HOW MUCH DO INDUSTRY AND COUNTRY MATTER TO FIRM PERFORMANCE? A SUPRANATIONAL ANALYSIS

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HOW DO INDUSTRY AND COUNTRY IMPACT FIRM PERFORMANCE? A NATIONAL AND SUPRANATIONAL ANALYSIS

ABSTRACT

We contribute to the literature of the country, industry and firm effects on performance by developing an autoregressive cross-classified mixed-effect linear model that examines heterogeneity in the profitability of corporations in emerging and developed economies, as well as corporations located in different supranational regions. To this purpose, we simultaneously decompose abnormal returns into permanent and transitory components at the firm, industry, country and industry-country levels. We find that firms in emerging countries have significantly higher rates of performance persistence and different sources of persistence compared to firms located in developed countries. These differences are also evident between different supranational regions and countries at different levels of institutional depelopment.

Keywords: Performance, Hierarchical Linear Modeling, Emerging and Developed Economies, Competitive Structure.

INTRODUCTION

Scholars in the fields of strategic management and international business have documented that country, industry, and firm effects all explain the existence of performance heterogeneity among companies (Khanna and Rivkin, 2001; Henisz and Zelner, 2006; McGahan and Victer, 2010). Yet, with few recent exceptions (Bhattacharjeen and Majumdar, 2011; Karniouchina, Carson, Short and Ketchen, 2013; Majumdar and Bhattacharjeen, 2014), research has rarely addressed the relative importance of the transitory components of these three effects. This paper seeks to fill this gap by examining the firm, country, and industry effects on both the permanent and the transitory components of abnormal firm performance in firms headquartered in emerging and developed countries, as well as by identifying the "location effect" of specific supranational regions. We assess whether the dynamic influence of idiosyncratic industry and country effects on performance varies between emerging and developed economies and/or among different supranational regions, providing valuable insights for management scholars, business and public policymakers. Our findings help uncover the most promising theoretical lenses for explaining performance differences at the international level; they can also help managers at international firms focus their efforts in the pursuit of superior performance.

Numerous antecedents explore variance in firm performance in one or more countries and establish that firm profitability typically varies by firm, industry, and country (Chan, Isobe and Makino, 2008; Isobe, Makino and Chan, 2004; McGahan and Porter, 1997, 2002, 2003; McGahan and Victer 2010; Rumelt, 1991; Schmalensee, 1985). However, their estimation models do not account for the transitory component of the different effects, which limits the theoretical inferences that researchers can derive from the results and biases managerial and policy implications (Bou and Satorra, 2007, 2010; McGahan and Porter, 2002).

For example, the resource-based view looks into the nature of resources and capabilities to explain why a particular firm permanently differs in its performance regarding a reference set of similar competitors (usually called "the industry"). Dierickx and Cool (1989) argue that capabilities are stocks, while Barney (1991) suggests that if a firm is able to generate valuable, rare, and inimitable resources, it will obtain a fairly permanent differential performance. However, this stock analysis should be complemented by a flow analysis. Competition acts as a very strong force eroding competitive

advantages, and the speed of erosion might differ depending on the path dependence nature of these resources. Therefore, the observation of fairly stable differences in performance among firms mask two effects: a stock effect that refers to permanent resource differences and a flow effect that refers to partial erosion of these differences. That is, the stock effect lasts for many periods, while the flow effect only determines the rate of convergence between differences in performance. A failure to account for permanent and transitory components *simultaneously* masks the dynamic aspects of performance: companies not only differ in their permanent capability to generate competitive advantages, but also exhibit temporary differences – for instance, the speed with which they can protect their existing advantages or repeatedly generate new ones (Bhattacharjeen and Majumdar, 2011; Karniouchina, Carson, Short and Ketchen, 2013; Majumdar and Bhattacharjeen, 2014). Just measuring the permanent component would upward bias since it would also capture stable patterns of performance erosion.

We address this research question by developing an autoregressive cross-classified mixed-effect linear model that simultaneously estimates the permanent and transitory components of performance at the firm, industry, and country levels. In this model, differences in performance, defined as the difference in firms' ROA with respect to the mean, are modelled as long-term rents (i.e., permanent component), short-term rents (i.e., transitory component), and unexpected shocks. Our estimation overcomes some of the weaknesses of traditional regression methods, especially when the modelled effects are nested – for instance, firms nested in industries, countries or supranational regions (Hofmann, 1997; Hitt et al., 2007 and Peterson et al., 2012). By considering interclass correlations, we provide more consistent estimates than methods that assume complete independence within groups or levels. We also allow for the inclusion of explanatory variables at different levels, allowing us to include a transitory component, and can provide measures of effects and significance at each level. Additionally, while traditional ANOVA methods are sensitive to the order in which effects are introduced, our methods are not sensitive to the order of introduction since all effects are estimated simultaneously.

Our results indicate that a small but significant permanent component of abnormal returns exists in emerging economies; however, the transitory component accounts for most performance heterogeneity in emerging economies and in developed economies. We also observe that while only

the industry effect on the permanent component of abnormal returns is significant in developed economies, all industry, country, country-industry and firm effects are significant in emerging economies. In both types of economies, the firm effect is most important in explaining the differences in this component. In developed economies, the industry effect is second in importance, while in emerging economies, the country and country-industry effects take second place. The country and country-industry effects on both the permanent and transitory components are substantially larger for firms located in emerging countries, making industry structure and country characteristics significantly more relevant for competition in emerging economies than in developed ones.

We also compare two additional subsamples: countries with high and low institutional development. The results are largely consistent with those obtained by comparing developed and emerging markets. We note an even stronger country effect on the transitory component in countries with low institutional development (as compared to emerging economies). We take these results as supportive of the initial country classification, giving robustness to the analysis.

Finally, a comparison of emerging economies in Asia and Latin America shows that the importance of permanent and transitory components is similar across the two regions; however, country and industry-country effects play a more important role in Latin America. This difference is likely due to lower levels of commercial, financial and trade integration in Latin America; it also reflects greater heterogeneity at the institutional, political and macroeconomic level among Latin American countries.

Our study has important theoretical, managerial and policy implications. Theoretically, we find that competitive advantages at the firm, industry and country levels may create permanent differences in performance; however, most such differences are multi-year transitory phenomena, both in developed and emerging countries. Permanent advantages are more prominent in emerging countries than developed countries, suggesting the presence of larger barriers to competition and to the mobility of key competitive advantages and resources in emerging economies. The country-industry interaction effect is as important in explaining performance differences as the industry and country effects considered separately. Therefore, broader views of the business context are incomplete unless the roles of national industry clusters are taken into consideration. In developed countries, the

relatively low effect of the country and industry-country effects seems to indicate the significant integration and homogenization of business and economic policies and institutions. However, different industry structures and institutions do account for some of the permanent and transitory differences in performance in developed countries. From the public policy perspective, our results reinforce the need for governments in emerging countries to be clear about the existing country-industry strategy and also to reduce the country effects from spasmodic changes.

