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The effects of cross-border and cross-industry M&As on home-region and global MNEs

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The paper examines the effects of international and product diversification through mergers and acquisitions (M&As) on the firm's risk–return profile. We identify the rewards from different types of M&As and investigate whether becoming a global firm is a value-enhancing strategy. Drawing on the theoretical work of Vachani (1991) and on Rugman and Verbeke's (2004) metrics, we classify firms according to their degree of international and product diversification. To account for the endogeneity of M&As, we develop a panel vector autoregression. We find that *global* and *host-region* multinational enterprises (MNEs) benefit from cross-border M&As that reinforce their geographic footprint. Cross-industry M&As enhance the risk–return profile of *home-region* firms. This effect depends on the degree of product diversification. Hence there is no value-enhancing M&A strategy for *home-region* and *bi-regional* firms to become 'truly global'.

1. Introduction

Cross-border mergers and acquisitions (M&As) are the dominant form of foreign direct investment (FDI) and among one of the most widely executed strategic decisions in pursuit of international diversification (Hitt, 2000; Shimizu, Hitt, Vaidyanathc and Pisanod, 2004; Stiebale and Reize, 2011; UNCTAD, 2007). In addition, M&As are frequently used to diversify across product markets motivated by a risk-reduction strategy (Amihud and Lev, 1981). A question rarely addressed is whether multinational enterprises (MNEs) with different international footprints and product variety exhibit similar benefits from added geographic and product diversification through M&As. Put differently, is becoming a global firm a value-enhancing strategy for all MNEs? This question is essential in understanding the process of regionalization identified by Rugman (2000), Rugman and Girod (2003) and Rugman and Li (2007).

Drawing on transaction cost economics (TCE), the resource-based view (RBV) and on organizational learning in the context of M&As (Hitt, Hoskisson and Ireland, 1994; Hitt, Hoskisson and Kim, 1997), the paper investigates the impact of M&As and divestitures on the firm's risk–return profile. We distinguish between four types of transactions: cross-border, domestic, cross-industry and related. Building on the work of Vachani (1991), firms can be classified with respect to product and geographic diversification to assess the impact of internationalization on risk and performance.¹ To account for regionalization, we follow Rugman and Verbeke's (2004) metrics and distinguish between *home-region*, *bi-regional*, *host-region* and *global* firms. To capture the degree of product diversification, we use a standard Herfindahl index based on product groups (Montgomery, 1982). We develop three hypotheses embedded in the theoretical debate about the role of product and geographic diversification as moderators for the performance–expansion relationship. We propose a panel vector autoregression (VAR) that accounts for the endogeneity of M&As as suggested

by the theoretical and empirical literature (Hitt, Hoskisson, Johnson and Moesel, 1996; Hitt, Tihanyi, Miller and Connelly, 2006; Kling and Weitzel, 2010; Lucas and McDonald, 1990; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf, Robinson and Viswanathan, 2005; Shleifer and Vishny, 2003).

This research makes theoretical, methodological, empirical and practitioner contributions. The theoretical contribution is to extend frameworks for analyzing the performance–internationalization relationship in the context of regionalization, building on the RBV, TCE and organizational learning (Hitt *et al.*, 1994, 1997). We argue, using Rugman and Verbeke’s (2004) typology, that the firm’s geographic footprint moderates the performance–internationalization relationship. Furthermore, we suggest that the extent of product diversification is another moderator of the performance–internationalization relationship. Product diversification also interacts with the firm’s geographic footprint. These arguments lead to three hypotheses exploring the link between geographic footprint, product scope and value-enhancing diversification through M&As. The methodological contribution is to develop a panel VAR framework, which overcomes the limitations of single-equation models by incorporating multidirectional causality. The empirical contribution stems from linking product diversification, geographic footprint and the type of transactions (M&As, divestitures) – a linkage missed by prior empirical studies. The findings of empirical studies examining the impact of cross-border M&As on performance are equivocal (Datta and Puia, 1995; Eun, Kolodny and Scheraga, 1996; Lee and Caves, 1998; Mørck and Yeung, 1991; Santos, Errunza and Miller, 2008; Seth, Song and Pettit, 2000, 2002). Contrarily, the outcome of research on repercussions of diversification across industries is consistent suggesting that the effect on shareholder value is negative, while risk reduction benefits bondholders (Amihud and Lev, 1981; Ansoff, 1957; Berger and Ofek, 1995; Boyd, Gove and Hitt, 2005; Chandler, 1962, 1990; Lane, Cannella and Lubatkin, 1998; Penrose, 1973; Santos, Errunza

and Miller, 2008). The practitioner contributions are threefold. The findings suggest that the success of different value-creating growth strategies depends on the types of firms, which offers an important lesson for strategic decision makers. The findings show that *global* and *host-region* firms benefit from cross-border M&As, whereas *home-region* firms gain value from product diversification but only up to an inflection point, where further product diversification becomes unmanageable. Finally, the findings illustrate that there is no value-enhancing M&A strategy for *home-region* and *bi-regional* firms to become a *global* firm; the phenomenon of regionalization is here to stay.

2. Research background and hypotheses

2.1 Conceptual framework

The ownership–location–internalization (OLI) framework has been the predominant theory for analyzing cross-border M&As (Dunning, 1993; Shimizu *et al.*, 2004; Williamson, 1975). Brouthers, Brouthers and Werner (1999) contend that prior research favors the OLI framework, because it combines several factors such as transaction costs, ownership and location-specific variables. It is a synthesis of the internalization theory (Buckley and Casson, 1976; Dunning, 1981; Rugman, 1981), which is mainly based on TCE, and other theories addressing market power and country-level effects (Cantwell and Narula, 2001). A limitation of the OLI framework is that it is only applicable in the context of outward FDI into host countries (Rugman, 2010). As such the OLI framework is not relevant for the analysis of domestic versus cross-border transactions. Internalization theory, however, is relevant and embedded in the conceptual framework, which refers to firm-specific assets (FSAs).²

As discussed in the following sections, we extend Hitt *et al.*'s (1994, 1997) theoretical work on the performance–internationalization relationship and the interaction between product and international diversification by considering different types of firms using

Rugman and Verbeke's (2004) metrics. By focusing on M&As, we also draw on the theoretical work on cross-border M&As discussed by Shimizu *et al.* (2004). In line with Hitt *et al.* (1994, 1997) and Shimizu *et al.* (2004), the conceptual framework integrates the RBV, TCE and organizational learning.

