International diversification and the market value of new product

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Journal of International Management 17 (2011) 333–347 Contents lists available at ScienceDirect Journal of International Management International diversi? cation and the market value of new product introduction Chi-Feng Wang a, 1, Li-Yu Chen b,? , Shao-Chi Chang c, 2 a b c Department of Business Administration, National Yunlin University ofScience and Technology, Taiwan Department of Management, Fo Guang University, Taiwan Institute of International Business, National Cheng Kung University, Taiwan article info Article history: Received 11 January 2011

Received in revised form 31 March 2011 Accepted 31 March 2011 Available online 2 May 2011 Keywords: International diversi? cation New product introduction Technological capability Marketing capability Event study abstract Although previous studies on international diversification are plentiful, they mainly focus on the effect of international diversification on overall firm performance, and the results are mixed. This study extends this line of research and explores the impact of international diversification on new product performance.

Specifically, we ask if international diversification explains the stock market reactions to new product introduction (NPI) announcements. We find an inverted-U-shaped relationship between international diversification and the announcement returns of NPIs, revealing that the market value of NPIs initially improves and then declines with increasing international diversification. The results also show that intangible assets, such as technological and marketing capabilities, positively moderate the

relationship between international diversification and the market value of NPIs.

Our study not only highlights the importance of considering both sides of international diversification in affecting investors' assessments of corporate new product strategies, but also shows the possibility of internal capabilities in changing the fixed relationship between international diversification and the market value of new products. © 2011 Elsevier Inc. All rights reserved. 1. Introduction According to the theory of foreign direct investment (FDI) (Caves, 1996; Dunning, 1988; Hymer, 1976) and portfolio theory (Jacquillat and Solnik, 1978; Lessard, 1973, 1976; Solnik, 1974), international diversi? ation will lead to higher ? rm value. However, existing studies examining the impact of international diversi? cation on ? rm performance have yielded inconclusive results. The results on the relationship between international diversi? cation and ? rm performance has been found to be positive (Delios and Beamish, 1999; Grant, 1987; Rugman et al. , 2008), negative (Collins, 1990; Zaheer and Mosakowski, 1997), U-shaped (Capar and Kotabe, 2003; Gaur and Kumar, 2009; Lu and Beamish, 2001), inverted-U-shaped (Brock et al. , 2006; Garbe and Richter, 2009; Gomes and Ramaswamy, 1999; Hitt et al. 1997) and horizontal-S-shaped (Contractor et al. , 2003; Lu and Beamish, 2004; Ruigrok et al. , 2007). To better understand the in? uence of international diversi? cation, we extend this line of research by studying the impact of international diversi? cation on new product performance. Speci? cally, we test if international diversi? cation explains the stock ? Corresponding author at: Present address: Department of Management, Fo Guang University, No. 160, Linwei Rd. , Jiaosi, Yilan County 26247, Taiwan.

Tel. : + 886 3 9871000 23816. E-mail addresses:net. tw (C. -F. Wang),fgu. edu. w (L. -Y. Chen),ncku. edu. tw (S. -C. Chang). 1 Present address: Department of Business Administration, National Yunlin University of Science andTechnology, No. 123, University Road, Section 3, Douliou, Yunlin 64002, Taiwan. Tel. : + 886 5 5342601x5245. 2 Present address: Institute of International Business, National Cheng Kung University, No. 1, University Road, 701, Tainan, Taiwan. Tel. : + 886 6 2757575x53506. 1075-4253/$ – see front matter © 2011 Elsevier Inc. All rights reserved. doi: 10. 1016/j. intman. 2011. 03. 002 334 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 arket responses to new product introduction (NPI) announcements. NPIs are an important dimension of innovation output. 3 Firms with the ability to introduce new products are signaled as those with the opportunity for differentiation and future earnings (Chaney et al. , 1991; Kleinschmidt and Cooper, 1991; Subramaniam and Venkatraman, 2001). In order to improve the performance of NPIs, many ? rms are engaged in international diversi? cation activities (Kogut and Zander, 1993; Peng and Wang, 2000). Previous studies have documented that international diversi? cation comes with both bene? s and costs (Contractor et al. , 2003; Lu and Beamish, 2004; Ruigrok et al. , 2007). We suggest that these bene? ts and costs might create both opportunities and challenges for ? rms to develop new products, and hence in? uence investors' assessment of the new products introduced by ? rms. International diversi? cation may have positive effects on NPIs. For example, it allows ? rms to reach outside their domestic boundaries, providing them with more opportunities to gain new ideas in terms of the types of new