ANTECEDENTS

Scholars in strategic management have long examined the sources of performance heterogeneity (PH) among corporations in developed countries. Decades of analyses have concentrated primarily on the relative importance of industry factors (Bain, 1956; Mason, 1939; McGahan and Porter, 1999; Porter, 1985, 1990) vs. firm-specific factors (Barney, 1991; Dierickx and Cool, 1989; Peteraf, 1993). Recently, scholars have liberalized the context for study beyond the United States by considering how the locations of firms' headquarters influence their performance (McGahan and Victer, 2010). This approach allows for structural differences across national institutions that may systematically effect the performance of firms within a particular country, such as key-resources endowments, tax rates, industrialization policy, and labor costs (Feinberg and Gupta 2009; Ghemawat 2001; Ricardo, 1817). This line of research has the potential to yield insights on the role of country policy in influencing corporate performance. Despite the importance of country effects, relatively few studies have accounted for their impact on a decomposition of variance, in part because of data limitations.

Most antecedents have not distinguished between the permanent and transitory components of firm performance, based on the theory that the permanent component of performance is relatively more robust and important than transitory influences on profitability (McGahan and Porter 1999, 2005; Rumelt, 1991). In some analyses, transitory effects were subsumed into the error or were excluded from estimates of the permanent component through first differencing. The adjustment has the value of correcting biases in the estimates of the permanent components, but does so at the cost of masking dynamic processes.

The dynamics of change in the magnitude of various effects on performance have been modelled in a complementary but largely separate research stream focused on the degree of persistence of abnormal returns (Droucopoulos and Lianos, 1993; Geroski and Jacquemin, 1988; Glen, Lee and Singh, 2001;Goddard and Wilson, 1996; Jacobsen, 1988; Jenny and Weber, 1990; Kessides, 1990; Khemani and Shapiro, 1990; Kambhampati, 1995; McNamara et al., 2003; Mueller, 1986, 1991; Waring, 1996;). Most of these studies focused on the decay of performance using autoregressive models. In general, these analyses found that convergence to the industry mean was not complete, with abnormal returns persisting for several periods. These studies also found that the rate of convergence varied between firms and industries (McNamara, et al., 2003; Mueller, 1986; Waring, 1996). Further studies using non-parametric estimation techniques for measuring shocks to performance confirmed these results (Devan, Klusas et al. 2007; Wiggins and Ruefli 2002; Wiggins and Ruefli 2005). Finally, some of this research suggested that country factors were potentially more important determinants of corporate performance than industry or even firm-specific influences (Geroski and Jacquemin, 1988). Overall, studies of persistence in performance provided an important window into the evolution of performance, but relatively little specific insight into diversity in evolutionary paths at the firm level.

Two prior studies simultaneously accounted for the permanent and transitory components of abnormal returns: McGahan and Porter (1999) and Bou and Satorra (2007), each following different methods. McGahan and Porter (1999) estimated the persistence of the different components of performance (i.e., business-segment, corporate and industry effects). They found, in a sample of U.S. firms, that the temporary component of the industry effect persists longer (higher value) than the temporary component of the firm-specific effect. In contrast, Bou and Satorra (2007) focused on the sources of variation in the permanent and autoregressive components of performance. They found, in a sample of Spanish firms, that the latter are larger. In contrast to McGahan and Porter (1999), Bou and Satorra (2007) report varying rates of persistence in firm-specific and industry effects on performance.

Taken together, the existing research studies suggest that transitory effects persist at different rates and may accumulate into permanent components of performance. Effects arising at any level – firm, industry, or country — may result from actions taken at any level (McGahan and Porter, 2005; McGahan and Victer, 2010). For example, firm action shapes industry evolution (Porter, 1981). Thus,

a comprehensive understanding of the dynamics of corporate performance requires a detailed analysis of the transitory effects as well as an analysis of the permanent differences that may arise as companies seek superior returns, or as country and industry influences change.

Furthermore, prior studies suggest that transitory effects may vary substantially by country. Initial evidence indicates complex underlying relationships shaping the interactions between country and industry influences on performance (McGahan and Victer, 2010; Porter, 2003), with the effect of country affiliation on firm performance contingent on the industry in which the firm competes. For example, a country with a rich endowment of natural resources may favor the development of industries related to these resources, and thus support the emergence of country-industry effects for firms headquartered in the country and competing in the targeted sectors. In developing economies without strong institutional constraints on corporate behavior, the actions of firms may affect the institutional context and thus generate rents that comprise country-industry effects (Feinberg and Gupta, 2009).

Systematic evidence is needed to understand how country, industry and firm-specific effects on performance differ between developing and emerging countries. We fill this gap by applying comprehensive estimation and adapting it to our research questions.

MODEL AND METHODS

We follow a multistep process to develop a three-level hierarchical linear model (HLM). First, we propose a single-level general model in which we isolate the *permanent* and *transitory* components of the abnormal returns among the corporations that we study. Second, we then develop a three-level model to identify the *firm, industry, country, and industry-country effects* on the estimated permanent components. Third, we estimate *persistence* in the firm, industry, country, and industry-country effects on the transitory component.

The method by which we estimate the effects is hierarchical linear modeling (HLM). HLM methods overcome some of the weaknesses of traditional regression methods, especially when the modelled effects are nested (Hofmann, 1997; Hitt et al. 2007 and Peterson et al. 2012). This is because the decomposition of variance through ANOVA is sensitive to the order in which effects are introduced, whereas HLM methods are not sensitive to the order of introduction (all effects are

estimated simultaneously). By considering interclass correlations, HLM models provide more consistent estimates than methods that assume complete independence within groups or levels.

Single-level model: Permanent and Transitory Components of Abnormal Returns

Our conceptual focus is performance heterogeneity across firms. We measure performance as abnormal operating returns on the assets of the firm. We start with a general function expressing the autoregressive process shaping abnormal returns (Mueller, 1986; Geroski and Jaquemin, 1988; Waring, 1996; Glen et al. 2001).

$$R_{fict} = P_{fic} + T_{fict} \qquad t = 1, 2 \ldots T \qquad (1)$$

In equation (1), R_{fict} is the abnormal return defined as the difference between the ROA of firm *f* in industry *i* and country *c* at year *t* and the mean ROA across all firms at year *t* ($R_{fict} = ROA_{fict} - avg(ROA)_t$); P_{fic} is the permanent component of the abnormal return and T_{fict} is the transitory component of the abnormal return.