The RBV offers theoretical explanations for M&As, as 'mergers and acquisitions provide an opportunity to trade otherwise non-marketable resources and to buy or sell resources in bundles' (Wernerfelt, 1984: 175). Moreover, the suggested benefits of international diversification relate predominately to resources (Barney, 1991; Fladmoe-Lindquist and Tallman, 1994). Tallman and Li (1996) contend that firms differ in terms of their internal resources and capabilities, implying that the benefits of internationalization differ across firms. We draw on that notion and explore the differences between firms along two dimensions: the degree of product diversification and global reach (Rugman and Verbeke, 2004; Vachani, 1991).

The costs of international diversification are mainly due to transaction costs that increase with the enhanced coordination required and with a higher demand for managerial information processing (Hitt *et al.*, 1994; Jones and Hill, 1988; Roth, 1992; Roth, Schweiger and Morrison, 1991). Hence, the theory suggests a point of inflection at which transaction costs outweigh the benefits of further internationalization. Again, this turning point depends on firm-specific factors such as managerial skills (Hitt *et al.*, 1997) and the firm's current levels of product and international diversification (see section 2.2).

The interaction effects of product and international diversification are complex and can be better understood using an organizational learning perspective, which focuses on experience and organizational structure (Barkema and Vermeulen, 1998; Chandler, 1962; Hoskisson, 1987; Hoskisson and Hitt, 1988; Kogut and Zander, 2003; Madhok, 1997; Vermeulen and Barkema, 2001). Moreover, this perspective suggests that product

diversification is a moderator with positive effects on the performance–internationalization relationship (Hitt *et al.*, 1997). We suggest in section 2.3 that international diversification elevates the benefits of product diversification mainly due to organizational learning. Building on this conceptual framework, the following subsections develop the three testable hypotheses.

2.2 Cross-border M&As and different types of acquirers

The theoretical discussion of the benefits of international diversification has been primarily based on the RBV (Barney, 1991; Fladmoe-Lindquist and Tallman, 1994). In this context, it is important to stress the predominant role of the internalization theory and the benefits of internalization (Rugman, 1981). The most notable benefits include: (1) optimal economic scale (economies of scale and scope); (2) standardization of products across countries, which facilitates rationalizing production and coordinating critical resource functions (Kobrin, 1991); (3) amortization of investment like brand image or other intangible assets (Hitt *et al.*, 1997); and (4) resource sharing and synergies (Grant, Jammine and Thomas, 1988). In addition, as firms internationalize, they learn more about the management of such diversification, which enhances performance (Kochhar and Hitt, 1995; Kogut, 1985). As they gain more experience with internationalization they are able to create higher returns from it.

As noted earlier, the costs of international diversification are mainly due to increased transaction costs; but organizational learning produces some costs, too. International diversification increases the coordination, distribution and managerial information-processing demands (Hitt *et al.*, 1994; Jones and Hill, 1988). Moreover, trade barriers (e.g. laws, regulations and cultural differences) increase tangible and intangible costs (Kogut, 1985; Sundaram and Black, 1992). Closely related to trade barriers is the notion of the ‘liability of foreignness’ that consists of three components: exchange risk, unequal market access due to

discrimination by host countries' institutions and lack of knowledge of foreign market (Hymer, 1960). Roth (1992) and Roth *et al.* (1991) stress the complexity of managing an internationally diversified firm, which suggests that there is a point of inflection where costs outweigh benefits. Accordingly, firms with a high level of international diversification are likely to benefit less from further internationalization. The point at which costs begin to outweigh benefits depends on firm-specific attributes such as managerial skills (Hitt *et al.*, 1997).

The question then arises how firm-specific differences affect the benefits and costs of international diversification. Following Vachani (1991), we focus on firm-specific differences regarding global reach and product diversification and apply Rugman and Verbeke's (2004) metrics. Rugman and Verbeke (2004) build on the notions of triad regions and triad power (Ohmae, 1985). Extending the core triad to the broad triad (NAFTA, the expanded EU and Asia), Rugman and Verbeke (2004) propose four major groups of firms to include *home-region*, *bi-regional*, *host-region* and *global*. This approach suggests similarities within each triad region in terms of institutions, economic development and culture, which facilitate international business. Rugman and Verbeke (2004) highlight the importance of FSAs for multinational expansion and, in particular, the extent to which FSAs are transferable. They argue that the main obstacle to becoming a global firm lies in customers in the home region valuing the firm's FSAs more than in other regions. Hence there is a 'liability of interregional foreignness'; a concept developed by Rugman and Verbeke (2004, 2007), which focuses on FSAs used in the home region compared to FSAs employed in a foreign region. Rugman and Verbeke (2007) argue that FSAs need to be modified or developed to reduce transaction costs, which increase due to the distance (i.e. cultural, institutional, economic and geographic) between home and host region. This liability

can be overcome through a learning process, thereby stressing the importance of experiential learning (e.g. Barkema, Bell and Pennings, 1996; Johansson and Vahlne, 1977, 1990).

Another key factor for creating value from cross-border M&As is the effectiveness of post-merger integration (Child, Falkner and Pitkethly, 2001; Inkpen, Sundaram and Rockwood, 2000; Lubatkin, Calori, Very and Veiga, 1998; Olie, 1994; Weber, Shenkar and Raveh, 1996). Research on post-merger integration also calls on the notion of experiential learning (Barkema *et al.*, 1996; Johansson and Vahlne, 1977, 1990). Shimizu *et al.* (2004) contend that the ‘liability of foreignness’ is also relevant in the context of cross-border M&As and a main barrier to creating shareholder value (Zaheer, 1995). A firm has to overcome the ‘liability of foreignness’ during its expansion phase. Organizational learning, accumulated while building an international presence, reduces the ‘liability of foreignness’. The literature on cross-border M&As still uses the ‘liability of foreignness’ based on Hymer’s (1960) concept, which differs from the concept of the ‘liability of interregional foreignness’ (Rugman and Verbeke, 2004, 2007) in that Rugman and Verbeke stress that FSA bundles differ between the home and host region. Hence, compared to a *home-region* oriented firm, a *global* firm is more likely to possess the experience and managerial skills required to effectively integrate acquired foreign businesses. However, there is an upper limit on the absorptive capacity of MNEs (Cohen and Levinthal, 1990). Hence, we formulate the first hypothesis.

Hypothesis 1: Firms with a global footprint create more value through cross-border M&As than home-region MNEs.