products that can be developed (Hitt et al. , 1997). Internationally diversi? ed ? ms also have better access to the resources resident in foreign countries that may be necessary for producing these new products (Craig and Douglas, 2000; Peng and Wang, 2000). Furthermore, international diversi? cation creates the bene? t of economies of scale by ef? ciently leveraging the initial investments on new products over a broader market base (Subramaniam and Venkatraman, 2001). In spite of the bene? cial effects of international diversi? cation, we suggest that international diversi? cation may also entail disadvantages when it comes to introducing new products. For instance, cross-national distances increase the dif? ulty for internationally diversi? ed ? rms to transfer technological knowledge between countries. Differential environmental settings among countries might also constrain the ? rm's ability to absorb and apply resources towards new product development. In such cases, new products are expected to be less worthwhile for introducing ? rms with international diversi? cation activities. In addition to investigating the direct impact of international diversi? cation on the stock market reactions to NPI announcements, we postulate that investors' assessments of the value of new products may depend on a ? m's internal capabilities. Extending previous research documenting the importance of technological and marketing capabilities in determining new product success (e. g. , Cooper and Kleinschmidt, 1987; Yeoh and Roth, 1999), we argue that both marketing and technological capabilities assist in enhancing the bene? ts of international diversi? cation while simultaneously restricting its drawbacks with regard to the introduction of new products. We test our

hypotheses by measuring the stock market responses to NPI announcements using the event-study methodology framework.

The events of NPI announcements are collected for the period 1997–2005. Under the assumption of the ef? cient markets hypothesis (Fama, 1970), NPI announcements bring unanticipated information into ? nancial markets that may change the market value assessments of the announcing ? rms. In response to the new information, changes in stock prices occur, which represent investors' revision of their expectation with regard to the net present value of a ? rm's risk-adjusted expected cash ? ow generated by the new products, or stated differently, the investors' expectation of the wealth impact of NPIs.

This paper is organized as follows: Section 2 provides the theoretical background and develops the hypotheses. Section 3 introduces the sample and methodology. The empirical results are presented in Section 4. Finally, Section 5 contains the discussion and concluding remarks of this study. 2. Theoretical background and hypotheses International diversi? cation has been suggested by FDI theory and portfolio theory to provide ? rms with bene? ts ranging from the ability to realize scale economies (Grant, 1987; Porter, 1986), the possibility to spread investment risks over different countries (Kim et al. 1993), the potential to arbitrage factor cost differentials across multiple locations (Kogut, 1985) and the opportunity to access resources resident in foreign countries (Hitt et al. , 1997). However, there is considerable theoretical evidence that international diversi? cation comes with both bene? ts and costs. We suggest that that these bene? ts and costs

that accompany foreign expansion may create both opportunities and challenges for ? rms in terms of developing new products, and thereby affect the stock market reactions to NPI announcements.

In this section, we review various theoretical domains in order to identify the channels through which international diversi? cation might in? uence value creation for ? rms in the context of NPIs. 2. 1. Effects of international diversi? cation International diversi? cation provides several advantages towards developing new products. First, international diversi? cation offers opportunities for ? rms to gain new and diverse ideas from a variety of perspectives (Hitt et al. , 1997). Being exposed to heterogeneous customers, technology, cultures, and competitive practices, internationally diversi? d ? rms are able to learn from the experience in foreign operations to ? nd new solutions to bettering product design and improving the quality of manufacturing know-how (Craig and Douglas, 2000). For example, the launch of a new cordless telephone by Sanyo, which had been adjusted to better meet the phone use habits of American consumers (Barkema and Vermeulen, 1998), consequently expanded the company's sales in the U. S. market. 3 Prior studies have used several ways to measure the performance of innovation, which includes R intensity (Hill and Snell, 1988; Hitt et al. 1997), number of NPIs (Cardinal and Opler, 1995; Hitt et al. , 1996) and number of patents (Francis and Smith, 1995). Though they have provided valuable insights, the measures they developed have some limitations in capturing the true value of innovation (Chaney et al. , 1991; Schankerman and Pakes, 1986). For example, R intensity is more related to the input value of innovation but does not directly measure the output value of innovation.

Furthermore, numbers of NPIs or patents only measure the quantity of inventive output without considering the quality of innovation.

As well, patent counts often represent a very noisy measure of the underlying value of innovation because most patents are not worth anything. The measure used in our study allows us to directly measure the wealth effect of innovation, rather than only considering the quantity of inventive output as has been done in prior studies. C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 335 International diversi? cation also allows ? rms to gain access to resources that may only be available in foreign markets but not frequently obtainable in the home countries to develop new products (Peng and Wang, 2000).