The *permanent component,* P_{fic}, accounts for the long-run sustainable differences between a firm's performance and the average performance of all firms, with "long-run" defined as the period of observation. Such differences could be the consequence of (i) resources and capabilities that translate into a persistent difference between the firm's performance and the global average; (ii) rents derived from structural industry characteristics, and (iii) characteristics of the country in which the company competes, such as the availability of key resources or institutional conditions.

The *transitory component,* T_{fict}, accounts for short-term differences in performance, which we define as abnormal returns that arise during the period under study but erode in the long run. The transitory component may be the consequence of (i) firm innovations that competitors imitate or overcome after a few years, (ii) rents that appear and disappear during the period of analysis due to changes in industry structure or (iii) temporary country differences such as short-lived growth, a macroeconomic crisis, or an institutional reform quickly imitated by other countries.

The fundamental characteristic of transitory abnormal returns is that they decay over time as a consequence of competition, the mobility of firms, and the movement of resources between industries and countries. Therefore, we adopt a first-order autoregressive process AR(1) to represent them.

$$T_{fict} = \beta_1 T_{fic(t-1)} + e_{fict} \qquad t = 1, 2 \ldots T \qquad (2)$$

where $|\beta_1| < 1$ and e_{fict}, accounts for the portion of firm profit that is not explained by the model and represents annual events or shocks. Substituting T_{fict} from equation (2) into (1) we re-express abnormal returns in the following way:

$$R_{fict} = P_{fic} + \beta_1 T_{fic(t-1)} + e_{fict} \qquad t = 1, 2 \ldots T \qquad (3)$$

The autoregressive form assumes that transitory differences in performance can be sustained from year to year but ultimately converge to the permanent component. The parameter β_1 indicates how much of the transitory abnormal return for the current year is explained by the previous year's transitory abnormal return. We assume that e_{cift} is not serially correlated and is uncorrelated with P_{fic} and $T_{fic(t-1)}$. The model can be easily extended to an autoregressive process of a higher order; we tested our data for evidence of a higher order autoregressive process and found no significance.

From equation (1) we have that $T_{fic(t-1)} = R_{fic(t-1)} - P_{fic}$ and substituting into (3) we obtain

$$R_{fict} = P_{fic} + \beta_1 (R_{fic(t-1)} - P_{Cif}) + e_{fict} = P_{fic}(1 - \beta_1) + \beta_1 R_{fic(t-1)} + e_{fict} =$$

$$= \beta_{0fic} + \beta_1 R_{fic(t-1)} + e_{fict} \qquad t = 1, 2 \ldots T \qquad (4)$$

From (4), we can estimate β_1, the average rate of persistence of the transitory component. P_{fic}, the permanent component, is obtained by regressing abnormal returns on the first lag of abnormal returns where $P_{fic} = \beta_{0fic}/(1 - \beta_1)$.

Three-level model: Firm, Industry, Country and Country-Industry Effects

To assess firm, industry, country and industry-country effects, we introduce two additional levels and a cross-classification to the model. The second level accounts for variation in permanent and transitory abnormal returns across firms. Since firms are clustered in industries and countries, we include a third level to account for variation in the permanent and transitory abnormal returns at industry and country clusters of firms. Because firms belong simultaneously to an industry and to a country, we include a country-industry cross-classification. Ignoring the country-industry dimension can seriously bias estimates due to ignored correlations between countries and industries. Additionally,

the country-industry effect may be interpreted as variation at the local industry level, while industry may be interpreted as variation at the global industry level.

In this model, the permanent component P_{cif} varies across firms, industries, countries, and country-industries. Thus β_{0cif} is expressed as a random intercept

$$\beta_{0fic} = \beta_{000} + v_f + v_i + v_c + v_{ci} \quad (5)$$

where β_{000} is a time-invariant fixed coefficient equal to the mean of intercepts in the population, while v_f, v_i, v_c, and v_{ci} are random effects that address the firm, industry, country and country-industry effects on the permanent component. We assume that the random effects are independent and identically distributed and independent of e_{fict} in expression (4).

In the same way, we allow β_1 to vary among firms, industries, countries and industry-countries as

$$\beta_1 = \beta_{100} + w_f + w_i + w_c + w_{ci} \quad (6)$$

where β_{100} is a time-invariant fixed coefficient equal to the grand mean of autoregressive coefficients of the population, while w_f, w_i, w_c, and w_{ci} are random effects of the country, industry, country-industry and firm-specific effects on the transitory component. Once again, we assume that the random effects are uncorrelated with each other and with e_{fict}.

With these definitions, we substitute (5) and (6) into (4) and express abnormal returns as

$$R_{fict} = \beta_{000} + v_f + v_i + v_c + v_{ci} + (\beta_{100} + w_f + w_i + w_c + w_{ci})R_{fic(t-1)} + e_{fict}$$

$$R_{fict} = \beta_{000} + v_f + v_i + v_c + v_{ci} +$$

$$\beta_{100}R_{fic(t-1)} + w_f R_{fic(t-1)} + w_i R_{fic(t-1)} + w_c R_{fic(t-1)} + w_{ci} R_{fic(t-1)} +$$

$$e_{fict} \qquad t = 1, 2 \ldots T \quad (7)$$

Equation (7) indicates that abnormal returns can be decomposed into several terms. The permanent component is represented by a fixed coefficient β_{000} that indicates the average abnormal return intercept of the population and a random component $v_f + v_i + v_c + v_{ci}$ that corresponds to the firm, industry, country and country-industry effects on the intercept. The transitory component in this model is composed of a fixed component $\beta_{100}R_{fic(t-1)}$, where β_{100} is the mean autoregressive

coefficient of the population, and a random component $w_f R_{fic(t-1)} + w_i R_{fic(t-1)} + w_c R_{fic(t-1)} + w_{ci} R_{fic(t-1)}$ that accounts for variation in the transitory component at the firm, industry, country and country-industry levels, and an unexplained component e_{fict}.

We estimate the model using an autoregressive cross-classified mixed-effect linear model, which is part of the family of hierarchical linear models (HLM). The model is cross-classified because firms are simultaneously nested in country and industry groups. The model is mixed-effect because it has fixed ($\beta_{001} and\ \beta_{100}$) and random effects ($v_c; v_i; v_{ci}; v_{cif}; w_c; w_i; w_{ci}; w_{cif}$) as well as the common error term, e_{fict}. We obtain estimates of β_{000} and β_{100} and their standard errors; however, the random coefficients $v_f, v_i, v_c,\ v_{ci}, w_f,\ w_i, w_c$ and w_{ci} are not estimated directly. We only obtain estimates of the variance and standard errors of these effects.

To assure that our results are not sensitive to the nesting order, we obtained results from two different models: one nested at the country level and one nested at the industry level. Results were very similar so we only report the result nested at the country level.