If Hypothesis 1 were confirmed, it would suggest that *global* firms possess an advantage when it comes to conducting cross-border M&As. In other words, for a *global* firm

cross-border M&A is likely to represent a value-enhancing strategy. On the other hand, a *home-region* firm is likely to create less value from cross-border M&A, which in turn might deter it from becoming internationally diversified.

The second hypothesis extends the analysis by adding the dimension of product diversification. As the paper deals with a dynamic perspective of becoming a global firm, understanding the interplay between international diversification and product diversification is crucial. Based on the extant literature, we argue that both forms of diversification affect organizational learning; hence it matters whether a focused firm (with narrow product range) or a diversified firm (with a broad product range) intends to expand globally.

Interestingly, product diversification is often considered a control variable in studies examining the performance–geographic scope relationship but has received less theoretical attention (e.g. Goerzen and Beamish, 2003; Shimizu *et al.*, 2004). Drawing on learning theory, Hitt *et al.* (1997) argue that firms with a higher degree of product diversification gain more from international diversification. From an organizational learning perspective, executives of a focused firm have little opportunity to develop skills and experience of managing the internal diversity or complexities inherent in diversified firms (Hitt *et al.*, 1997). Consequently, focused firms lack the managerial experience to manage an internationally diversified business. Apart from managerial experience, Hitt *et al.* (1997) stress the importance of organizational structure, as firms that diversify their product line commonly establish a multidivisional structure (Chandler, 1962; Hoskisson, 1987; Hoskisson and Hitt, 1988). Firms with a multidivisional structure have to establish processes to manage conflicts between business segments (e.g. transfer pricing, cooperation, internal capital markets and allocation of resources). In conclusion, Hitt *et al.* (1997) contend that, compared to focused firms, diversified firms are likely to gain greater advantage from internationalization because they possess better and more relevant management capabilities, more efficient structures and

better governance. From a dynamic perspective, firms might engage in product diversification to enhance organizational learning and build a multidivisional structure, which facilitates becoming a truly *global* firm. Accordingly, we derive the second hypothesis.

Hypothesis 2: Firms with greater product diversification create more value through cross-border M&As than focused firms.

If Hypothesis 2 were true, it would suggest that *home-region*, *bi-regional* and *host-region* firms could become global by first expanding their product range.

2.3 Cross-industry M&As and different types of acquirers

To complete the dynamic perspective, we need to consider the potential impact of international diversification on product diversification. If we confirmed Hypothesis 2, we would expect that firms increase their product range as a first step to grow their business, build organizational structures and gain experience before becoming a global firm. In a third hypothesis an alternative route, where firms first expand internationally before diversifying their product range, is also conceivable.

Pertinent research largely supports the notion that diversification across industries leads to a conglomerate discount (Berger and Ofek, 1995; Boyd, Gove and Hitt, 2005; Graham, Lemmon and Wolf, 2002; Santos *et al.*, 2008). In spite of disputes about measurement problems (e.g. acquisitions of heavily discounted targets in unrelated industries), there is little evidence that diversification across industries increases firm value; instead the extant literature points to a trade-off between returns and risk. Specifically, there seems to be a transfer of value from shareholders to bondholders due to the risk-reducing effect of

product diversification (Ansoff, 1957; Chandler, 1962, 1990; Mansi and Reeb, 2002; Penrose, 1973).

Although research suggests that unrelated diversification reduces shareholder value and increases bondholder value (by reducing risk), its integration with the geographic scope of MNEs reveals an even more complex interrelationship. Hitt *et al.* (1994) develop theoretical arguments suggesting that international diversification is a moderator of the product diversification–performance relationship. Hitt *et al.* (2006) argue that related diversified firms can better exploit business-unit interdependencies on a global scale, whereas unrelated diversified firms benefit from economies of scale and scope. Therefore being global seems to be good for focused and diversified firms alike. Firms with a substantial international footprint require structures and processes suited to managing conflicts between business units and the inherent complexities of operating under different institutional and regulatory frameworks (Chandler, 1962; Hoskisson, 1987; Hoskisson and Hitt, 1988). International diversification necessitates organizational structures and processes capable of handling complexity. Learning theory contends that the knowledge and experience gained from managing an internationally diversified firm can be used to manage product diversification more effectively. In the context of organizational learning, research suggests that there could be an upper limit to the ability to manage complexity (due to product or international diversification), above which absorbing the knowledge needed to integrate newly acquired businesses or products becomes a challenge (Cohen and Levinthal, 1990).

Research on product diversification stresses the importance of synergies (Geringer, Beamish and daCosta, 1989; Rumelt, 1974; Tallman and Li, 1996). In particular, economies of scale and scope arise from sharing and leveraging current resources such as intangible assets, production facilities and distribution channels across business units (Chang and Wang, 2007; Pennings, Barkema and Douma, 1994). From the RBV perspective, structures and

capabilities required for the successful execution of product diversification strategies are equally useful in the execution of international diversification strategies – and vice versa (Hitt *et al.*, 1997). Accordingly, Hitt *et al.* (1997) argue that the synergy potential from product diversification increases with international diversification, as firms can share and leverage their current resources and capabilities across business units in different product and country markets. Achieving synergies (e.g. resource sharing) across products and geographic units leads to a competitive advantage for firms (Hitt *et al.*, 1994; Lei, Hitt and Goldhar, 1996). This competitive advantage is long-lasting, as unrelated products offer unique and inimitable synergies due to differences between business units (Hitt *et al.*, 1997). Moreover, Harrison, Hitt, Hoskisson and Ireland (1991) emphasize that complementarities between different resources in separate business units are difficult to imitate. The inimitability of synergies is essential for a long-lasting competitive advantage, which in turn results in superior performance.

In summary, Hitt *et al.* (1997) contend that certain economies of scale and scope are unavailable to firms that focus either on product or on international diversification. The theoretical arguments discussed above suggest that international diversification has a positive effect on the performance–product diversification relationship. Apart from the focus on performance, Kim, Hwang and Burgers (1989) suggest that an integrated product and international diversification strategy influences profit stability and, hence, risk. They argue that the benefits of diversification across industries and countries are due to differences in factor markets and demand/supply for different products. Consequently, we formulate the third hypothesis.

Hypothesis 3: Internationally diversified firms are better placed to extract value from cross-industry M&As.