By tapping into the technological skills and knowledge that originates from other countries, multinational ? rms may be able to successfully increase their technological strength in developing new products (Hitt et al. , 1997; Kotabe, 1990; Peng and Wang, 2000; Subramaniam and Venkatraman, 2001). Moreover, international diversi? cation provides a ? rm with a wider national network, which helps increase its ability to effectively leverage technological resources and rationalize production processes. These economies of scale can enable the ? m to obtain higher returns from new product innovations (Bartlett and Ghoshal, 1989; Kogut, 1985). Furthermore, the broader market outlets available to new products create higher returns on the sunk costs of innovative spending (Subramaniam and Venkatraman, 2001), while cash ? ows generated from large-scale foreign operations provide ? rms with the resources needed for extra investment in new product

development (Kobrin, 1991; Kotabe, 1990). Notwithstanding the above bene? ts, international diversi? cation can bring challenges to the development of new products. The ? rst challenge comes from the dif? ulty in transferring technological knowledge between countries. The more countries within which the ? rm operates, the larger geographic distance the technological know-how has to be transferred, and the less effective the ? rm will be in developing new products. Furthermore, with increasing diversi? cation, the differences in cultural, economic and technological settings among the countries increase. These differences reduce the effectiveness in assimilating and applying the technological knowledge that is critical for new product development (Chang and Wang, 2007; Hitt et al. 1997); while knowledge diversity can create greater learning value (Inkpen, 2000), differences in knowledge does not guarantee successful learning (Bowman and Helfat, 2001; Chang and Singh, 2000; Szulanski and Winter, 2002). In addition, arguments from the economic law of diminishing returns suggest that the higher degree of international diversi? cation a ? rm is involved in, the more likely it is to be entering markets whose marginal contributions are relatively minor (Contractor et al. , 2003). Beyond a certain point, after already having expanded into the most advantageous markets, the ? m is left with minor or peripheral foreign markets whose resources for and cash ? ow from new product development will exhibit diminishing returns. By drawing on various theoretical perspectives, the above discussions suggest that international diversi? cation not only create opportunities but also impose barriers to the value creation provided by new product innovation. With moderate levels of international diversi? cation, ? rms can capitalize on

valuable bene? ts of knowledge learning, resource access and production ef? ciency in producing new products.

At the same time, economic pro? ts rise as the ? xed costs of new product development are spread across more markets (Kogut, 1985; Porter, 1986). However, ? rms that expand internationally beyond an optimal level may ? nd that the costs of international diversi? cation eventually exceed the bene? ts. Firms at this stage often enter countries that are more geographically and culturally dissimilar, which increases the dif? culties of transferring technological knowledge between countries. The value of new product innovation may also exhibit diminishing returns when international diversi? ation is increased beyond the optimal level. Based on the above, this study proposes a non-linear and inverted-U-shaped relationship between international diversi? cation and the stock market reactions to NPI announcements, suggesting that the market value of NPIs is expected to improve with increasing international diversi? cation at lower levels of international diversi? cation and then decline with increasing international diversi? cation at higher levels of international diversi? cation. For these reasons, we propose our ? rst hypothesis as follows: Hypothesis 1.

The relationship between international diversi? cation and the stock market reactions to NPI announcements is inverted-U-shaped, with a positive slope at lower levels of international diversi? cation and negative at higher levels of international diversi? cation. We utilize event-study methodology to capture the valuation effect of corporate new product strategies. This approach not only permits direct investigation of changes in announcing ?

rms' shareholder value, but is also suited to conduct cross-sectional analysis of the strategies underlying the value creation or destruction (Reuer, 2001).

Applying event-study methodology to NPIs also facilitates comparisons with previous studies on other corporate major strategic events. 4 2. 2. Interaction effects of intangible assets and international diversi? cation Although our theoretical framework should hold for all ? rms, the effect of international diversi? cation on new product performance may depend on ? rms' intangible assets. Scholars in international business have shown that multinational ? rms with greater marketing and technological capabilities may receive higher returns from international expansion (Kotabe et al. , 2002; Lu and