Data and Sample

We followed the standard approach for analyzing performance using firms' annual Return on Assets (ROA). We gathered accounting information for all listed companies in the North American and Global Compustat databases from 2000 to 2007. We defined industries using the SIC system at the four-digit level. Following Fama and French (1997), we assigned companies to 48 industries. This industry classification is designed to yield a manageable number of distinct industries covering the different stock markets (Fama and French, 1997).

The original sample includes all of the companies listed in the financial markets of 105 countries, with 228,609 observations for 37,978 firms in 47 industries. However, we were compelled to reduce the sample size to satisfy several requirements. All firms missing four out of any five continuous years of information were excluded. This exclusion ensured that results would not be affected by temporary entities established for the dispensation of assets and other transitory phenomena (McGahan and Porter, 1997). We eliminated all firms with missing data for our key variables. We concentrated on data from all industries in four different supranational regions (Asia,

Europe, Latin America, and North America), excluding firms in the financial services and defense industries. In order to obtain a better assessment of the different components of variance, we excluded any subject with less than three nested observations. Finally, we eliminated observations in which the ratio of net profit loss to equity was higher than 1. After these adjustments, the sample size diminished to 102,434 observations for 20,447 firms in 42 industries and 49 countries. Table 1 reports some descriptive statistics such as the number of observations for each industry in each region, the mean, the standard deviation and the median ROA.

*** Insert Table 1 about here ***

Countries with a very low level of economic development were excluded from the sample due to a lack of accounting information. Following the United Nations classification, we grouped countries into two broad categories: developed and emerging.

RESULTS

Table 2 provides the results for the global sample. On top it reports the fixed coefficient estimates while below it reports the random coefficient variance and the composition of variance as a percentage of the total variance. Most important is the firm-specific effect (47%). The interaction industry-country effect is 3%, followed by the industry (2%) and country effects (2%). The autoregressive coefficient β_{100} is significant (.597) and indicates that 59% of ROA at *t* remains in ROA at *t*+1. There is also a small but significant permanent abnormal return of 1%.

*** Insert Table 2 about here ***

These results are consistent with antecedents in the literature (Brito and Vasconcelos, 2006; Makino et al., 2004; McGahan and Victer, 2010). However, it is worth noting that the industry, country, and industry-country effects in our sample are smaller in magnitude that those found in prior studies. We address this issue below.

Testing Permanent and Transitory Components in Developed and Emerging Economies

In order to analyze the permanent and transitory components of firm performance in more detail, we divided the full sample into developed and emerging economies. Table 3 reports results. All of the fixed and random effects estimates are significantly different from zero. The fixed permanent coefficient β_{000} is significantly larger than zero in emerging economies; in developed economies, it is

not different from zero. Additionally, the PH variation in the permanent component is more important for firms competing in emerging economies than for firms competing in developed countries (4% vs. 1%).

*** Insert Table 3 about here ***

In both emerging economies and developed ones, the transitory fixed coefficients β_{100} are significantly larger than zero; however, they are not significantly different between the two subsamples. The autoregressive coefficient indicates the persistence of abnormal performance, or the percentage of a given year's abnormal performance that the company replicates in the following year. Said differently, it captures the idiosyncratic actions that allow the firm to sustain its performance. The coefficient estimates indicate that 59.4 % of ROA at *t* remains in ROA at *t*+1 for firms competing in developed countries and 58.7 % remains for firms competing in emerging economies. These values are higher than the results for emerging economies obtained by Glen, Lee, and Singh (2003), which range between 0.01 and 0.42, but similar to the values obtained for India in prior studies (Chacar and Vissa, 2005; Khambhampati, 1995). Table 4 provides a list of previous estimates for the autoregressive coefficient by country.

*** Insert Table 4 about here ***

We can conclude that firms in both emerging and developed economies can sustain abnormal returns transitorily; however, only firms in emerging economies seem to be able to achieve permanent abnormal returns, albeit small ones.

Testing Effects on Permanent and Transitory Performance Heterogeneity in Developed and Emerging Countries

We next analyzed the industry, country, and industry-country effects on the permanent component of performance for firms competing in developed and emerging countries. Table 3 shows that the magnitude of the industry effect is 1% in both subsamples. The country effect on the permanent component is 1% for firms competing in emerging economies and not significantly different from zero in developed economies. The inclusion of the industry-country effect reinforces some marginal differences.

Next, we investigated the variance decomposition of the transitory component. The firm-specific effect on the transitory component is much more important in developed countries (53%) than in emerging economies (47%). The country and industry-country effects on the transitory component are more important for emerging economies (5 % and 5 % respectively) than for developed countries (1 % and 1 % respectively). The industry effect on the transitory component is slightly more important for developed countries (2 %) than for emerging economies (1%).

These results suggest that, in both developed and emerging economies, firm-specific actions are the most important levers for improving performance; in emerging economies, the country and country-industry contexts also have a somewhat substantial role.

Analysis by Region

To further examine industry and country effects by region, we organize our sample into four supranational regions: two regions with emerging economies (Asia and Latin America), and two developed regions (North America, including the USA and Canada, and Europe). Table 5 summarizes the results.

The fixed constant estimates are significantly larger in Asia and Latin America than in the developed regions, but not significantly different between the two emerging regions. The fixed autoregressive coefficient is larger in North America than the other regions (0.62 vs. 0.57-0.59), however, this difference is not statistically significant. Consistent with the above analysis, the industry effect is slightly higher in North America and Europe (1% and 2% for the permanent and transitory components, respectively) than Latin America and Asia (1% for both the permanent and transitory components in both regions). In contrast, the country and country-industry effects increase in importance in Asia regarding North America and Europe (3.3% and 5.1% respectively), reaching the highest levels for the transitory component in Latin America (13.8% and 8.5% respectively). Therefore, local conditions at the country and industry-country level are significantly more important in regions with a larger proportion of emerging economies. Asia and Latin America present different results in terms of permanent and transitory components than Europe and North America. The former present a larger permanent component than the latter. However, the permanent component only

explains between 1% and 4% of the total variance in performance across all four regions; therefore, most of the variance in both subsamples is explained by the transitory component.

*** Insert Table 5 about here ***

A comparison of results from Asia and Latin America shows similar levels of importance for permanent and transitory components; however, the importance of country and industry-country effects in Latin America is relatively larger. This is probably a consequence of lower levels of commercial, financial and trade integration in Latin America as compared to Asia. Results also emphasize more country heterogeneity in Latin America, where countries present larger institutional, political and macroeconomic differences.

Analysis by Institutional Development

Finally, in order to better understand the impact of institutional development on performance persistence and profit heterogeneity, we organized countries into two subsamples according to their level of institutional development.