If Hypothesis 3 were true, firms with a global reach would benefit more from product diversification. Thus by considering the impact of international diversification on product diversification, Hypothesis 3 suggests a different route to becoming a *global* firm than Hypothesis 2.

3. Methods, data and construction of variables

3.1 Composition of sample and data sources

We selected listed US and European companies with a market capitalization in excess of ten billion USD in at least one year between 2002 and 2007. The time period captures the sixth merger wave. The sample excludes financial institutions and utilities due to differences in reporting and regulation. This resulted in a sample of 478 companies – 272 US and 206 European companies. As we collected quarterly data on transactions, financials and control variables, the panel dataset contains 17,208 observations. The Thompson Mergers and Acquisitions database provides data on M&As and divestitures announced between 1 January 2002 and 31 December 2007. Identifying the ultimate acquirer and target is important; otherwise misclassification can occur when subsidiaries initiate transactions. For instance, Uni2 Telecomunicaciones SA (the Spanish subsidiary of France Télécom) acquired Centre de Telecomunicaciones (a Spanish telecom company), which should be classified as a cross-border transaction. We deleted duplicated deals and consider the following types of transactions: disclosed value M&As, minority stake purchases, acquisitions of the remaining interest, privatizations, leveraged buyouts and tender offers.

3.2 Measuring and classifying M&As and divestitures

The study excludes other forms of FDI (i.e. Greenfield), which might understate the extent of internationalization. Yet, Stiebale and Reize (2011: 155) contend that ‘cross-border mergers

and acquisitions (M&As) constitute a large share of global FDI flows reaching 80% in the years of merger waves'. Moreover, M&A data is superior, for it provides reliable industry coding so that we can analyze geographic and product diversification simultaneously. Data on Greenfield FDI are not available on this fine-grained level (Shimizu *et al.*, 2004). Greenfield FDI takes much longer to materialize in firm performance than M&As. Finally, there is an issue concerning consistency when using Greenfield measures. Using M&A data we can also compare cross-border and domestic transactions in related or unrelated industries. In particular, in domestic cross-industry investment, it would be difficult to include a Greenfield measure due to lack of data. We classify M&As and divestitures into four categories: (1) cross-border, (2) domestic, (3) related and (4) unrelated transactions. We categorize transactions as related or unrelated comparing the two-digit SIC codes of acquirers and targets (Sambharya, 2000; Vachani, 1991). To assess the importance of transactions, we use reported deal values. All M&A studies face the problem that deal values are not always disclosed. The literature suggests that undisclosed deals tend to be significantly smaller and account for about 1/6th of total deal value (Pryor, 2001). Deal values are net of liabilities; hence to obtain a relative measure of the importance of M&As and divestitures we use the acquirer's net assets before the transaction occurs (*net assets*). We derive a long-term measure of acquisition strategy by cumulating cross-border M&A measured relative to the acquirer's net assets over time (*buy_cross*). We follow the same procedure for cross-border divestitures (*sell_cross*), acquisition of unrelated businesses (*buy_div*) and sale of unrelated businesses (*sell_div*). For instance, if the measure *buy_cross* is 0.8 in the year 2000, it means that the MNE has acquired businesses abroad in the period until 2000 that account for 80% of the acquirer's net assets. Equation 1 illustrates the construction of the measures, where index *i* refers to a firm and *t* to a point in time. A similar definition applies to *sell_cross*, *buy_div* and *sell_div*.

$$buy_cross_{it} = \sum_{j=0}^t \frac{deal\ value_{it}}{net\ assets_{it}} \quad (1)$$

3.3 Additional dependent variables: firm valuation and risk

To assess firm value, we use market-to-book ratios (*MTB*) defined as the market value of equity divided by the book value of equity. To quantify the firm's exposure to risk, we use operational risk. Operational risk refers to cash flow uncertainty, which we evaluate based on variation coefficients of cash flows (*risk*).³ Datastream provides data on both measures. We considered alternative measures of firm valuation and risk. Previous studies on internationalization have criticized Tobin's Q because it also reflects changes in total assets and debt. Internationalization increases total assets and debt, which can reduce Tobin's Q (Gozzi, Levine and Schmukler, 2008). To quantify risk, one could also estimate beta coefficients; yet beta is a measure of systematic risk (market risk) and not firm-specific risk (idiosyncratic risk). Changing the business by expanding into different markets (e.g. geography) should affect first and foremost firm-specific risk. For instance, diversification affects the mix of revenue streams, which translates into cash flows (cash flow risk), which in turn affects stock market volatility. How these firm-specific changes affect systematic risk is difficult to establish.

3.4 Control variables

We included the following firm-specific control variables collected from Datastream: (1) firm size defined as the natural logarithm of total assets (*size*), (2) accounting performance measured by return on assets (*ROA*), (3) growth of assets and earnings (*growth* and *eps_growth*) and (4) financial leverage (*leverage*). Firm size is a widely used control variable to account for economies of scale, access to resources and maturity of the business, among

other factors (Qian, 2002; Qian, Yang and Wang, 2003; Wolff and Pett, 2000). Prior studies have used profitability measures such as ROA to assess the long-term impact of M&As on performance (Cartwright and Schoenberg, 2006; Tuch and O'Sullivan, 2007). Firm valuation captured by market-to-book ratios usually depends on a firm's growth opportunities and probability. Hence we account for growth in assets and earnings, which follows the research on glamour versus value stocks (e.g. Lakonishok, Shleifer and Vishny, 1994). The literature also stresses the need to control for the financial stability of firms (e.g. Piotroski, 2000); thus we consider financial leverage.

3.5 Rugman and Verbeke's (2004) classification of firms

Rugman and Verbeke (2004) define three 'triad' regions: NAFTA, the extended EU and Asia. We determine regional sales as domestic sales plus sales in the region, which follows Rugman and Verbeke's (2004) approach. For instance, to determine regional sales of a US-based MNE with operations in Canada and Mexico, we need to combine sales in the three markets, as they belong to the same region. Bloomberg provides data on the geographic split of sales; however, segment reporting is not consistent across firms, hence it requires manual adjustments. For instance, some MNEs use unusual geographic segments such as 'Europe/South Pacific'. Rugman and Verbeke (2004) distinguish four types: (1) *home-region* firms have at least 50% of their total sales in their home region, (2) *bi-regional* firms exhibit between 20 and 50% of their sales in their home region and 20 to 50% of their sales in one of the other two triad regions, (3) *host-region* oriented firms exceed 50% of sales in a triad region outside their home region and (4) *global* firms have at least 20% of sales in each of the three triad regions.

