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WHAT EXPLAINS WIDENING PROFITABILITY DISPERSION AROUND THE WORLD?

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Abstract

This study explores the fundamentals of profitability dispersion across ten countries between 1982 and 2007. Profitability dispersion level and its time-series behavior vary by year and by country. Both accounting and economic factors cause this phenomenon. Using aggregate data, we report evidence that the dispersion is significantly related to income smoothing, discretion in reported earnings, the presence of small firms, and macro firm performance. The presented results are almost robust to the definition of profitability dispersion and differences of legal system. Our research contributes to the literature on international differences in earnings properties.

Keywords: profitability dispersion; earnings management; small firms
JEL Classification: M41

I. *Introduction*

Individual and household income inequality in the world has drawn the increasing attention of economics and sociology scholars. In this article, we shed light on dispersion in the corporate sector, which we term the 'profitability dispersion' of listed firms. Although prior studies, such as Givoly and Hayn (2000) and Fama and French (2004), suggest some determinants of profitability dispersion, to our knowledge, no comprehensive research has investigated the dispersion increases in countries outside the United States or explained profitability dispersion around the world.

This study explores the fundamentals of profitability dispersion across ten countries: Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, the United Kingdom, and the United States. The data are obtained from the Worldscope database provided by Thomson Reuters for the period 1982–2007. We define the profitability dispersion index (PDI) as the profitability gap between high-ranking firms and low-ranking firms and calculate it for each country-year, where ROA is adopted as the profitability measure. In this study, it is hypothesized that both accounting and economic factors affect the PDI. The former includes accounting conservatism, income smoothing, and accounting discretion, and the latter comprises the presence of small firms, macroeconomic productivity, and macro firm performance.

We first present the level of the PDI and its time-series behavior around the world. The

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main findings are threefold. First, in recent years, the dispersion has widened in most countries. Second, the process of expansion began around 1997. Third, common-law countries have experienced marked dispersion widening. It is visually evident that Australia, Canada, the United Kingdom, and the United States have had high-level profitability dispersion in recent years. To our knowledge, no previous study has established this phenomenon.

Next, we regress the level of profitability dispersion, namely, the PDI, on the accounting and economic factors mentioned above. Because the PDI is calculated for each country-year during 1982–2007 across ten countries, our sample is composed of 260 observations. Following Petersen (2009) and Gow et al. (2010), we use OLS with robust standard errors clustered by country and year in order to control for both time-series and cross-sectional dependence. Overall, the results show that both accounting and economic factors are related systematically to profitability dispersion, except for accounting conservatism. The result that accounting conservatism does not have a predominant effect on profitability dispersion is consistent with Gassen et al. (2006). We also investigate what factors affect *changes* in the PDI, and the results are similar to those of the regression of the PDI. Our hypotheses are more strongly supported in the second half of the period under study (1995–2007), in which the dispersion tends to widen in most countries, than they are in the first half (1982–1994). Indeed, these findings suggest that the recent surge in profitability dispersion is caused by both accounting and economic factors.

In line with literature on international comparison, we divide our sample countries into common-law countries and code-law countries. Our results remain unchanged. Both in common-law and code-law countries, accounting and economic factors explain profitability dispersion.

We conduct a robustness test and an additional analysis. First, we adopt the standard deviation of ROA as an alternative index of the dispersion. Although the significance levels are lower, the results are similar. Next, the cash-flows dispersion index (CDI), which is defined as cash-flows from operations (CFO) divided by total assets, is used to examine the direct effects of economic factors on the dispersion. We regress the CDI only on economic factors and find that they remain statistically significant. Thus, our results suggest that economic factors originally generate the real performance variability, and both this variability and some accounting factors generate the dispersion of accounting profitability.

The remainder of this paper is organized as follows. In Section II, we review literature and hypothesize the determinants of profitability dispersion. Section III contains the research design and compares the PDI among our ten sample countries. The empirical results are detailed in Section IV. We conduct a robustness check and an additional analysis in Section V. Section VI summarizes and concludes the paper.

II. *Literature Review and Hypotheses*

Several studies indicate that the dispersion of earnings or profitability is increasing in the United States. For instance, Givoly and Hayn (2000) argue that the expanded variability of earnings over the period 1951–1998 is consistent with more conservative financial reporting practices. Pastor and Veronesi (2003) point out that the dispersion of profitability increased between 1962 and 2000, which seems to explain the noticeable increase in the dispersion of

cross-sectional stock returns shown in the studies of Campbell et al. (2001) and De Silva et al. (2001). Fama and French (2004) note the increasing left skewness in the profitability distribution, which they mainly attribute to the small new lists of 1980–2001. Based on these studies, our research is interested in whether profitability dispersion increases around the world and examines what explains the level of the dispersion.[1]

In addition, the paper relates to the prior literature in three ways. First, this study relates to the literature on international differences in earnings properties, particularly accounting conservatism and earnings management. Ball et al. (2000) find that earnings in common-law countries are more conservative than they are in code-law ones, because under the shareholder governance model, common-law countries face greater demand for the timely incorporating of economic losses. Gassen et al. (2006) present the corresponding results on international differences in conservatism. Leuz et al. (2003) investigate earnings management across 31 countries and show distinct cross-country differences in their measures of income smoothing and accounting discretion, thereby providing evidence that the pervasiveness of earnings management is negatively related to investor protection. Our research complements these previous studies by focusing on the consequences of the international differences they find: what effects do conservatism and earnings management have on profitability dispersion around the world?

Second, our study relates to the literature on accounting losses. In the United States, a large number of studies report the incremental proportion of loss firms (e.g., Hayn 1995; Givoly and Hayn 2000; DeAngelo et al. 2004; Joos and Plesko 2005; Klein and Marquardt 2006). In addition, DeAngelo et al. (2004) also provide evidence of increasing earnings concentration; that is, the aggregate earnings of listed firms tend to be concentrated among top-ranking firms. Klein and Marquardt (2006) examine the fundamentals of accounting losses and find that both accounting and economic factors affect them, where loss firms can be described as 'low-ranking firms' in our study. Taking these studies into account, we focus on the profitability gap between high-ranking firms and low-ranking firms in order to investigate the determinants of it. Accordingly, our paper is an extended version of Klein and Marquardt (2006).

Finally, our research expands the research viewpoint of profitability dispersion.[2] Previous articles focus on profitability dispersion by industry. For instance, McEnally (1976) investigates the inter-industry dispersion of ROA in the United States and provides evidence consistent with Stigler (1963, 69)'s proposition: "The dispersion of average rates of return among competitive industries will be smaller than that of monopolistic industries." Using a sample of Japanese industrial sectors, Nguyen (2007) finds some determinants of inter-industry dispersion such as GDP growth and appreciations in the Japanese currency. By contrast, our focus is on profitability dispersion by country. This aspect of the dispersion has thus far not been detailed in the literature as far as we know.