To define levels of institutional development, we used institutional variables from the Worldwide Governance Indicators (WGI) produced by Kaufmann and Kraay from the Natural Resource Governance Institute (NRGI) and the Brookings Institution, and the World Bank Development Research Group, respectively (Worldeide Governance Indicators, 2016). These indicators describe both traditional and formal institutional factors, aggregated into six dimensions of governance: 1) Voice and Accountability (va), 2) Political Stability and Absence of Violence and Terrorism (ps), 3) Government Effectiveness (ge), 4) Regulatory Quality (rq), 5) Rule of Law (rl) and 6) Control of Corruption (cc). They are based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. We created an overall institutional development index using the principal components of the six institutional indicators. Using this index, we divided the sample into two subsamples (countries with institutional development above and below the sample median). Results are presented in Table 6.

*** Insert Table 6 around here ***

All of the fixed and random effects estimates are significantly different from zero. The fixed permanent coefficient β_{000} is significantly larger than zero in countries with lower institutional development; in countries with higher institutional development, it is not significantly different from zero. Similarly, the permanent component of PH variation is more important in countries with lower institutional development than in countries with higher institutional development (5% vs. 1%). Therefore, abnormal returns are more stable under poorer institutional conditions.

The transitory fixed coefficients β_{100} are significantly larger than zero in both subsamples, but are not significantly different between the two. Additionally, the transitory component of the PH variation is more important for firms competing in countries with higher institutional development than in those with lower development (53% vs. 46%). Therefore, differences in abnormal performance are possible in both institutional settings, but are of a more temporary nature in developed institutional settings than in countries with less developed institutions. Given the effect of institutional conditions on the development of markets, conditions of access to resources, abuse of market power, or privileged political and regulatory conditions, investment and business opportunity development is more restricted when institutions are lacking, reducing competitive dynamics and giving a more permanent character to differences in performance.

The country effect and the country-industry effect are more important for both the permanent and transitory components in countries with poorer institutional conditions, while the firm effect is relatively more important in countries with better institutions. As institutions improve, firms become more dependent on their own capabilities and less dependent on the local country and country-industry conditions.

DISCUSSION AND CONCLUSIONS

In this paper, we seek to identify the factors that give rise to PH, and specifically to point to systemically observable differences in the persistence of abnormal returns at the firm, industry and country effects. Our model attributes PH to long-term influences, short-term influences, and to unexplained within-year variation. We found that transitory sources of PH are more important than permanent ones. We also observed that firm effects are the primary factor in explaining PH in both emerging and developed countries. Additionally, even though they are relatively less important,

permanent industry and country effects account for a significant portion of differences in profitability. In addition, industry structure accounts for a larger amount of the permanent component of abnormal returns in developed countries. Finally, country characteristics account for a larger transitory component of PH in emerging economies.

Our Findings in Perspective

Although our empirical results are in line with antecedents in the literature, they differ in some aspects bringing new evidence from different sample periods. Additionally, they are more robust than previous research since we simultaneously estimated permanent and transitory components. Our values for the autoregressive coefficients are larger than antecedents' estimates for emerging economies and similar to prior estimates for developed countries (Table 4). These differences are likely the result of our sample period. We used data from 2000-2007, a period characterized by rapid economic growth worldwide. It seems that these macroeconomic conditions stimulate increasing and stable returns. In fact, previous studies focused on periods of higher economic growth (e.g., a sample from the 1990s) yield higher coefficients than those investigating periods of lower economic growth and higher volatility (e.g., sample from the 1980s). Our results emphasize the need for future studies to analyze persistence during longer periods of time.

Table 7 describes the results of previous research that performs multi-country PH variance decompositions. We find a higher firm effect and slightly lower industry, country, and country-industry effects than those of Makino, Isobe and Chan (2004) and Brito and Vasconcelos (2006).

*** Insert Table 7 about here ***

Our sample differs from that from Makino, Isobe and Chan (2004) in two ways. First, we originally include firms from all over the world, while Makino, Isobe and Chan (2004) only include business units of Japanese multinationals. Additionally, our sample period is almost contiguous to the period analyzed by Makino, Isobe and Chan (2004): 2000-2007 vs. 1996-2001, respectively. Since variation in firm origin is much higher in our sample, it follows that the firm effect should be higher as well, suggesting that Makino, Isobe and Chan (2004) could have slightly overestimated the relative variance at the coutry and inutry levels. The difference in time periods studied may also play a role. In spite of these differences, we confirm Makino, Isobe and Chan's (2004) finding that the country,

industry and country-industry effects are inversely correlated with the level of a country's development. In other words, both studies confirm that firms in emerging economies are significantly more exposed to local conditions than firms in developed economies.

As for Brito and Vasconcelos (2006), our samples are similar in terms of diversity in country of origin: both come from Compustat Global and differ mostly in the sample period. Brito and Vasconcelos (2006) cover 5 years – from 1997 to 2001 – while our sample covers 8 years, from 2000 to 2007. The most important difference between the studies' results is the magnitude of the country-industry effect, which is larger in our study. However, our results are in the range of select industry-specific estimates obtained by Brito and Vasconcelos (2006). This would suggest that measurements of the country-industry effect may be very sensitive to the industries included in the sample.

McGahan and Victer's (2010) estimates of the same effects are significantly different from ours; they also differ from Makino, Isobe and Chan (2002) and Brito and Vasconcelos (2006). The magnitude of McGahan and Victer's (2010) country effect is similar to the other three studies, but their country-industry and industry effects are much larger than those of the others. Unfortunately, comparing results from McGahan and Victer (2010) to the rest is not straightforward, since they used a very different estimation method. However, we are confident that our estimation methods result in more robust results than the method employed by McGahan and Victer (2010), which are sentsitive to to the order of introduction. Idenepdently of the method, it is worth noting that in all of these studies, including ours, the country-industry effect is more important than the industry and country effects taken separately.

Our results are also consistent with Majumdar and Bhattacharjeen (2014). Both studies come to the same conclusion: the better the institutional conditions, the less important the industry or country-industry effect and the more important the firm effect. As institutions improve, markets develop, and regulatory and political privileges decrease, firms must rely more and more on their own competitive advantages. Countries also become more open, increasing competition and the flow of firms, technology and business ideas.

Theoretical Implications

Although our methodology does not permit conclusive inferences about the sources of PH (McGahan and Porter, 2005), our study serves as a valuable interim step in illuminating potential mechanisms. Based on our results, we point to several theoretically important relationships.

First, our results indicate that a small but significant permanent component of abnormal returns exists mostly in emerging economies, both in Asia and Latin America. From a theoretical standpoint, this means that firms in emerging economies have a better chance of creating long-term competitive advantages, leading to permanent abnormal returns and rents. The source of these permanent differences is unclear, since the firm, industry, country, and country-industry effects are equally important in explaining variation in the permanent component. Therefore, firms' asymmetric capabilities, industry structures, and country characteristics all contribute to persistent differences in performance.