3.6 Measuring the degree of product diversification

To quantify the current degree of product diversification at the firm level, we collected sales data for the ten leading product groups. This information is found in the annual reports and is partly available in Bloomberg. Following Montgomery (1982), we determined a Herfindahl index of sales across the ten product classes. The measure is standardized with limits of 0 (focused firm) and 1 (diversified firm). Equation 2 shows the measure (*product_div*), where sales refer to firm *i* in period *t* and product class *j*.

$$product_div_{it} = 1 - \frac{\sum_{j=1}^{10} sales_{jit}^2}{\left(\sum_{j=1}^{10} sales_{jit}\right)^2} \quad (2)$$

3.7 Dynamic models: accounting for the endogeneity of M&As

If firm-specific factors such as valuation levels influence M&A decisions, an endogeneity bias occurs, which distorts the findings of empirical studies that rely on single-equation regressions. There is theoretical and empirical support for the endogeneity of M&As (Hitt *et al.*, 1996, 2006; Kling and Weitzel, 2010; Lucas and McDonald, 1990; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf *et al.*, 2005; Shleifer and Vishny, 2003). To account for the alleged endogeneity bias, the econometric model needs to allow multidirectional causality. We apply a panel VAR that captures the dynamics between firm value, risk and diversification strategies. The VAR uses market-to-book ratios (*MTB*), operational risk (*risk*), internationalization (*buy_cross*, *sell_cross*) and diversification across industries (*buy_div*, *sell_div*) as dependent variables. Lagged values of each dependent variable can affect current values of other dependent variables. Hence past valuation levels can affect current diversification strategies, and prior acquisitions can determine the current risk–return profile. Before using the VAR framework, we must confirm that the six variables are stationary. We conduct panel unit-root tests (i.e. panel Dickey–Fuller tests), which reject the null hypotheses

that the six variables exhibit a unit-root (are non-stationary) with p-values of 0.001. Next we determine the lag length of the VAR model using the Bayesian Schwarz information criterion, which suggests one lag. Accordingly, the model includes the observations of the previous year as explanatory (predetermined) variables. Equation 3 describes the VAR in reduced form, which also includes lagged control variables.

$$\mathbf{y}_{it} = \mathbf{\Gamma}\mathbf{y}_{it-1} + \boldsymbol{\theta}_1\text{size}_{it-1} + \boldsymbol{\theta}_2\text{leverage}_{it-1} + \boldsymbol{\theta}_3\text{growth}_{it-1} + \boldsymbol{\theta}_4\text{eps_growth}_{it-1} \quad (3) \\ + \boldsymbol{\theta}_5\text{ROA}_{it-1} + \mathbf{u}_i + \boldsymbol{\varepsilon}_{it}$$

Equation 3 shows a system of four equations, one for each dependent variable. The dependent variables are captured in the column vector \mathbf{y}_{it} , and the 4×4 dimensional matrix $\mathbf{\Gamma}$ contains the coefficients of the lagged dependent variables \mathbf{y}_{it-1} . As cross-border and cross-industry transactions are interrelated (e.g. a transaction can be both cross-border and cross-industry), we run separate models for cross-border transactions and diversification across industries in line with the three hypotheses. Hence, the model has four dependent variables: market-to-book ratios, cash flow risk, M&As and divestitures (either cross-border or across industries).⁴

4. Empirical findings

Table 1 provides the sample composition. In contrast to common belief that the Anglo-Saxon market-based system stimulates a market for corporate control, we observe that merger activity relative to the number of firms is the highest in Norway (16.4 M&As per firm) followed by Belgium (14.0) and Spain (13.0). The share of cross-border transactions seems to be also driven by geography; for example, not unexpectedly, smaller countries such as Ireland, Belgium and Luxembourg exhibit almost exclusively cross-border transactions. Table 1 shows that the majority of transactions involve related industries (on average 59.1%); however, a few countries exhibit exceptionally high levels of diversification across industries

(e.g. Finland and Ireland). Using Rugman and Verbeke's (2004) classification, the sample contains 363 (76%) *home-region* firms, 16 (3%) *bi-regional* firms, 63 (13%) *host-region* firms and 36 (8%) *global* MNEs. On average, MNEs based in the USA have a higher proportion of regional sales than their European counterparts. Thus European MNEs are less *home-region* oriented (64%) than their US counterparts (85%).

(Insert Table 1)

Descriptive statistics show that *global* firms exhibit the highest level of product diversification (*product_div*) based on mean and median.⁵ The lowest 25% of *global* firms have a measure of 0.48, which exceeds the median of *home-region* and *host-region* firms. Product diversification is low in the case of *home-region* firms; however, the lowest level of product diversification can be observed among *host-region* firms. This finding reflects the fact that *host-region* firms largely operate in industries that rely on natural resources (e.g. mining) or benefit from outsourcing of manufacturing (e.g. semiconductors, where rare earth elements are critical to production). For instance, five firms classified as *host-regional* belong to the mining sector (three copper ores, one iron ores and one ferroalloy ores); five firms are in the semiconductor industry, with products made mainly in China. Many mining companies listed at the London Stock Exchange (e.g. Antofagasta PLC) have operations outside Europe.

To illustrate the difference in terms of net growth from cross-border transactions between the four types of firms, we analyzed the net cumulated growth from cross-border M&As for an average firm in the respective category.⁶ *Home-region* firms have remained roughly at the same level since 2003 of about 10% of net assets; hence, the net effect of cross-border M&As and divestitures accounts for only 10% of net assets. *Bi-regional* firms increased their share of growth from cross-border transactions recently – but are still below other types. *Host-region* and *global* firms achieve on average 25% of their net assets from cross-border transactions.

Table 2 reports the correlation matrix. Correlation coefficients are very low for most variables – except in the case of *buy_cross* and *sell_div* (0.54). This linear relationship arises if a firm acquires a business abroad and sells unrelated business units of the target firm. Selling business units might also be a regulatory requirement to avoid gaining market power. Due to the high correlation, the empirical models analyze the two types of transactions (geography and industry) separately. Variance inflation indicators (VIFs) show that *buy_cross* has the highest VIF of 1.54, which is still below the critical value of 5 commonly applied in the literature (Greene, 2000). Hence there is no evidence of multicollinearity.