Consistent with previous studies, such as Klein and Marquardt (2006), Dichev and Tang (2009), and Donelson et al. (2011), our hypotheses on the determinants of profitability

[1] John et al. (2008) and Acharya et al. (2011) compare the time-series volatility of return on assets around the world.

[2] In another line of dispersion study, Han and Manry (2000) evaluate the usefulness of dispersion in analysts' forecasts as an indicator of a firm's future ROE and future returns. Findings indicate that forecast dispersion is significantly and negatively associated with future ROE. Also, a significant negative association is found between dispersion and future returns.

dispersion are associated with both accounting and economic factors. The accounting factors include conservatism, income smoothing, and accounting discretion and the economic factors comprise the presence of small firms, macroeconomic productivity, and macro firm performance.[3] Each factor is defined as follows.

1. Accounting Conservatism

If accounting practices require the recognition of anticipated future losses, more conservative financial reporting leads to a greater variability of earnings (Givoly and Hayn 2000). Consistently, the data shown in Ball et al. (2000, Table 1) and Gassen et al. (2006, Table 1) show that the standard deviation of earnings tends to be larger in common-law countries, which reports more conservative earnings than do code-law countries. By contrast, Francis et al. (2004) find very small correlations between accounting conservatism and the standard deviation of earnings, and Gassen et al. (2006) provide evidence that when firm-specific factors are controlled for, legal regime is not significantly related to (conditional) conservatism. Accordingly, we examine the effect of accounting conservatism on profitability dispersion, but we do not predict its sign.

In previous literature, accounting conservatism is classified into conditional and unconditional conservatism (e.g., Ball and Shivakumar 2005; Beaver and Ryan 2005; Gassen et al. 2006; Ryan 2006). Gassen et al. (2006, 533) state that conditional conservatism affects "the shape of the earnings distribution" and unconditional conservatism changes "its position." We focus on conditional conservatism in order to investigate the determinants of profitability dispersion. Although conditional conservatism can typically be measured using Basu's (1997) return-based specification (Ryan 2006), stock return data are not available for many firms from our ten sample countries, especially in the earlier years of the date range under study.[4] Therefore, for each country-year, we estimate the following accruals-based regression model developed by Ball and Shivakumar (2006):

$$TAC_t = \alpha_0 + \alpha_1 DCFO_t + \alpha_2 CFO_t + \alpha_3 CFO^* DCFO_t + \varepsilon_t \quad (1)$$

In this model, the estimated α_3 can be described as the degree of conditional conservatism (Brown Jr. et al. 2006). Total accruals (TAC) are defined as the difference between accounting earnings (net income before extraordinary items and preferred dividends) and cash flows from operations (CFO). DCFO is the dummy variable that takes the value of one if CFO is negative and zero otherwise. Because it is not always possible to obtain CFO directly from the cash flow statements of all listed firms, we compute TAC and CFO as follows (Dechow et al. 1995):

$$TAC = (\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD - \Delta TP) - Dep \quad (2)$$

$$CFO = Earnings - TAC, \quad (3)$$

where TAC = total accruals, ΔCA = change in current assets, $\Delta Cash$ = change in cash and cash equivalents, ΔCL = change in current liabilities, ΔSTD = change in short-term debt in current liabilities, ΔTP = change in income taxes payable, Dep = depreciation and amortization

[3] The effect of accounting discretion is analyzed in "Robustness test" section later in this study.

[4] In addition, recent research points out limitations of Basu's (1997) model as a measure of conditional conservatism. See Ryan (2006) for a summary.

expenses, *CFO* = cash flows from operations, and *Earnings* = net income before extraordinary items and preferred dividends. If a firm does not report information on the short-term debt and income taxes payable, the changes in both variables, ΔSTD and ΔTP, are assumed to be zero. All variables are divided by total assets.

2. Income Smoothing

As has been well discussed in previous literature, managers have an incentive to decrease time-series earnings volatility (e.g., Graham et al. 2005; Myers et al. 2007). Although firms may attempt to smooth volatile income through earnings management, the effect of income smoothing behavior on profitability dispersion is not clear because firms have individual incentives to manage earnings up or down to reduce earnings volatility. In a given year, it is possible that high-ranking firms decrease earnings to reduce volatility, whereas low-ranking firms boost earnings to reduce volatility. This conjecture leads to the hypothesis that income smoothing behavior is negatively related to profitability dispersion. If the contrary actions are taken by each group of firms, however, profitability dispersion is expected to increase. Therefore, we examine whether income smoothing behavior increases or decreases profitability dispersion in the sampled ten countries.

Following Leuz et al. (2003), we compute the contemporaneous correlation between changes in TAC and changes in CFO for each country-year, where the smaller correlation suggests the greater degree of accruals management.[5] Considering the expression of the hypothesis, we multiply the correlation coefficient by minus one and use it as a proxy for income smoothing.

3. The Presence of Small Firms

In the United States, newly listed small firms seem to make profitability distribution more left skewed (Fama and French 2004). In support of this, Klein and Marquardt (2006) find that the increasing percentage of small firms is a major reason for an increase in the percentage of US firms reporting losses. Klein and Marquardt (2006) explain that this is because small firms are less diversified, have higher idiosyncratic risk, and are more likely to be at the ends of their business lifecycles than larger firms. Our interest is in the profitability gap between high-ranking firms and low-ranking firms. If small firms are more likely to report losses, and if the profitability of high-ranking firms is given, a country-year with the greater proportion of small firms will tend to have larger profitability dispersion. Accordingly, we predict a positive association between the presence of small firms and profitability dispersion.

We judge whether a firm is small by its amount of total assets (Fama and French 2001; Klein and Marquardt 2006). In Klein and Marquardt (2006), a firm is classified as a small firm if its total assets are less than those for the bottom quartile of NYSE-listed firms. Setting similar criteria is difficult for us because our study covers ten countries. Instead, we calculate the logarithm of the bottom quartile total assets for each country-year, then multiply it by

[5] Leuz et al. (2003) also develop another measure of income smoothing: a country's median ratio of the firm-level standard deviation of operating income divided by the firm-level standard deviation of CFO. In this study, we do not use this measure because we aim to analyze the degree of smoothing for each country-year.

minus one, and use this as a proxy for the presence of small firms.

4. Macroeconomic Productivity

Campbell et al. (2001) suggest that market index volatility and firm-level stock return volatility are higher during recessions in the United States. Klein and Marquardt (2006) find that macroeconomic productivity is negatively related to the proportion of loss firms. We thereby hypothesize that profitability dispersion becomes narrower for a country-year in an economic boom and wider in a recession. Following Klein and Marquardt (2006), the annual percentage change in real GDP is used as a proxy for macroeconomic productivity.