Second, the dynamics leading to transitory persistence in short-term rents are the most important factor in profitability. In managerial terms: in both emerging and developed economies, profitability crucially depends on transforming short-term events that boost profits into multi-year opportunities. Theoretically, these results point towards the need to understand and enhance the capability to constantly improve competitive advantages and create new ones, since most sources of advantage will likely erode completely after 5 to 6 years.

Third, for the transitory, short-term component of abnormal performance, firm-specific effects largely dominate other effects. This suggests that theories focusing on firm-specific activities to generate short-term rents are among the most relevant in explaining PH (Wiggins and Ruefli, 2002, 2005). The managerial implication is that strong performance is possible in a range of industries and countries. Performance is extremely sensitive to short-term opportunities that the firm capitalizes on but that its direct industry rivals and country peers do not pursue. One challenge is that low performance arises the same way – i.e., among firms that respond to short-term events differently from their industry competitors and country peers.

Of course, this does not mean that industry and country effects are unimportant. Our analysis indicates that persistent and transitory differences in firm performance arise at industry, country and

country-industry levels. In some industries and countries, transitory events may have either positive or negative multi-year consequences that significantly affect the performance of the firms competing in those contexts. Furthermore, the role of industry and country effects varies systematically by region, and is especially strong in Latin America. The implications for managerial and public policies are substantial: business leaders, regulators, and legislators seeking to influence company performance may find levers in industry and country contexts. This point is especially valuable because persistence in the transitory component of an industry or country effect may reflect the emergence of the effect as well as its decay. Inciting a multi-year transitory effect may be an important tool for development.

We conjecture that in emerging economies, transitory industry effects that are coming to an end are being 'replaced' by emerging effects in other industries. In other words, the process of economy emergence involves both the decay of old effects and the emergence of new ones. Karniouchina et al., (2013) found that the stage of the industry life cycle matters in variance decomposition. Specifically, Karniouchina et al (2013) found that the proportion of variance explained by firm, industry and country effects changes across various stages of the industry life cycle.

It can be argued that the development of institutions in a country matters to variance decomposition. Our approach helps reconcile theoretical developments (North, 1990) with empirical findings (Chan, Isobe and Makino, 2008; Diaz Hermelo and Vassolo, 2010). Institutions might have a double effect. On one hand, underdeveloped institutions favor lower levels of rivalry, creating the environmental conditions for higher persistent effects on PH. We observe this effect in the analysis of the permanent component of performance. On the other hand, institutions tend to instigate transitions. Therefore, the effect of institutional development on the levels of firm, industry, country, and country-industry effects is ambiguous. However, the implications for persistence are clear: in emerging contexts, variation in the institutional environment leads to persistent differences in both the permanent and the transitory components of performance. Additional research is needed to understand the opportunities for public policy makers that result from these regularities.

Our analysis is consistent with prior research suggesting that institutional influences might not necessarily follow a linear trend from higher levels of discretional intervention to more stability, as manifest in persistent effects. Majumdar and Bhattacharjee (2014) observe oscillations in the

influences of institutions in India throughout the 1980-2006 period. They also detect that these changes alter the relative importance of the industry and country effects. This regularity points to interventions that may be designed to prevent convergence. That is, it is possible for Asia and Latin America to avoid moving to the North American institutional model.

An important corollary of this analysis is that firms adapt fairly well to country-specific permanent characteristics, developing adequate strategies and resources to survive in their environment. However, they find it more difficult to counterweigh volatility and the sudden economic and political changes that generate short-term shocks. The implications for both business and public policy are extensive as executives and government officials seek opportunities for cultivating persistence in desired transitory effects.

Limitations and Future Research

Our research presents several limitations. We assigned each company in our sample to a single country and industry; however, some companies may operate in multiple countries or industries, thus reducing these effects. For simplicity, we only consider autoregressive components of the first order. Even though we found no significance for higher order and we are following several antecedents in the literature in favor of an autoregressive behavior of abnormal returns (e.g., Bou and Satorra, 2007; Glen et al. 2003; McGahan and Porter, 1999; Mueller, 1990; Waring, 1996), it might also be important for future studies to examine other time patterns. Another potential limitation relates to the existence of different accounting rules among countries, which might artificially increase the country effect.

In spite of these limitations, our study provides an important contribution by distinguishing between permanent and transitory components of abnormal performance in different types of economies and supranational regions (McGahan and Porter, 2002) and incorporating level analysis and HLM methods into an important line of international business research (Hofmann, 1997; Hitt et al. 2007 and Peterson et al. 2012). Future research should expand the analysis and attempt to incorporate specific covariates to the regressions at different levels in order to obtain a fine-grained explanation of the causality behind PH, for which HLM techniques are especially suited. We hope that our study acts as a solid foundation towards these future studies.

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Table 1: Descriptive Statistics

							Corporate ROA		
Industry	**N**	**Asia**	**Europe**	**LATAM**	**NorAm**	**UK**	**Mean**	**Standard Error**	**p50**
Agriculture	162	91	17	13	28	13	1.0%	1.0%	3.0%
Aircraft	52	3	10		34	5	2.0%	1.0%	4.0%
Apparel	332	144	59	13	96	20	2.0%	1.0%	4.0%
Autos & Trucks	432	259	48	8	101	16	3.0%	0.0%	4.0%
Beer & Liquor	148	45	45	8	31	19	3.0%	1.0%	4.0%
Business Service	2,533	486	537	11	1,070	429	-5.0%	0.0%	0.0%
Business Supplie	306	128	68	12	83	15	2.0%	0.0%	2.0%
Candy & Soda	28	5		5	15	3	-1.0%	3.0%	4.0%
Chemicals	762	469	89	27	149	28	2.0%	0.0%	3.0%
Coal	53	24			21	8	2.0%	2.0%	5.0%
Communication	633	154	107	46	272	55	-4.0%	1.0%	0.0%
Computers	874	315	189	3	305	62	-4.0%	0.0%	0.0%
Construction	524	271	110	15	77	51	2.0%	0.0%	3.0%
Construction Mat	784	413	147	30	152	42	2.0%	0.0%	3.0%
Consumer Goods	453	226	67	13	108	39	2.0%	0.0%	3.0%
Electrical Equip	392	205	58	4	105	22	0.0%	1.0%	3.0%
Electronic Equip	1,347	683	143		449	72	-1.0%	0.0%	2.0%
Entertainment	393	68	77	3	154	91	-3.0%	1.0%	0.0%
Fabricated Produ	101	49	17	3	28	4	2.0%	1.0%	3.0%
Food Prods	674	373	111	35	121	34	3.0%	0.0%	4.0%
Healthcare	200	32	23	3	129	13	0.0%	1.0%	2.0%
Machinery	817	316	202	10	229	60	1.0%	0.0%	3.0%
Measurement & Co	269	56	41		151	19	-2.0%	1.0%	3.0%
Medical Equipmen	393	29	69		262	33	-9.0%	1.0%	-2.0%
Mines	377	41	13	11	228	84	-11.0%	1.0%	-10.0%
Personal Service	147	23	12		88	24	0.0%	1.0%	2.0%
Petroleum & Natu	801	116	71	4	524	86	0.0%	0.0%	3.0%
Pharmaceutical P	943	269	125		475	78	-14.0%	1.0%	-7.0%
Precious Metals	196	9	5		148	34	-12.0%	1.0%	-10.0%
Printing & Publi	209	54	54	3	66	32	1.0%	1.0%	3.0%
Recreation	169	69	24	3	59	14	-2.0%	1.0%	1.0%
Restaurants & Ho	384	117	35		163	69	1.0%	0.0%	2.0%
Retail	856	200	140	31	379	106	2.0%	0.0%	3.0%
Rubber & Plastic	295	159	33		83	20	1.0%	1.0%	3.0%
Shipbuilding & R	51	20	16		13	2	4.0%	1.0%	4.0%
Shipping Contain	76	42	9	3	18	4	3.0%	1.0%	3.0%
Steel Works	615	377	79	34	112	13	3.0%	0.0%	4.0%
Textiles	370	283	40	8	28	11	1.0%	0.0%	2.0%
Tobacco Products	17	10			7		9.0%	2.0%	11.0%
Transportation	737	291	161	22	198	65	2.0%	0.0%	4.0%
Utilities	638	141	78	78	320	21	3.0%	0.0%	3.0%
Wholesale	904	371	160	2	296	75	1.0%	0.0%	3.0%
Total	20,447						-1.0%	0.0%	2.0%