(Insert Table 2)

After estimating the VAR model in Equation 3, we conduct Granger causality tests to uncover the causal relationships between the dependent variables. Market-to-book ratios affect cross-border M&As (*MTB* causes *buy_cross*) and M&As across industries (*MTB* causes *buy_div*). Therefore firm valuation affects the likelihood of M&As, which underlines the point that M&As are endogenous.

To test Hypothesis 1, we ran the panel VAR described in Equation 3 using a fixed and random-effects specification for the firm-specific error term \mathbf{u}_i . To decide whether to use a fixed or random-effects model, we ran Hausman tests on all models. For instance, the Hausman test based on the first equation of the VAR shows a chi-square test statistic of 2012 with a p-value of 0.000. Hence we can reject the null hypothesis that the difference in the coefficients obtained from a fixed and random effects model are not systematic, which suggests a random-effects model (Greene, 2000). Table 3 reports equation-by-equation random effects models and shows the first two equations with market-to-book ratios (*MTB*) and cash flow risk (*risk*) as dependent variables. *Global* and *host-region* firms benefit from cross-border M&As indicated by positive and statistically significant coefficients of *buy_cross*. The negative and statistically significant coefficient of *sell_cross* in column five

(-2.775) suggests that *global* firms destroy value if they exit foreign markets; thus there is a benefit in remaining global. Moreover, *host-region* firms can reduce cash flow risk through cross-border M&As. So it seems to be challenging for *home-region* and *bi-regional* firms to create value through cross-border transactions. These results support Hypothesis 1.

(Insert Table 3)

To account for the degree of product diversification, we modify the panel VAR in Equation 3 and include *product_div* as an additional variable. We also consider the interaction terms between buying or selling across industries and the degree of product diversification. The hypotheses tests indicate that *product_div* and the two interaction terms do not provide a statistically significant effect on the performance–expansion relationship. The joint hypothesis that all variables related to product diversification do not affect the dependent variables cannot be rejected, as the chi-square test statistic reaches 2.17 (*p*-value 0.538). Accordingly, these results do not provide support for Hypothesis 2.⁷

Considering the impact of control variables in both models shows an inconsistent impact of leverage. Leverage has a positive effect for *home-region* firms but a negative effect for *bi-regional* and *global* firms. *Home-region* firms have the lowest leverage, on average; hence for this group increasing debt enhances shareholder value. These firms are below the optimal level of leverage; whereas global firms tend to have too much debt, which increases financial risk and limits their capacity to obtain and carry additional debt. As expected, profitability (*ROA*) has a positive impact on firm valuation.

To test Hypothesis 3, we change the independent variables and now consider cross-industry acquisitions and divestitures (*buy_div* and *sell_div*). We add *product_div* and interaction terms (*inter_buy* and *inter_sell*) to the panel VAR in Equation 3. Accordingly, the model can determine whether acquiring or selling unrelated businesses changes firm value and risk depending on the current degree of the firm’s product diversification. Table 4 shows

the impact of diversification across industries on valuation levels and risk. In general, *home-region* firms benefit from buying unrelated business, for *buy_div* has a positive and statistically significant coefficient. However, the impact depends on the degree of product diversification; if *product_div* is close to 1 (highly diversified business) the effect can become negative. Firms benefit from diversification across industries, as long as they are below a certain threshold of diversification. The threshold in the sample is 0.62, which is close to the 75-percentile of *home-region* firms in terms of product diversification. Consequently, the majority of *home-region* firms benefit from diversification across industries. Therefore these results do not provide evidence of a conglomerate discount as suggested by the literature. As only *home-region* firms benefit from cross-industry M&As, Hypothesis 3 needs to be rejected.

(Insert Table 4)

5. Discussion and conclusions

The paper uncovers the impact of international and product diversification through M&As and divestitures on risk–return profiles of *home-region*, *bi-regional*, *host-region* and *global* MNEs. Consequently the paper contributes to research on regionalization by analyzing value-creating M&A activities conducted by different types of firms (Rugman, 2000; Rugman and Girod, 2003; Rugman and Li, 2007). Theoretically, we argue that product and geographic diversification are moderators of the performance–expansion relationship. Drawing on the RBV, TCE and organizational learning theories, we develop three hypotheses that explore the interrelationship between internationalization, product diversification and the success of cross-border and cross-industry transactions. The hypotheses suggest different pathways to becoming a *global* firm.

In contrast to prior empirical research, we develop a panel VAR to account for the endogeneity of M&As and divestitures suggested by the literature (Hitt *et al.*, 1996, 2006). Granger causality tests confirm that M&As and divestitures are endogenous; hence single-equation models used in prior research are likely to yield biased results. The empirical results provide strong evidence in support of Hypothesis 1. *Global* and *host-region* firms enhance their valuation level with cross-border M&As and reduce their valuation level (in the case of *global* firms) when they leave foreign markets. The latter observation is interesting as it points to the importance of maintaining a global presence, which supports the arguments related to FSAs and distribution channels (Ohmae, 1985; Rugman and Verbeke, 2004). Leaving a foreign market can affect the performance of operations elsewhere. This observation cannot be explained using an organizational learning perspective (Barkema and Vermeulen, 1998; Madhok, 1997; Vermeulen and Barkema, 2001). Rather, it underlines the importance of interdependencies, which need to be exploited through building and maintaining synergies across markets. Furthermore, risk reduction occurs in the case of *host-region* firms. In contrast, Hypothesis 2 did not receive support as product diversification does not affect the impact of cross-border transactions on the firm's risk–return profile. However, descriptive findings suggest a possible link between product and international diversification in that *home-region* firms are more focused than *bi-regional* and *global* firms. Empirically, Rugman and Verbeke's (2004) classification seems to capture the effect so that product diversification as a moderator does not exhibit an additional influence. Testing Hypothesis 3 reveals that cross-industry M&As are a value-creating strategy only for *home-region* firms. This finding seems to be surprising, as theoretical arguments suggest that internationally diversified firms are better placed to benefit from product diversification due to organizational learning. Accordingly, the three hypotheses tests underline that there is no value-enhancing M&A strategy for *home-region* and *bi-regional* firms to become *global*

firms. The ‘liability of interregional foreignness’ seems to be a strong force preventing firms from becoming ‘truly global’ (Rugman and Verbeke, 2004, 2007).