5. Macro Firm Performance

The last hypothesis is on firm performance as a whole. When the entire corporate performance is good, profitability dispersion is expected to shrink. Therefore, we predict a negative relation between macro firm performance and profitability dispersion. Although GDP is the index for macro performance, it includes not only the corporate sector performance but also the performance of the government and other entities.[6] We use median CFO divided by beginning total assets as a proxy for macro firm performance. Klein and Marquardt (2006) regard this measure as a firm's real performance and find that it is negatively related to the proportion of loss firms.

III. *Research Design*

1. Data

To measure profitability dispersion, we use the data for all publicly traded firms in ten developed countries except for the United States. For the United States, which has the largest number of listed firms in the world, firms listed on the NYSE, NASDAQ, and AMEX are included. The countries studied include Australia, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, the United Kingdom, and the United States. In our sample, Australia, Canada, the United Kingdom, and the United States are common-law countries, while France, Germany, Italy, Japan, the Netherlands, and Spain are code-law countries (La Porta et al. 1998).

We obtain all necessary data from the Worldscope database provided by Thomson Reuters, except GDP data, which are obtained from OECD National Accounts Statistics. The data sets span 26 years from 1982 to 2007. The period begins with 1982 because for many countries, the data used to calculate CFO are not accessible before then. Private firms are not covered because of a lack of data availability. As a result, 182,429 observations are used. Table 1 presents the

[6] Gross domestic product (GDP) is the market value of all officially recognized final goods and services produced within a country in a given period of time. GDP consists mainly of four factors: Government consumption expenditures and gross investment, Personal consumption expenditures, Gross private domestic investment, and Net exports of goods and services. GDP does not represent firm performance only. For instance, GDP components of the United Kingdom in year 2010 is 23% for government, 64% for personal, 15% for private domestic investment, and -2% for net exports. From these reasons, we use both macro firm performance and macroeconomic productivity in our analysis.

number of observations for each country-year.

TABLE 1. OBSERVATIONS BY YEAR

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Australia	76	83	84	84	88	91	81	117	133
Canada	193	200	210	215	257	268	277	311	322
France	132	142	146	157	168	168	172	320	383
Germany	180	186	190	212	224	235	240	316	384
Italy	36	41	47	51	60	64	75	141	147
Japan	115	129	145	182	226	251	250	256	441
Netherlands	47	51	52	59	60	60	60	100	107
Spain	31	33	33	37	40	39	44	74	93
UK	200	210	220	230	310	360	393	717	961
USA	1,051	1,090	1,155	1,250	1,308	1,362	1,389	1,466	1,554
Total	2,061	2,165	2,282	2,477	2,741	2,898	2,981	3,818	4,525

	1991	1992	1993	1994	1995	1996	1997	1998	1999
Australia	153	154	155	158	153	164	198	229	244
Canada	337	363	373	366	368	352	398	416	420
France	430	439	442	431	421	404	405	597	670
Germany	398	413	422	427	470	460	451	578	676
Italy	150	149	140	133	128	132	123	143	163
Japan	677	1,076	1,364	1,427	1,447	1,507	1,845	1,885	1,827
Netherlands	113	135	138	139	135	139	140	180	184
Spain	98	106	108	109	110	110	109	124	119
UK	1,026	1,028	1,037	1,017	1,018	1,015	971	1,158	1,140
USA	1,578	1,584	1,755	1,838	1,935	2,576	2,740	3,026	3,254
Total	4,960	5,447	5,934	6,045	6,185	6,859	7,380	8,336	8,697

	2000	2001	2002	2003	2004	2005	2006	2007	Total
Australia	276	390	622	1,004	1,029	1,107	1,195	1,234	9,302
Canada	645	826	923	1,015	1,148	1,236	1,302	1,263	14,004
France	715	718	680	647	647	655	636	589	11,314
Germany	715	685	669	643	650	670	680	667	11,841
Italy	180	197	201	200	216	223	238	239	3,617
Japan	2,463	2,859	3,000	3,203	3,243	3,357	3,460	3,522	40,157
Netherlands	170	160	154	151	151	149	153	146	3,133
Spain	115	120	117	113	115	110	115	110	2,332
UK	1,061	1,092	1,152	1,196	1,281	1,379	1,452	1,483	23,107
USA	3,831	3,811	3,799	3,822	3,932	4,033	4,149	4,334	63,622
Total	10,171	10,858	11,317	11,994	12,412	12,919	13,380	13,587	182,429

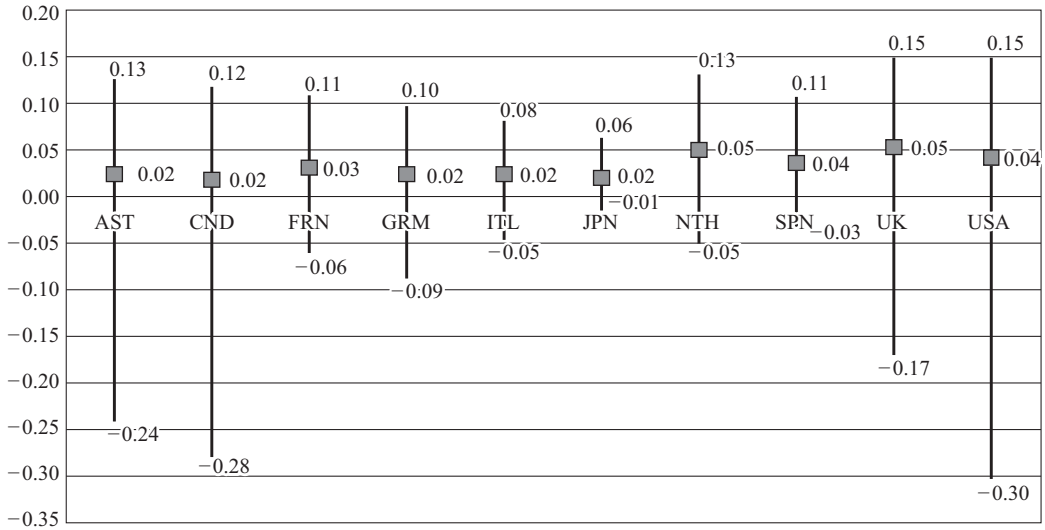
Note: After excluding observations with missing values for necessary items (net income, total assets, cash flows from operations, the change in total accruals, and the change in cash flows from operations), this study is based on 182,429 firm-year observations between 1982-2007 across 10 countries. Data are obtained from the Worldscope Database.