Table 2: Permanent and Transitory Components - Global

Fixed Effects

	Value
Transitory β_{100}	0.597***
	(0.010)
Constant β_{000}	0.005**
	(0.002)

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0001	0.0031		0.0032	0.3%	2.0%		2.3%
	0.00002	*0.0015*						
Industry	0.0001	0.0022		0.0023	0.5%	1.4%		1.9%
	0.00003	*0.0008*						
Country-Industry	0.0001	0.0039		0.0040	0.3%	2.5%		2.9%
	0.00001	*0.0008*						
Firm	0.00003	0.0723		0.0723	0.1%	46.4%		46.5%
	0.00005	*0.0019*						
Residual			0.0096	0.0096			46.4%	46.4%
			0.0001					
Total	0.0003	0.0109	0.0096	0.0208	1.3%	52.3%	46.4%	100.0%

Standard errors appear beneath coefficient estimates.
† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001

Table 3: Permanent and Transitory Components by Economic Development

Developed Countries

Fixed Effects

	Value
β_{100}	0.594 ***
	0.012
Constant	0
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.00004	0.0015		0.0016	0.2%	1.0%		1.1%
	0.00002	*0.0013*						
Industry	0.0002	0.0033		0.0035	0.8%	2.2%		2.9%
	0.0001	*0.0012*						
Country-Firm	0.00003	0.0018		0.0019	0.1%	1.2%		1.3%
	0.00001	*0.0009*						
	0.00000	0.0752		0.0752	0.0%	49.1%		49.1%
	0.00000	*0.0025*						
Residual			0.0123	0.0123			45.6%	45.6%
			0.0001					
Total	0.0003	0.0144	0.0123	0.0270	1.0%	53.4%	45.6%	100.0%

Emerging Economies

Fixed Effects

	Value
β_{100}	0.587 ***
	0.010
Constant	0.011 ***
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0001	0.0074		0.0075	1.1%	4.8%		5.9%
	0.0001	*0.0057*						
Industry	0.0001	0.0008		0.0009	0.6%	0.5%		1.1%
	0.00002	*0.0008*						
Country-Firm	0.0001	0.0072		0.0073	0.6%	4.7%		5.2%
	0.00001	*0.0016*						
	0.0002	0.0566		0.0568	1.6%	36.6%		38.2%
	0.00004	*0.0026*						
Residual			0.0055	0.0055			49.7%	49.7%
			0.0001					
Total	0.0004	0.0052	0.0055	0.0111	3.8%	46.5%	49.7%	100.0%

Standard errors appear beneath coefficient estimates.

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001

Table 4: Persistence Rate of Transitory Abnormal Returns for Several Countries

Country	Study	year	Sample period	Number of firms	Number of years	Sample mean persistence
Developed countries						
Canada	Khemani and Shapiro	1990	1964–82	189	19	0.43
France	Geroski and Jacquemin	1988	1965–82	55	18	0.41
France	Jenny and Weber	1990	1965–82	450	18	0.37
Germany	Geroski and Jacquemin	1988	1961–81	28	21	0.41
Germany	Schohl	1990	1961–81	283	21	0.51
Germany	Schwalbach, Graβhoff and Mahmood	1989	1961–82	299	22	0.49
Japan	Maruyama and Odagiri	2002	1964–97	357	34	0.54
Japan	Odagiri and Yamawaki	1986	1964–82	376	19	0.47
Japan	Yamawaki	1989	1964–82	376	19	0.49
Spain	Boun and Satorra	2007	1995–00	5000	6	0.64
UK	Cubbins and Geroski	1990	1948–77	239	30	0.48
UK	Geroski and Jacquemin	1988	1947–77	51	29	0.49
UK	Goddard and Wilson	1999	1972–91	335	20	0.45
US	Chacar and Vissa	2005	1989–99	4562	11	0.39
US	Choi and Wang	2009	1991–01	518	11	0.55
US	Jacobson and Hansen	2001	1988–92	1039	5	0.37
US	McGahan and Porter	1999	1981–94	4488	14	0.54
US	Mueller	1990	1950–72	551	23	0.18
US	Waring	1996	1970–89	12,986	20	0.54
US	Yamawaki	1989	1964–82	413	19	0.48
Emerging Economies						
Brazil	Glen, Lee and Singh	2003	1985–95	56	11	0.01
India	Chacar and Vissa	2005	1989–99	4325	11	0.50
India	Chari and David	2011	1991–07	5492	17	0.41
India	Glen, Lee and Singh	2003	1982–92	40	11	0.23
India	Khambhampati	1995	1970–85	42	16	0.48
Jordan	Glen, Lee and Singh	2003	1980–94	17	15	0.35
Korea	Glen, Lee and Singh	2003	1980–94	82	15	0.32
Malaysia	Glen, Lee and Singh	2003	1983–94	62	12	0.35
Mexico	Glen, Lee and Singh	2003	1984–94	39	11	0.22
South Korea	Glen, Lee and Singh	2003	1980–94	82	15	0.32
Turkey	Yurtoglu	2004	1985–98	172	14	0.38
Zimbabwe	Glen, Lee and Singh	2003	1980–94	40	15	0.42
Latin America	Diaz Hermelo, Etiennot and Vassolo	2014	1991-05	806	15	0.48