What are the strategic implications? *Home-region* firms should focus on opportunities within their home regions; they should consider diversifying their product portfolio. *Bi-regional* firms do not enhance firm value through diversification across industries. There is a risk implication; selling unrelated businesses reduces risk, but this effect depends on the current degree of product diversification. There are two different strategies: focused *bi-regional* firms benefit from selling unrelated businesses, but highly diversified *bi-regional* firms increase their risk if they sell unrelated businesses. So it depends on the firm’s current level of product diversification. *Host-region* firms benefit from selling unrelated business, although this effect declines with greater focus. Strategically, *host-region* firms tend to be focused (e.g. mining companies), and the results suggest that they should remain focused. *Host-region* firms can reduce risk by selling unrelated businesses, whereas *global* firms should not sell unrelated businesses. Hence *global* firms should stay where they are in terms of their product markets.

This research makes a value-added contribution to the understanding of the outcomes of international and product diversification strategies implemented through M&As and divestitures. The research calls into question much of the prior empirical research that does not account for the endogeneity of entry and exit decisions. Based on the findings, it is not surprising that a home-region focus exists as value-enhancing growth can be achieved through product diversification but not through cross-border expansion in the case of *home-region* firms (Rugman and Verbeke, 2004). As such, these results may explain at least part of the motivation for MNEs to remain in their home region.

Apart from the theoretical and empirical contributions discussed above, the study offers practicing managers a better insight into the effects of international and product

diversification on the risk–return profile. It cautions managers of *home-region* MNEs of the consequences of selecting an M&A target outside their region. On the other hand, it suggests that managers of *global* MNEs enjoy greater freedom in their search for M&A targets that will create value for them. The study also suggests that success or failure of cross-border M&As is largely a product of internal factors, rather than the diversification or refocusing action itself. It is important to understand these factors prior to M&As.

The main limitation of the study is that we use secondary data, because of the large sample of 478 MNEs, 4,536 M&As and 3,277 divestitures. Relying on secondary data can potentially limit the accuracy of measures. In particular, we stress the limitations in measuring regional or global focus. Yet the large sample afforded by the secondary data, at least partly compensates for these limitations. The results suggest that considering the regional influence on MNEs is important for research on the performance effects of internationalization and product diversification. As such this research provides a base for future qualitative and quantitative research on the effects of internationalization and product diversification on *home-region* and *global* MNEs.

¹ Vachani (1991) uses the term ‘profit stability’ instead of risk.

² The eclectic theory (Dunning, 1988) has been criticized as it does not develop the ownership construct beyond internalization and market imperfections theory, which the RBV accomplishes (Itaki, 1991).

³ The standard deviation of cash flows depends on the mean of cash flows; thus we prefer using the variation coefficient to ensure comparability across firms and over time.

⁴ Using the multi-equation vector autoregression that accounts for endogeneity, we find no linear, quadratic or cubic relationship between performance and internationalization.

⁵ A detailed table with descriptive statistics is available from the authors on request.

⁶ A figure is available from the authors on request.

⁷ These additional findings related to Hypothesis 2 are not reported in Table 3 due to the lack of significant findings.

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Table 1. Composition of sample

Table 1 reports the composition of the sample including the number of firms in each country and the number of observations (Obs.). Observations refer to quarter-firm panel data. As firms do not conduct M&A in every quarter, the number of observations differs from the total number of M&A and divestitures (total). The table also reports the proportion of cross-border and horizontal transactions and the number of transactions per firm (frequency) in each country. The last column shows the proportion of regional sales based on segment reporting.

Country	Firms	Obs.	<u>Mergers & acquisitions</u>				<u>Divestitures</u>				<u>Regional</u>
			Total number	Cross-border	Related industries	Frequency	Total number	Cross-border	Related industries	Frequency	Sales in home region
AUT	3	108	24	87.5%	66.7%	8.0	19	89.5%	73.7%	6.3	100%
BEL	4	144	56	96.4%	75.0%	14.0	39	92.3%	76.9%	9.8	60.2%
CHE	14	504	124	91.9%	55.6%	8.9	85	77.6%	57.6%	6.1	46.9%
DEU	30	1,080	267	92.5%	56.2%	8.9	188	79.8%	61.7%	6.3	63.1%
DNK	4	144	30	80.0%	60.0%	7.5	15	86.7%	60.0%	3.8	47.1%
ESP	12	432	156	74.4%	53.2%	13.0	119	67.2%	63.9%	9.9	87.5%
FIN	3	108	26	96.2%	3.8%	8.7	14	57.1%	50.0%	4.7	59.8%
FRA	40	1,440	442	92.1%	61.8%	11.1	380	75.0%	62.9%	9.5	70.2%
GBR	49	1,764	568	88.2%	72.2%	11.6	522	77.0%	70.9%	10.7	62.9%
IRL	3	108	31	100.0%	38.7%	10.3	12	66.7%	66.7%	4.0	66.7%
ITA	11	396	118	76.3%	55.1%	10.7	110	70.9%	52.7%	10.0	80.3%
LUX	5	180	43	95.3%	67.4%	8.6	31	96.8%	87.1%	6.2	42.7%
NLD	15	540	102	93.1%	42.2%	6.8	89	62.9%	34.8%	5.9	51.3%
NOR	5	180	82	97.6%	75.6%	16.4	60	95.0%	93.3%	12.0	68.4%
SWE	8	288	30	93.3%	43.3%	3.8	21	66.7%	57.1%	2.6	67.7%
US	272	9,792	2,437	60.2%	57.2%	9.0	1,573	66.4%	66.0%	5.8	78.1%
Total	478	17,208	4,536	73.7%	59.1%	9.5	3,277	71.6%	65.3%	6.9	72.4%

Table 2. Correlation matrix

The table shows the pairwise correlation coefficients of all dependent and independent variables. The table refers to the market-to-book multiple (*MTB*), cash flow risk (*risk*), regional sales (*regional*), cross-border acquisitions (*buy_cross*), cross-border divestitures (*cross_sell*), unrelated acquisitions (*buy_div*), unrelated divestitures (*sell_div*), firm size (*size*), return on assets (*ROA*), financial leverage (*leverage*), revenue growth (*growth*) and growth in earnings per share (*eps_growth*).