2. How to Measure Profitability Dispersion

We use ROA (net income divided by beginning total assets) to measure profitability

dispersion.[7] Figure 1 provides a graphical view of the profitability gap between the top decile of firms and the bottom decile of firms. The black boxes in the middle of the lines are the historical mean values of the median ROA. Although the ROA gap is wide in common-law countries such as Canada, Australia, the United Kingdom, and the United States, it is narrow in code-law countries such as France, Germany, Italy, the Netherlands, and Spain. The dispersion is the narrowest in Japan, where the top decile ROA is the lowest (0.06) and the bottom decile

FIGURE 1. INTERNATIONAL DIFFERENCE IN ROA DISTRIBUTION (From 1982 to 2007)



Note: ROA is defined as net income divided by beginning total assets. Upper limits indicate the top decile ROA values. Lower limits indicate the bottom decile ROA values. Square boxes indicate the median ROA values. Each value is the average over 1982-2007. AST = Australia; CND = Canada; FRN = France; GRM = Germany; ITL = Italy; JPN = Japan; NTH = the Netherlands; SPN = Spain; UK = the United Kingdom; and USA = the United States.

ROA is the highest (–0.01) of the ten countries investigated.

To comprehend this disparity, we define the profitability dispersion index (PDI) as follows and calculate it for each country-year.

$$PDI = Top\ Decile\ ROA - Bottom\ Decile\ ROA \quad (4)$$

The PDI essentially measures the profitability gap between high-ranking firms and low-ranking firms.[8] A higher PDI means a greater profitability dispersion; thus, if no earnings inequality exists, the PDI equals zero. OECD (2007) measures household earnings inequality in the

[7] We obtain similar results in this paper when we use net income before extraordinary items and preferred dividends instead of net income.

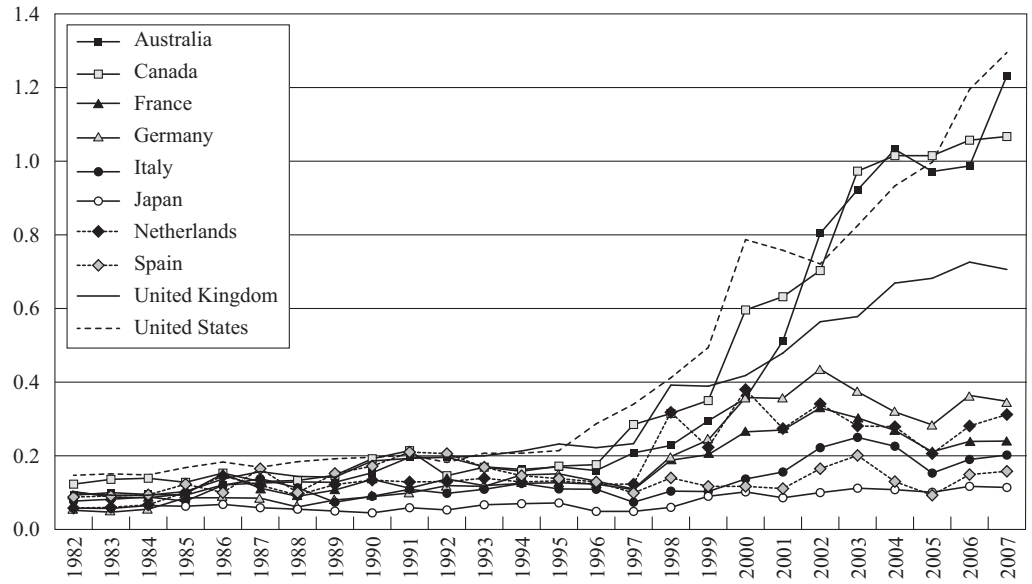
[8] We regard the top decile as the high-ranking firms and the bottom decile as the low-ranking firms. Our results remain almost the same if quartiles are used instead of deciles in the definition of the dispersion index.

sample ten countries using the ratio of top decile earnings to bottom decile earnings. When using standard deviations, omitting outliers is unavoidable. It may not be appropriate to omit extremely rich or poor households because such extreme observations often cause real earnings gaps in some countries. Our usage of decile data is in the spirit of analyzing the inequality between top and bottom. We recognize, of course, the possibility of measurement bias in using this approach and thus adopt standard deviations of ROA in the robustness check section.

In Figure 2, we plot the time-series behavior of the PDI for each country. Casual empiricism suggests three points. First, in recent years, profitability dispersion has widened in most countries. Second, this process of widening began around 1997. Third, common-law countries have experienced marked dispersion widening. In recent years, it is visually evident that Canada, Australia, the United Kingdom, and the United States have larger disparities than code-law countries do. In summary, profitability dispersion varies by country and fluctuates over time. To the best of our knowledge, no previous research has established this phenomenon. The picture compositions of Figure 1 and Figure 2 are simple but insightful to understand the macro structure of the economies in question.

Although accounting profitability measure is observable and reported, it is not necessarily equal to real economic performance. Increase of economic value should be measured by residual income, which is estimated by deducting cost of equity capital from net income (Stark 2004). In addition, accounting profitability is affected by accounting policy choices such as the depreciation method for the property, plant, and equipment. In that sense, our PDI does not necessarily capture economic performance itself. Nonetheless, as shown later, cash flow based dispersion index (CDI) co-varies with profitability dispersion index (PDI). CDI is not affected

FIGURE 2. THE PROFITABILITY DISPERSION INDEX (PDI) OVER TIME



Note: Profitability dispersion index (PDI) = top decile ROA – bottom decile ROA, where ROA is defined as net income divided by beginning total assets.

by accounting policy choices, and often used as real performance measure. We also try to mitigate the effect of accounting policy choices by measuring long term trend of PDI. From these reason, we believe that accounting performance can be substituted for real economic performance in spite of its weakness.

3. Regression Model

Our sample consists of 260 aggregate observations based on the data over the period 1982–2007 for the ten sample countries. To control for both time-series and cross-sectional dependence, following Petersen (2009) and Gow et al. (2010), we estimate equation (5) using OLS with robust standard errors clustered by country and year, namely, two-way clustering.

$$PDI_{it}=\beta_0+\beta_1 Conservatism_{it}+\beta_2 Smooth_{it}+\beta_3 Small_{it}+\beta_4 \Delta GDP_{it}+\beta_5 Performance_{it}+\varepsilon_{it}, \quad (5)$$

where PDI_{it} is top decile ROA minus bottom decile ROA for country i in year t, ROA is defined as net income divided by beginning total assets, $Conservatism_{it}$ is the estimated α_3 from equation (1) for country i in year t: TAC $=\alpha_0$ + α_1 DCFO + α_2 CFO + α_3 DCFO*CFO + ε, $Smooth_{it}$ is the Spearman correlation between the change in TAC and the change in CFO for country i in year t *–1, $Small_{it}$ is the logarithm of the bottom quartile total assets for country i in year t *–1, ΔGDP_{it} is the annual percentage change in real GDP for country i in year t, and $Performance_{it}$ is the median ratio of CFO to total assets for country i in year t.