Table 5: Permanent and Transitory Components – Supranational Regions

Asia – Emerging Economies

Fixed Effects

	Value
β_{100}	0.589 ***
	0.010
Constant	0.011 ***
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0002	0.0027		0.0028	1.4%	1.9%		3.3%
	0.0001	*0.0015*						
Industry	0.0001	0.0008		0.0008	0.5%	0.5%		1.1%
	0.00002	*0.0008*						
Country-Industry	0.0001	0.0065		0.0066	0.5%	4.5%		5.1%
	0.00001	*0.0016*						
Firm	0.0002	0.0574		0.0576	1.6%	39.8%		41.4%
	0.00004	*0.0027*						
Residual			0.0055	0.0055			49.2%	49.2%
			0.0001					
Total	0.0005	0.0053	0.0055	0.0113	4.1%	46.7%	49.2%	100.0%

Latin America – Emerging Economies

Fixed Effects

	Value
β_{100}	0.566 ***
	0.034
Constant	0.012 ***
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0001	0.0406		0.0407	1.1%	12.7%		13.8%
	0.0002	*0.0083*						
Industry	0.0001	0.0000		0.0001	1.1%	0.1%		1.1%
	0.00012	*0.0000*						
Country-Industry	0.0000	0.0263		0.0264	0.3%	8.2%		8.5%
	0.0001	*0.0124*						
Firm	0.0001	0.0963		0.0963	1.0%	30.1%		30.1%
	0.0002	*0.0625*						
Residual			0.0053	0.0053			45.5%	45.5%
			0.0002					
Total	0.0003	0.0059	0.0053	0.0115	3.5%	51.0%	45.5%	100.0%

Table 5: Permanent and Transitory Components – Supranational Regions (Continued)

Europe – Developed Countries

Fixed Effects

	Value
β_{100}	0.575 ***
	0.017
Constant	0.005 *
	0.002

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0000	0.0029		0.0030	0.2%	1.7%		1.9%
	0.0000	*0.0026*						
Industry	0.0001	0.0038		0.0039	0.6%	2.2%		2.9%
	0.00003	*0.0019*						
Country-Industry	0.0000	0.0033		0.0033	0.0%	2.0%		2.0%
	0.0000	*0.0026*						
Firm	0.0000	0.0651		0.0651	0.0%	38.9%		38.9%
	0.0000	*0.0046*						
Residual			0.0093	0.0093			54.4%	54.4%
			0.0001					
Total	0.0001	0.0076	0.0093	0.0170	1%	45%	54%	100%

North America – Developed Countries

Fixed Effects

	Value
β_{100}	0.615 ***
	0.014
Constant	-0.01 **
	0.004

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0000	0.0002		0.0002	0.1%	0.1%		0.2%
	0.0000	*0.0007*						
Industry	0.0002	0.0028		0.0030	0.7%	2.0%		2.7%
	0.0001	*0.0021*						
Country-Industry	0.0001	0.0031		0.0032	0.3%	2.2%		2.4%
	0.0000	*0.0023*						
Firm	0.0000	0.0746		0.0746	0.0%	51.7%		51.7%
	0.0000	*0.0032*						
Residual			0.0133	0.0133			43.0%	43.0%
			0.0001					
Total	0.0003	0.0173	0.0133	0.0309	1%	56%	43%	100%

Standard errors appear beneath coefficient estimates.

† p < 0.1; * p < 0.05; ** p < 0.01; *** p < 0.001

Table 6: Permanent and Transitory Components by Institutional Conditions

Lower 50% Institutional Conditions

Fixed Effects

	Value
β_1	0.57 *
	0.011
Constant	0.011 ***
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.000	0.011		0.011	1.6%	6.5%		8.0%
Industry	0.000	0.001		0.001	0.6%	0.6%		1.2%
Country-Industry	0.000	0.007		0.007	0.7%	3.9%		4.6%
Firm	0.000	0.061		0.061	2.0%	35.1%		37.1%
Residual			0.005	0.005			49.1%	49.1%
Total	0.001	0.005	0.005	0.011	4.9%	46.1%	49.1%	100.0%

Upper 50% Institutional Conditions

Fixed Effects

	Value
β_1	0.602 ***
	0.012
Constant	0.002
	0.003

Random Effects

	Permanent	Transitory	Residual	Total	Permanent	Transitory	Residual	Total
Country	0.0000	0.0026		0.0026	0.2%	1.7%		1.8%
Industry	0.0002	0.0029		0.0030	0.7%	1.9%		2.6%
Country-Industry	0.0000	0.0035		0.0035	0.2%	2.3%		2.4%
Firm	0.0000	0.0722		0.0722	0.0%	47.3%		47.3%
Residual			######	0.0116			45.9%	45.9%
Total	0.0003	0.0135	######	0.0254	1.0%	53.1%	45.9%	100.0%

Standard errors appear beneath coefficient estimates.

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 7: Multi-country variance components previous research: Data, Methods and Results (results in % of variance)

	Makino, Isobe and Chan (2004)	Brito & Vasconcelos (2006)	McMahan and Victer (2010)	Our research
Source	METI	Compustat Global	Compustat Global	Compustat Global
Performance Definition	ROS	ROA	ROA	ROA
Industries	All	All	All	All
Firms' Origin	Japan	Global	Global	Global
Corporations	616	n/c	n/c	n/c
Industries	159	448	295	42
Countries	79	44	43	49
Firms / Business Units	5,183	12,592	4,551	20,447
Period	1996-2001	1997-2001	1993-2003	2000-2007
Observations	28,809	60,092	35,450	102,434
Method	Variance Components mixed effects	Minimum Norm Quadratic Estimation	Variance components ANOVA	Mixed effects hierarchical linear modeling

	Makino, Isobe and Chan (2004)			Brito & Vasconcelos (2006)			McGahan and Victer (2010)		
Variance Components	All countries	Developed countries	Newly Industrialized Economies	All Industries (avg.)	Range by Industry		All Countries	High-income countries	Midle-income countries
Country	4.3	3.6	4.4	2.8	0.0	17.7	1.1	1.7	1.5
Industry	5.0	5.5	6.7	2.6	0.0	8.6	4.5	7.4	14.4
Country-Industry	7.5			8.8	0.0	45.0	14.8	19.2	15.7
Firm/Business Unit	28.2	28.2	25.2	34.8	2.4	45.6	n.r.	n.r.	n.r.
Corporate	8.2	13.4	11.3						
Year	0.1	0.1	0.1	1.0	0.2	3.0	0.7	0.5	1.2
Year-Home Country							3.0	1.3	4.0
Year-Industry							7.3	7.2	20.2
Error	46.7	49.2	52.3	49.8	25.2	72.2	68.6	62.6	43.0