	MTB	risk	regional	buy_ cross	sell_ cross	buy_div	sell_div	size	ROA	leverage	growth	eps_ growth
MTB	1											
risk	-0.01	1										
regional	-0.01	0.05	1									
buy_cross	0.04	-0.08	-0.03	1								
sell_cross	0.00	0.00	0.00	0.30	1							
buy_div	0.01	0.00	0.02	0.10	0.01	1						
sell_div	0.01	-0.01	0.03	0.54	0.19	0.04	1					
size	-0.03	0.03	0.05	0.06	0.00	0.09	0.06	1				
ROA	0.07	0.09	-0.01	-0.01	0.02	-0.05	0.01	-0.11	1			
leverage	0.54	0.00	-0.01	0.01	0.00	0.00	0.00	0.01	0.00	1		
growth	0.00	0.01	0.01	0.00	0.00	-0.01	0.00	-0.01	-0.03	0.00	1	
eps_growth	0.00	0.00	-0.01	0.00	0.00	-0.02	0.00	0.00	0.03	0.00	0.01	1

Table 3. The impact of cross-border M&As on valuation levels and risk

The table reports two equations of the panel VAR. Panel A shows the impact on market-to-book, whereas Panel B focuses on cash flow risk. All variables used in the models are lagged by one period to ensure weak exogeneity. The estimation refers to an equation-by-equation random effects model. The R-squared refers to the overall R-squared. The table refers to the market-to-book multiple (*MTB*), cash flow risk (*risk*), regional sales (*regional*), cross-border acquisitions (*buy_cross*), cross-border divestitures (*cross_sell*), unrelated acquisitions (*buy_div*), unrelated divestitures (*sell_div*), firm size (*size*), return on assets (*ROA*), financial leverage (*leverage*), revenue growth (*growth*) and growth in earnings per share (*eps_growth*).

Panel A: Impact on market-to-book					
	[ALL]	[HOME- REGION]	[BI- REGIONAL]	[HOST- REGION]	[GLOBAL]
MTB	0.773***	0.767***	0.800***	0.774***	0.903***
risk	0.003	-0.037	0.658	-0.003	0.649
buy_cross	0.507***	0.282	-0.736	0.714***	0.391*
sell_cross	-0.092	-0.071	0.617	0.609	-2.775***
size	-0.084	-0.087	-0.375	-0.058	0.009
leverage	0.031	0.061**	-0.053*	-0.029	-0.188***
growth	0.000	0.000	0.006	0.001	-0.000
eps_growth	-0.000	-0.000	0.001	-0.000	0.000
ROA	0.026***	0.025**	0.003	0.028**	0.003
Constant	1.169	1.231	4.356*	0.887	0.265
R-squared	0.579	0.576	0.589	0.652	0.791
N	13712	10390	480	1787	1055

Panel B: Impact on risk					
	[ALL]	[HOME- REGION]	[BI- REGIONAL]	[HOST- REGION]	[GLOBAL]
MTB	-0.000	0.000	0.002	-0.008	-0.000
risk	0.922***	0.929***	0.934***	0.905***	0.956***
buy_cross	-0.040***	0.000	-0.011	-0.110***	0.003
sell_cross	0.002	-0.001	0.044	-0.041	-0.013
size	0.000	-0.002	-0.002	0.008	-0.002
leverage	0.000	-0.000	-0.000	0.017	-0.001
growth	-0.000	-0.000	-0.001	-0.001	0.000
eps_growth	0.000	-0.000	0.000	0.000	-0.000
ROA	0.001	-0.000***	-0.001	0.008***	-0.000
Constant	0.009	0.036***	0.052	-0.165	0.035**
R-squared	0.856	0.869	0.876	0.856	0.818
N	13387	10155	468	1734	1030

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. The impact of diversification across industry on valuation levels and risk

The table reports two equations of the panel VAR. Panel A shows the impact on market-to-book, whereas Panel B focuses on cash flow risk. All variables used in the models are lagged by one period to ensure weak exogeneity. The estimation refers to an equation-by-equation random effects model. The R-squared refers to the overall R-squared. The models also consider the degree of product diversification and interaction terms. The table refers to the market-to-book multiple (*MTB*), cash flow risk (*risk*), regional sales (*regional*), cross-border acquisitions (*buy_cross*), cross-border divestitures (*cross_sell*), unrelated acquisitions (*buy_div*), unrelated divestitures (*sell_div*), firm size (*size*), return on assets (*ROA*), financial leverage (*leverage*), revenue growth (*growth*) and growth in earnings per share (*eps_growth*).

Panel A: Impact on market-to-book					
	[ALL]	[HOME- REGION]	[BI- REGIONAL]	[HOST- REGION]	[GLOBAL]
MTB	0.775***	0.770***	0.785***	0.793***	0.924***
risk	-0.014	-0.048	1.765	-0.017	0.856*
buy_div	6.787***	7.382***	-5.013	0.648	4.555
sell_div	2.159	1.586	10.686	1.124	-0.080
inter_buy	-11.108***	-11.896**	-1.015	-2.471	-7.947
inter_sell	-2.894	-2.258	-50.470	43.635***	-19.158*
product_div	0.197	0.199	-0.246	-0.190	0.100
size	-0.089	-0.103	-0.398	-0.085	0.038
leverage	0.029	0.058*	-0.054*	-0.080	-0.189***
growth	0.000	0.000	0.003	0.002	-0.000
eps_growth	-0.000	-0.000	0.002	-0.000	0.000
ROA	0.026***	0.024*	-0.002	0.028**	0.002
Constant	1.155	1.313	4.681*	1.200	-0.153
R-squared	0.580	0.578	0.592	0.646	0.783
N	13695	10373	480	1787	1055

Panel B: Impact on risk					
	[ALL]	[HOME- REGION]	[BI- REGIONAL]	[HOST- REGION]	[GLOBAL]
MTB	-0.000	0.000	0.002*	-0.009	-0.000
risk	0.923***	0.929***	0.908***	0.907***	0.957***
buy_div	-0.008	0.000	-0.920	0.140	0.038
sell_div	-0.100	0.019	-0.915*	-0.227	0.139
inter_buy	0.012	-0.029	0.334	-0.088	0.029
inter_sell	0.137	-0.033	3.365**	-3.530*	-0.203
product_div	0.010	0.001	0.025	0.102	0.010
size	-0.001	-0.001	-0.002	0.005	-0.002
leverage	0.000	-0.000	-0.000	0.019	-0.000
growth	-0.000	-0.000	-0.001*	-0.001	0.000
eps_growth	0.000	-0.000	0.000	0.000	-0.000
ROA	0.001	-0.000***	-0.001	0.009***	-0.000
Constant	0.013	0.035***	0.035	-0.182	0.026
R-squared	0.855	0.869	0.880	0.855	0.818
N	13370	10138	468	1734	1030

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$