We furthermore estimate equation (6) to investigate the determinants of the change in profitability dispersion:

$$\Delta PDI_{it}=\gamma_0+\gamma_1 \Delta Conservatism_{it}+\gamma_2 \Delta Smooth_{it}+\gamma_3 \Delta Small_{it}+\gamma_4 \Delta GDP_{it} +\gamma_5 \Delta Performance_{it}+\varepsilon_{it}, \quad (6)$$

where Δ indicates the annual change in each variable.

IV. *Empirical Results*

1. Descriptive Statistics and Correlation Coefficients

Table 2 shows the descriptive statistics of the variables, and Panel A of Table 3 provides the mean values of the variables for each country. Consistent with Ball et al. (2000) and Gassen et al. (2006), earnings are more conservative in common-law countries, that is, Australia, Canada, the United Kingdom, and the United States. By contrast, corresponding to Leuz et al. (2003), earnings management behavior, measured using the variables *Smooth* is more pervasive in code-law countries, that is, France, Germany, Italy, Japan, the Netherlands, and Spain. Panel B of Table 3, which shows the mean values of the variables for each year, suggests that earnings are becoming more conservative and less managed and that the presence of small firms, measured using the variable *Small*, is increasing over the period 1982–2007. These tendencies are consistent with previous studies (using data on US firms) such as Givoly and Hayn (2000) and Fama and French (2004).

The correlation coefficients are shown in Table 4. We can see some possibility of

multicollinearity among several of the independent variables. For example, the Pearson (Spearman) correlation coefficient between *Smooth* and *Small* is -0.785 (-0.802), and between *Small* and *Discretion* it is -0.517 (-0.547), where all p-values are less than 0.001 (less than 0.001). To avoid this problem, we estimate three types of models as follows: Model 1 adopts only accounting factors as the independent variables, Model 2 only economic factors, and Model 3 adopts both accounting and economic factors.

TABLE 2. DESCRIPTIVE STATISTICS OF VARIABLES

	Obs	Mean	Median	Min	Max	Std. Dev.
PDI	260	0.240	0.147	0.045	1.295	0.246
Conservatism	260	-0.001	-0.015	-5.646	3.945	0.791
Smooth	260	0.795	0.848	0.329	0.997	0.166
Small	260	-4.529	-4.664	-6.756	-1.303	1.036
ΔGDP	260	0.052	0.052	-0.010	0.101	0.018
Performance	260	0.069	0.076	-0.065	0.121	0.030

Note: Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $=\alpha_0 + \alpha_1$ DCFO $+ \alpha_2$ CFO $+ \alpha_3$ DCFO*CFO $+ \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

TABLE 3. MEAN VALUES OF VARIABLES SORTED BY COUNTRY AND YEAR

Panel A: Sorted by Country

	PDI	Conservatism	Smooth	Small	⊿GDP	Performance
Australia	0.371	0.112	0.720	-3.960	0.057	0.054
Canada	0.397	0.032	0.659	-4.140	0.053	0.060
France	0.167	-0.032	0.848	-4.390	0.048	0.069
Germany	0.184	-0.256	0.853	-4.493	0.045	0.071
Italy	0.128	0.013	0.888	-5.235	0.043	0.061
Japan	0.074	-0.032	0.894	-5.534	0.048	0.047
Netherlands	0.181	-0.376	0.840	-4.490	0.054	0.092
Spain	0.137	-0.051	0.888	-5.295	0.060	0.076
UK	0.317	0.275	0.724	-3.659	0.054	0.083
USA	0.446	0.302	0.636	-4.098	0.055	0.080
Mean	0.240	-0.001	0.795	-4.529	0.052	0.069
Median	0.183	-0.009	0.844	-4.440	0.053	0.070
Min	0.074	-0.376	0.636	-5.534	0.043	0.047
Max	0.446	0.302	0.894	-3.659	0.060	0.092

Panel B: Sorted by Year

	PDI	Conservatism	Smooth	Small	⊿GDP	Performance
1982	0.090	-0.176	0.920	-5.384	0.055	0.070
1983	0.090	0.024	0.933	-5.345	0.060	0.075
1984	0.093	0.104	0.923	-5.289	0.070	0.077
1985	0.104	-0.357	0.931	-5.380	0.061	0.080
1986	0.127	-0.207	0.915	-5.398	0.050	0.085
1987	0.126	-0.365	0.929	-5.600	0.061	0.048
1988	0.110	-0.281	0.936	-5.661	0.076	0.087
1989	0.119	-0.316	0.920	-4.975	0.070	0.070
1990	0.139	-0.233	0.891	-4.845	0.059	0.067
1991	0.152	-0.033	0.853	-4.811	0.045	0.075
1992	0.146	-0.294	0.835	-4.592	0.038	0.082
1993	0.147	-0.110	0.822	-4.492	0.031	0.081
1994	0.148	-0.281	0.819	-4.586	0.050	0.072
1995	0.152	0.153	0.803	-4.685	0.046	0.070
1996	0.151	0.078	0.814	-4.616	0.043	0.084
1997	0.163	-0.347	0.796	-4.571	0.049	0.089
1998	0.235	0.321	0.764	-4.245	0.044	0.081
1999	0.251	0.281	0.757	-4.081	0.045	0.080
2000	0.352	0.309	0.694	-3.910	0.061	0.065
2001	0.363	0.337	0.681	-3.628	0.048	0.062
2002	0.438	0.794	0.573	-3.493	0.038	0.042
2003	0.482	-0.394	0.568	-3.528	0.031	0.043
2004	0.498	0.833	0.604	-3.579	0.050	0.052
2005	0.471	0.158	0.667	-3.515	0.052	0.060
2006	0.530	-0.171	0.684	-3.685	0.056	0.054
2007	0.567	0.144	0.639	-3.874	0.054	0.045
Mean	0.240	-0.001	0.795	-4.529	0.052	0.069
Median	0.151	-0.072	0.817	-4.589	0.050	0.071
Min	0.090	-0.394	0.568	-5.661	0.031	0.042
Max	0.567	0.833	0.936	-3.493	0.076	0.089

Note: Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: $TAC = \alpha_0 + \alpha_1 DCFO + \alpha_2 CFO + \alpha_3 DCFO*CFO + \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

