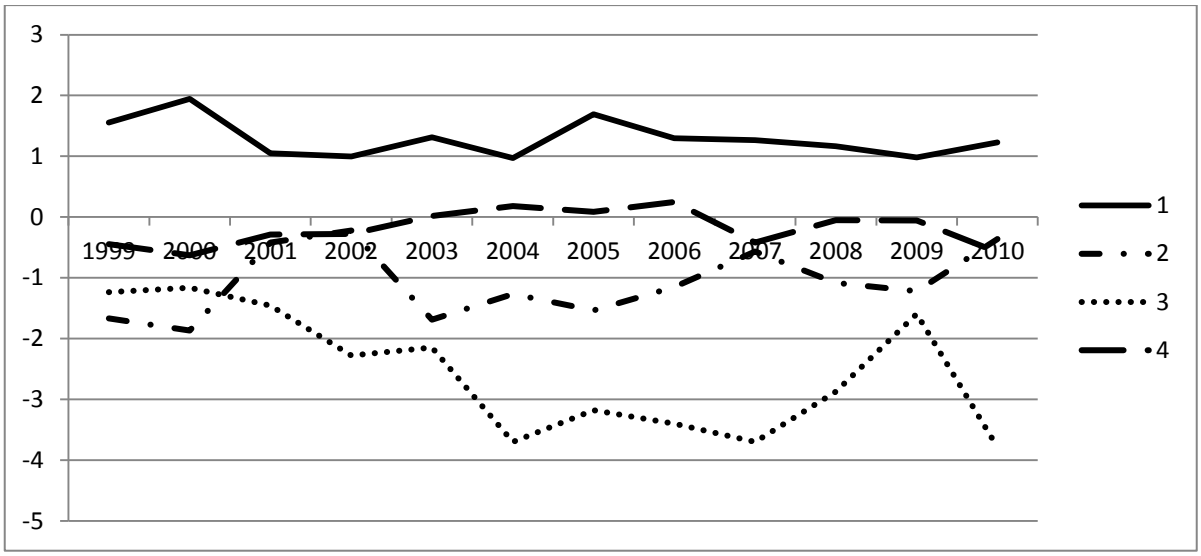
Finally, in Panel D of Figure 1 we chart the trends of the four clusters with regards to the interaction between *AAI* and *IP*. We find that the *AAI* trend for Cluster 1 improves due to the intervening effects of *IP*. This trend line is smooth and closely situated around 0. In other words, for the lowest *SYNCH* countries, the *AAI* are further improved due to better *IP* quality, which in turn results in more informed stock markets.

This visual analysis further illustrates that quality *IP* is important. However, *IP* and accounting based FFI together can make the corporate information setting even better.

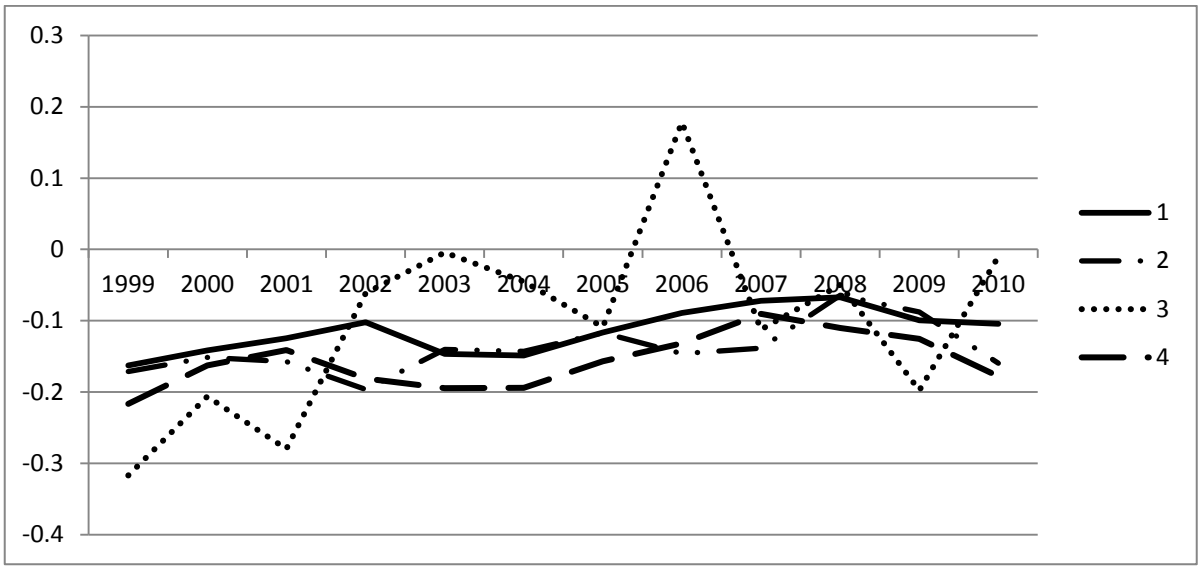
Figure 1 Cluster Analysis



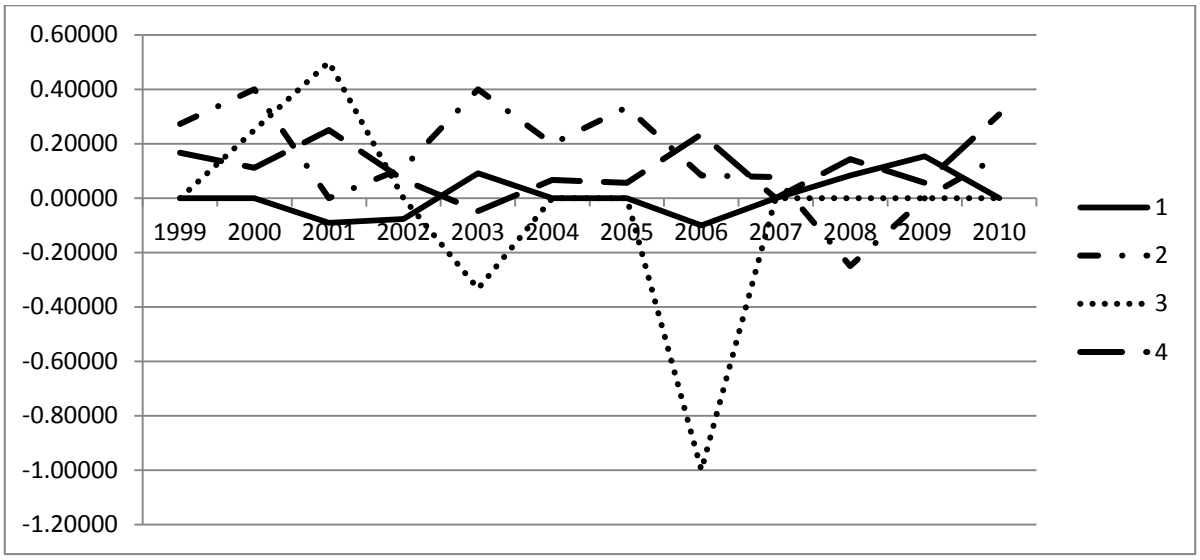
Panel A Cluster by SYNCH



Panel B Mean IP of each cluster across years



Panel C Mean AAI of each cluster across years



Panel D Mean AAI*IP (Interaction) of each cluster across years

Clusters:

Cluster 1: Australia, Canada, France, US, Belgium, Germany, UK, New Zealand, South Africa, Austria

Cluster 2: Italy, Malaysia, Singapore, Taiwan, Colombia, Spain, Greece

Cluster 3: China

Cluster 4: Denmark, Hong Kong, Indonesia, Peru, Chile, Norway, Sweden, South Korea\, Poland, Portugal, Brazil , Japan, Philippines, Finland, Holland , India, Mexico, Pakistan

Note: Ireland, Czech Republic, Turkey and Thailand had no significant membership in any cluster.

5. CONCLUSION

The purpose of this paper is to empirically provide evidence on the use of FFI under varying IP environments across a range of countries with high and low IP. The study conjectures that strong IP arrangements improve the information environment of the capital markets facilitating the use of FFI in investment decisions in these capital markets. Thus investors capitalize FFI in making investment decisions resulting in low levels of SPS.

The above proposition is tested by directly investigating the association of FFI with SPS and the complementing effects IP on the use of FFI in the capital markets. We use the same 40 countries of MYY for a sample period from 1995-2010. We follow MYY's proposed measures of SPS (Com and R^2), and also propose a new measure (SYNCH), which is the first principal component of MYY' measures.

We use two distinct proxies for FFI. The first proxy of FFI is taken from Ashbaugh et al. (2006) while the second proxy represents accounting based accruals called accounting accruals information (AAI).[11] For the complementing effects of IP, the IP variables are the same as used in the first stage of the study.