TABLE 4. CORRELATION COEFFCIENTS AMONG VARIABLES

	PDI	Conservatism	Smooth	Small	ΔGDP	Performance
PDI		0.344 (<0.001)	-0.860 (<0.001)	0.801 (<0.001)	-0.109 (0.080)	-0.083 (0.181)
Conservatism	0.244 (<0.001)		-0.405 (<0.001)	0.297 (<0.001)	-0.186 (0.003)	-0.211 (0.001)
Smooth	-0.860 (<0.001)	-0.283 (<0.001)		-0.785 (<0.001)	0.229 (<0.001)	0.156 (0.012)
Small	0.772 (<0.001)	0.202 (0.001)	-0.802 (<0.001)		-0.203 (0.001)	-0.020 (0.751)
ΔGDP	-0.021 (0.743)	-0.093 (0.134)	0.160 (0.010)	-0.174 (0.005)		0.162 (0.009)
Performance	-0.477 (<0.001)	-0.109 (0.078)	0.348 (<0.001)	-0.238 (<0.001)	0.097 (0.120)	

Note: Pearson (Spearman) correlation coefficients are presented below (above) the diagonal. P-values are presented in parentheses. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $= \alpha_0 + \alpha_1$ DCFO $+ \alpha_2$ CFO $+ \alpha_3$ DCFO*CFO $+ \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

2. Regression of the PDI

Table 5 presents the regression results of equation (1) using OLS with two-way robust standard errors. The results of Model 1, in which only accounting factors are included, are in line with our earlier discussion. A negative relation is observed between *Smooth* and the PDI, which is statistically significant at the 0.01 level. On the whole, earnings management is negatively related to profitability dispersion. By contrast, *Conservatism* does not seem to affect the dispersion.

In Model 2, we investigate the effect of only economic factors. The results are consistent with our hypothesis, except for ΔGDP. The estimated coefficients on *Small* are positive and statistically significant at the 0.01 level. We find a positive association between the presence of small firms and profitability dispersion, which supports our hypothesis. The estimated coefficient on *Performance* is negative and statistically significant at the 0.01 level. When the macro corporate performance is good, profitability dispersion shrinks. However, the estimated coefficient on ΔGDP is significantly positive, which is contrary to our hypothesis. This may be due to the effect of the non-corporate sector, but more investigation is needed in the future.

Model 3 includes both accounting and economic factors as independent variables. The regression results are largely consistent with our hypotheses and show that both accounting and economic factors are related systematically to profitability dispersion. To summarize, profitability dispersion is large when earnings are less smooth, when listed firms are smaller, and when real firm performance is bad. The R-squared values are relatively high in all three models: 75.2 percent, 70.5 percent, and 83.1 percent, respectively. This suggests that the factors under study well explain the structure of profitability dispersion.

TABLE 5. REGRESSION RESULTS OF THE PDI

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	0.000	0.00			0.004	0.27
Smooth	(?)	-1.278	-8.02***			-0.864	-5.61***
Small	(+)			0.171	6.90***	0.065	3.68***
ΔGDP	(-)			1.818	3.17***	1.912	3.83***
Performance	(-)			-2.618	-4.07***	-1.822	-3.14***
Cons	(?)	1.256	9.49***	1.101	7.57***	1.250	12.24***
R-squared		0.740		0.705		0.819	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $=\alpha_0 + \alpha_1$ DCFO + α_2 CFO $+\alpha_3$ DCFO*CFO + ε, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

3. Regression of Changes in the PDI

The regression results of equation (6) are shown in Table 6, whose structure is the same as Table 5 except that the variables measure a one-year change. The estimated coefficients on *ΔConservatism* are positive but not statistically significant. The coefficients on *ΔSmooth* are negative and statistically significant. *ΔSmall* and *ΔGDP* are positively related to *ΔPDI*. *ΔPerformance* has a significantly negative effect on *ΔPDI*. Profitability dispersion decreases with the growth rate of firm performance.

In summary, the regression results of the changes in the PDI are largely consistent with those of the PDI levels. Thus, it is reasonable to suppose that both accounting and economic factors change profitability dispersion. Although the R-squared values are lower than those in the analysis of dispersion levels, they retain reasonable explanatory power: 10.8 percent, 12.2 percent, and 20.4 percent, respectively.

TABLE 6. REGRESSION RESULTS OF THE CHANGES IN THE PDI

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
ΔConservatism	(?)	0.004	1.60			0.003	1.18
ΔSmooth	(?)	-0.314	-3.56***			-0.265	-3.14***
ΔSmall	(+)			0.036	1.69*	0.025	1.31
ΔGDP	(-)			0.240	1.41	0.333	2.20**
ΔPerformance	(-)			-0.640	-2.06**	-0.548	-2.16**
Cons	(?)	0.016	2.52**	0.004	0.45	-0.003	-0.44
R-squared		0.107		0.122		0.191	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $=\alpha_0 + \alpha_1$ DCFO $+ \alpha_2$ CFO $+ \alpha_3$ DCFO*CFO $+ \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

4. Regression Results for the Sub-periods

The evolution of the PDI shown in Figure 2 naturally leads us to split the sample period into two: the first half (1982–1994) and second half (1995–2007). We estimate equation (5) by sub-period. Panel A of Table 7 presents the results for the first half. The estimated coefficients on *Smooth* and *Small* are statistically significant in Model 3. By contrast, in the second half (Panel B of Table 7), *Smooth*, *Small*, and *Performance* have statistically significant effects on profitability dispersion, where the signs are consistent with our predictions. Additionally, in all models shown in Table 7, the R-squared values are higher in the second half than they are in the first half. These findings support our results so far and suggest that the recent surge in profitability dispersion is caused by both accounting and economic factors.

TABLE 7. REGRESSION RESULTS OF THE PDI BY PERIOD

Panel A: Results for the First Half (1982-1994)

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	-0.005	-1.38			-0.001	-0.36
Smooth	(?)	-0.412	-6.54***			-0.319	-6.17***
Small	(+)			0.038	5.19***	0.018	3.12***
ΔGDP	(-)			-0.101	-0.57	0.085	1.61
Performance	(-)			0.093	0.56	0.053	0.31
Cons	(?)	0.490	9.13***	0.314	8.64***	0.492	10.31***
R-squared		0.568		0.408		0.627	

Panel B: Results for the Second Half (1995-2007)

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	0.001	0.07			0.008	0.54
Smooth	(?)	-1.548	-7.42***			-0.964	-4.24***
Small	(+)			0.184	5.20***	0.077	3.54***
ΔGDP	(-)			2.524	2.82***	2.116	3.10***
Performance	(-)			-3.006	-3.09***	-1.983	-3.20***
Cons	(?)	1.435	8.87***	1.156	8.35***	1.358	11.50***
R-squared		0.745		0.708		0.825	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: $TAC = \alpha_0 + \alpha_1 DCFO + \alpha_2 CFO + \alpha_3 DCFO*CFO + \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t *−1, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

5. Regression Results by Legal System

When looking at the evolution of the PDI by the country in Figure 2, it is natural to attribute the regression results to the difference of legal system. So, we divide countries into common-law and code-law. Australia, Canada, the United Kingdom, and the United States are common-law countries, while France, Germany, Italy, Japan, the Netherlands, and Spain are code-law countries (La Porta et al. 1998).