For the first proxy of FFI, we find that only volatility of ROA has a negative and statistically significant association with the SPS measures. We do not find any significant association for the interaction of *IP* and *FFI* with *SPS*. However, *IP* show a consistent negative and statistically significant association with *SPS*. For the second FFI proxy, we again do not find

[11] We use reporting of loss, standard deviation of ROA and standard deviation of sales from Ashbaugh et al. (2006) as a first proxy of FFI.

any direct association between *SPS* and *AAI*. However, the interaction of *IP* and *AAI* shows a negative and statistically significant association with SPS. The interaction of *IP* with FFI is based on the assumption that investors rely on FFI in countries with good IP practices.

These results imply that investors perceive accruals as information signals and rely on it in making investment decision. However, this association is dependent on the quality of IP arrangements of the countries; i.e., accruals provide information in countries with strong IP arrangements. These results are consistent with the view that countries with strong property rights have high quality FFI resulting in low earnings management (Leuz et al., 2003). These results suggest that investors perceive accruals as information signals to the market when making their investment decision in countries with strong IP (Ali et al., 2000).

Overall, these results suggest that IP is a strong and consistent determinant of the use of the FFI in capital markets around the world. IP arrangements are likely to increase the quality of firm-specific information. Thus, investors capitalize such information in share prices leading to informed arbitrage, which reduces SPS.

The results of this study need to be read within the wider context of cross-country studies of accounting, finance and economics. With many factors involved in stock market development and different countries having different economic and regulatory histories, it is difficult to conclude that investors price FFI in the same manner in each country. The differences in the IP leads to differences in the quality of financial information reported to outsiders. As Leuz (2010) puts it, reporting practices are unlikely to converge globally, despite widespread IFRS

adoption due to variations in institutional environments. Thus investors rely on the relevant set of FFI in making investment decisions.

In spite of these caveats, we believe that this study sheds light into the complex relation between synchronicity, accounting-based firm fundamentals, and country-level institutional arrangements. These findings highlight an important link between IP and reporting of quality accounting information to outsiders, and complement the international accounting literature that documents systematic patterns in the relation between stock returns and FFI. Further investigation into intra-country association of FFI and other sources of information is left to future research studies.

This paper has its limitations. The first limitation arises from the difficulty in identifying the IP measure. There are many facets of the development of a stock market (Wulandari & Rahman, 2004). Many countries in our sample had their unique experiences in developing their stock markets. The IP variable we use only broadly captures the state and level of market development of the sample countries. Furthermore, our IP variable is based on underlying variables that have ordinal scale properties, not ratio scale properties.

Second, there is a variety of other information sources other than accounting based firm fundamentals and other institutional arrangements present across the world with each having its impact on SPS. For example, studies (Chen, Roll, & Ross, 1986; Kilian & Park, 2009; Fama, 1981) suggest that macrocosmic news such as such as oil price shocks, inflation, and interest rates, affect share price returns and thus may affect SPS.

Third, the paper is limited to the use of country-level IP arrangements. There is no universally accepted IP index such as index developed on the basis of independence of the board of directors, audit committees, repute of external auditors etc. at the firm level which could be used across the study.

Lastly, the study uses total accruals as a proxy for FFI. Total accruals is a crude measure. The use of a more direct sophisticated measure of accruals such as abnormal accruals or components of accruals may give more robust results. However, due to data constraints such sophisticated measures could not be used for the purposes of this study.

There are several issues for future research. One issue is a more in-depth comparative analyses of the developed and developing countries with respect to IP environments at the firm-level in each country such as investigating the effects of board of directors, audit committees, and Big-4 auditors on SPS. Second, the effects of major corporate collapses or financial crises on SPS could be studied. Third, since the results of this paper suggest that macroeconomic indicators affect SPS, further investigation of the macroeconomic variable such as inflation, oil prices, the level of debt, and trade openness could be beneficial. Fourth, this study is only limited to the use of a few accounting based FFI items; an investigation of SPS with other FFI could be informative at the firm and country level. Fifth, this paper uses total accruals as an information signal; however, others may wish to investigate finer measures of earnings quality when the data are more readily available. Sixth, the relation of the timeliness and accounting conservatism with SPS could be an issue for future research. Ball et al. (2000) argue that conservatism facilitates monitoring of managers.

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