Empirical results are shown in Table 8. The economic impact of our factors are stronger in common-law countries than in code-law ones. For example, the coefficient of *Small* in common-law is twice as large as that in code-law. Still, overall results remain unchanged. That is to say, accounting factors and economic factors well explain PDI both in common-law and code-law countries.

TABLE 8. REGRESSION RESULTS OF THE PDI BY LEGAL SYSTEM

Panel A: Results for the Code-Law-Countries

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	0.002	0.34			0.004	0.50
Smooth	(?)	-0.703	-7.81***			-0.548	-9.04***
Small	(+)			0.075	4.41***	0.034	3.93***
ΔGDP	(-)			0.229	0.69	0.604	2.40**
Performance	(-)			-0.291	-0.72	-0.066	-0.18
Cons	(?)	0.757	8.82***	0.521	4.53***	0.763	7.39***
R-squared		0.645		0.510		0.716	

Panel B: Results for the Common-Law-Countries

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	-0.004	-0.16			0.010	0.47
Smooth	(?)	-1.504	-7.22***			-0.813	-2.92***
Small	(+)			0.159	3.37***	0.065	2.42**
ΔGDP	(-)			0.717	0.82	1.927	1.92*
Performance	(-)			-4.138	-2.60**	-3.230	-4.10***
Cons	(?)	1.413	8.94***	1.259	6.25***	1.311	11.37***
R-squared		0.724		0.771		0.838	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $=\alpha_0 + \alpha_1$ DCFO $+ \alpha_2$ CFO $+ \alpha_3$ DCFO*CFO $+ \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t $*-1$, Small is the logarithm of the bottom quartile total assets for country i in year t $*-1$, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

V. *Robustness Test and Additional Analysis*

1. Alternative Measure of Profitability Dispersion

In this section, we check the robustness of our results and conduct an additional analysis. First, we re-estimate equation (5) using the standard deviation of ROA, another dispersion index, as the dependent variable. For each country-year, the values of ROA are winsorized at the one percent level on either tail in order to avoid the effect of outliers.

The regression results in Table 9 are similar to the original ones. Although the significance levels are lower, the estimated coefficients on *Smooth*, *Small*, and *Performance* are significantly different from zero and are in the predicted directions. Therefore, our findings are mostly robust

to the measures of profitability dispersion.

TABLE 9. USING STANDARD DEVIATION OF ROA AS THE DEPENDENT VARIABLE

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	0.103	0.99			0.106	1.02
Smooth	(?)	-1.787	-3.14***			-1.925	-2.37**
Small	(+)			0.222	2.28**	-0.027	-0.37
ΔGDP	(-)			3.070	2.12**	3.515	2.13**
Performance	(-)			-2.786	-1.66*	-0.855	-0.62
Cons	(?)	1.662	3.35***	1.280	2.46**	1.529	3.64***
R-squared		0.332		0.205		0.347	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: ROA is net income to total assets, Conservatism is the estimated α_3 for country i in year t from the equation: TAC $=\alpha_0 + \alpha_1$ DCFO $+ \alpha_2$ CFO $+ \alpha_3$ DCFO*CFO $+ \varepsilon$, Smooth is the Spearman correlation between the change in total accruals and the change in cash flows from operations for country i in year t $*-1$, Small is the logarithm of the bottom quartile total assets for country i in year t $*-1$, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

2. Alternative Accounting Factor

In addition to income smoothing, Leuz et al. (2003) focus on another aspect of earnings management. They call this aspect "discretion in reported earnings," namely, earnings management to "achieve certain earnings targets or report extraordinary performance in specific instances" (Leuz et al. 2003, 510). We use *Discretion* as an alternative accounting factor instead of *Smooth*. Following Leuz et al. (2003), *Discretion* in reported earnings is computed as the median ratio of the absolute value of TAC to the absolute value of CFO for each country-year.[9]

Previous studies find that firms overstate earnings to fulfill specific earnings benchmarks, for instance the avoidance of earnings decreases and losses (Burgstahler and Dichev 1997) or analyst forecasts (Brown 2001; Matsumoto 2002). Since both high-ranking and low-ranking firms possibly inflate earnings, we do not predict how *Discretion* is related to profitability dispersion. As shown in Table 10, the estimated coefficients on *Discretion* are negative and statistically significant at the 0.1 level. Our findings are robust to the measures of earnings management. When earnings management is pervasive, profitability dispersion tends to be small.

[9] Following Burgstahler and Dichev (1997), Leuz et al. (2003) use the ratio of "small profits" to "small losses" as another measure of accounting discretion to avoid losses. To compute this ratio reliably, at least five observations of small losses are required for a country to be included. Because some of our observations for each country-year do not meet this criterion, we do not adopt this ratio to measure discretion in reported earnings.

TABLE 10. REGRESSION RESULTS OF THE PDI USING ALTERNATIVE ACCOUNTING FACTOR

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)	0.000	0.00			0.018	0.89
Discretion	(?)	-1.278	-8.02***			-0.595	-2.97***
Small	(+)					0.118	7.17***
ΔGDP	(-)					0.228	0.36
Performance	(-)					-3.205	-4.22***
Cons	(?)	1.256	9.49***			1.386	6.98***
R-squared		0.740				0.760	

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: PDI is top decile ROA − bottom decile ROA for country i in year t, where ROA is defined as net income divided by beginning total assets, Conservatism is the estimated $\alpha 3$ for country i in year t from the equation: TAC $= \alpha 0 + \alpha 1$ DCFO $+ \alpha 2$ CFO $+ \alpha 3$ DCFO*CFO $+ \varepsilon$, Discretion is the median ratio of the absolute value of total accruals to the absolute value of cash flows from operations for country i in year t, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

3. Cash-flows Dispersion Index

Our results so far show that profitability dispersion is generated not only by accounting factors but also by economic factors. Here, we specifically focus on how economic factors cause the dispersion. Accounting profitability measures such as ROA reflect both real economic performance and the management's choice of accounting policy. If economic factors are associated with profitability dispersion, they expectedly have primary impacts on cash-flows-based profitability, which is hardly affected by accounting policies.[10] Therefore, we define the Cash-flows dispersion index (CDI) as follows.

$$CDI = Top\ Decile\ CFO/Assets - Bottom\ Decile\ CFO/Assets \quad (7)$$

The time-series behavior of the CDI for each country is presented in Figure 3. We can tell at a glance that real profitability has a tendency similar to that of the PDI (Figure 2). It is thereby suggested that the dispersion of accounting profitability is not derived only from accounting factors. Some economic factors also seem to affect the phenomenon. To analyze this in detail, we estimate the following regression:

$$CDI_{it} = \delta_0 + \delta_1 Small_{it} + \delta_2 \Delta GDP_{it} + \delta_3 Performance_{it} + \varepsilon_{it}, \quad (8)$$

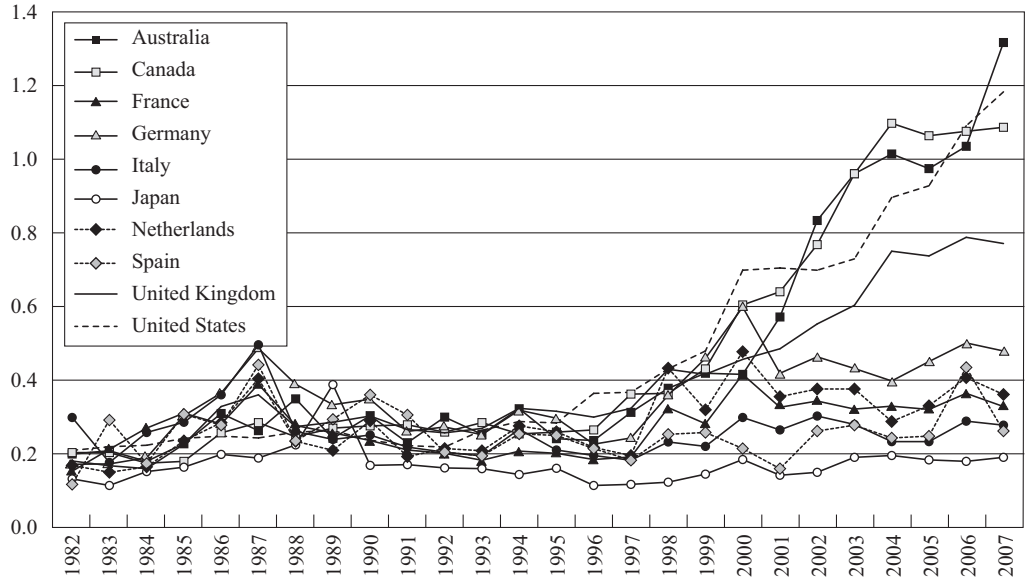
The variables are as defined earlier. Accounting factors (*Conservatism* and *Smooth*) are not

[10] We say "hardly" for two reasons. First, total assets, or the denominator of CFO/assets, may be affected by accounting factors. Second, TAC, which are estimated via the balance sheet approach, may be affected by measurement errors (Hribar and Collins 2002). Because we adopt this approach and define CFO as the difference between earnings and TAC, these errors may affect CFO, the numerator of CFO/assets.

included in the equation because they logically have no impact on cash flows. The regression results of equation (8) are presented in Table 11. The estimated coefficients on *Small* and *Performance* are statistically significant and the R-squared values are as high as 67.1 percent. These results are consistent with our original results using the profitability dispersion of ROA as the dependent variable.

Our results can be summarized as follows. Economic factors cause real profitability dispersion firstly. Then, accounting factors have additional effects on the dispersion. We confirm that accounting profitability dispersion derives from the product of economic fundamentals and earnings management behavior.

FIGURE 3. CASH FLOWS DISPERSION INDEX (CDI) OVER TIME



Note: Cash flows dispersion index (CDI) = Top Decile CFO/Assets − Bottom Decile CFO/Assets.

TABLE 11. REGRESSION RESULTS OF CDI

Independent Variable	Predicted Sign	Model 1 (Accounting Factors)		Model 2 (Economic Factors)		Model 3 (All Factors)	
		Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Conservatism	(?)						
Smooth	(?)						
Small	(+)			0.136	5.98***		
ΔGDP	(-)			2.361	3.53***		
Performance	(-)			-2.819	-4.27***		
Cons	(?)			1.026	7.98***		
R-squared				0.671			

Note: To control for both time-series and cross-sectional dependence, we use OLS with robust standard errors clustered by country and year (two-way clustering). ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. ***, **, and *: Significance at the 0.01, 0.05, and 0.10 level, respectively. Variable Definitions: CDI is top decile CFO/Assets − bottom decile CFO/Assets for country i in year t, Small is the logarithm of the bottom quartile total assets for country i in year t *−1, ΔGDP is the annual percentage change in real gross domestic product for country i in year t, and Performance is the median ratio of cash flows from operations to total assets for country i in year t.

VI. *Conclusion*

This study focuses on profitability dispersion in ten countries over the period 1982–2007. First, the level of profitability dispersion and its time-series behavior are presented. We find that in recent years, the dispersion has widened internationally; that the expansion began around 1997; and that common-law countries have experienced marked dispersion widening. Second, we investigate which factors cause the dispersion. Using aggregate data, we report evidence that profitability dispersion is significantly related to income smoothing, discretion in reported earnings, the presence of small firms, and macro firm performance. In other words, both accounting and economic factors influence the variability of profitability. These relations hold both in common-law and code-law countries. These results are almost robust to the definition of profitability dispersion, and the additional analysis using cash-flows-based dispersion reinforces our findings. As far as we know, this is the first study that finds a profitability dispersion-widening phenomenon around the world and investigates the determinants of it comprehensively. Our research contributes to the literature on international differences in earnings properties.

In addition, the paper has implications for practitioners. Regarding economic consequences for shareholders, pioneering work by Jorgensen et al. (2012) presents a positive relation between cross-section earnings dispersion and aggregate stock returns in the United States. Their study implies that analyzing PDI around the world is essentially useful for investors.

For regulators, we show that the presence of small firms is positively related to profitability dispersion. This association may highlight the economic consequences of relaxing (tightening) stock exchange listing requirements. Relaxing listing requirement attracts many small firms into the stock market, which provokes higher profitability dispersion. In contrast, tightening listing requirement conduce lower profitability dispersion. By taking our results into

consideration, policymakers can deliberate and predict the outcomes of their regulations.

Lastly, we discuss the limitations of the paper. Our research has at least two main limitations. First, owing to a lack of data, we use only one accounting conservatism measure. As mentioned in Section II, although conditional conservatism has been measured using Basu's (1997) regression model in many previous studies, we do not use it because the necessary data are not available for many listed firms included in this study. Therefore, the robustness test on the measure of conservatism is unfeasible in this paper. Next, our analyses do not control for the differences in industrial structures across countries. Previous studies such as McEnally (1976) and Nguyen (2007) investigate why the level of profitability dispersion differs by industry. If different countries have different industrial structures, inter-industry dispersion is assumed to influence inter-country dispersion. We leave the examination of this scholarly interesting topic for future research.

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