Beamish, 2004). Other researchers also document the importance of marketing and technological capabilities in the success of new products (e. g. , Cooper and Kleinschmidt, 1987; Danneels, 2002; Krasnikov and Jayachandran, 2008; Moorman and Slotegraaf, 1999; Yeoh and Roth, 1999). We make advances in linking these two streams of study by investigating the moderating effect 4 Previous studies have used event-study methodology to test the wealth effect of major corporate events, such as diversi? cation (Doukas and Lang, 2003; Hoskisson et al. , 1991), divestitures (Benou et al. , 2008), alliances (Das et al. 1998; Kale et al. , 2002), regulatory change (Bowman and Navissi, 2003), NPIs (Chaney et al. , 1991; Chen, 2008; Kelm et al. , 1995), R expenditures (Szewczyk et al. , 1996), and patents (Austin, 1993). 336 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 of internal capabilities on the association between

international diversi? cation and the stock market reactions to NPI announcements. We suggest that internationally diversi? ed ? rms that have greater marketing and technological capabilities are more able to extract the bene? ts and reduce the costs of international diversi? ation, resulting in higher returns from NPI announcements. Each moderating effect is discussed independently below. Marketing capability is related to a ? rm's ability to acquire external knowledge through the processes of gathering, interpreting, and using market information (Day, 1994). Though international diversi? cation gives ? rms opportunities to access new knowledge, ? rms that do not have ability to identify customers' needs and to understand the factors that in? uence consumer choice behavior will not be able to achieve better targeting and positioning of its products.

Therefore, ? rms that have invested in developing their marketing capability are more able to integrate the information on consumer needs in diverse markets into new product designs, and thus generate higher returns from the new products (Dutta et al. , 1999). In addition, marketing capability is re? ected in a ? rm's ability to differentiate its products from those of competitors (Kotabe et al. , 2002). A higher level of product differentiation allows a ? rm to charge higher prices for its new products (Day, 1994; Yeoh and Roth, 1999). Furthermore, ? ms that spend moremoneyon advertising and promoting their products are more likely to build successful brands, which are essential to building awareness, reducing the perceived risk that consumers associate with new products, and ? nally increasing the adoption rate of new products introduced (Chandy and Tellis, 2000; Dowling and Staelin, 1994; Sorescu et al. , 2003). This is particularly important for ? rms

that are completely new to foreign customers (Helsen et al. , 1993; Srivastava et al. , 1998). Consequently, we expect that NPIs are expected to be more worthwhile for internationally diversi? d ? rms with greater marketing capabilities, leading to Hypothesis 2: Hypothesis 2. Marketing capability will positively moderate the relationship between international diversi? cation and the stock market reactions to NPI announcements. As mentioned, technological capability is also likely to moderate the effect of international diversi? cation on new product development. Technology capability might represent a ? rm's ability to absorb external knowledge (Penner-Hahn and Shaver, 2005; Tsai, 2001). A ? rm may be able to access certain new knowledge through international diversi? ation, but without the capacity to absorb such knowledge a ? rm may not enhance its capabilities within new product innovation. Since knowledge gained from international markets is often tacit and socially complex (Zahra and Hayton, 2008), ? rms that have established a capability in a particular research skill are better able to interpret and assess the knowledge in that area. Technological capability also refers to a ? rm's ability to apply knowledge gained from foreign markets to commercial ends (Krasnikov and Jayachandran, 2008; Moorman and Slotegraaf, 1999).

Kotabe et al. (2002) have stated that ? rms with greater technological capabilities are more capable of ? nding better product design solutions. The technical risks in developing new products are more likely to be reduced for such ? rms (Kelm et al. , 1995). Furthermore, ? rms with greater technological capability are more able to lower production costs by improving manufacturing processes. Moreover, technological capability helps

? rms to speed up the product development process and satisfy the market more quickly (Rabino and Moskowitz, 1981). Thus, ? ms that have greater technological capabilities are more likely to enhance their revenues in international markets by providing those markets with new products of better quality. Meanwhile, ? rms that leverage their technological capabilities in the greater scope of the global market may enjoy the bene? ts of economies of scale inherent in the innovation process. As a result, we expect that NPIs are more worthwhile for internationally diversi? ed ? rms with greater technological capabilities, leading to Hypothesis 3: Hypothesis 3. Technological capability will positively moderate the relationship between international diversi? ation and the stock market reactions to NPI announcements. 3. Sample and methodology 3. 1. Sample design We test our hypotheses using a sample of NPI announcement events. We collect the sample data on ? rms listed on either the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX) from the Dow Jones News Retrieval Service (DJNRS) database, which provides news-service articles and selected stories from the Wall Street Journal, Dow Jones News Wire, and Barron's. We use the words and phrases commonly used to describe NPIs as keys for a database search routine.

Examples are “ introduce,” “ new product,” “ unveil,” “ launch,” “ received approval,” “ to market,” “ test market,” “ begin selling,” along with other pertinent words and phrases. When a repeat NPI announcement from a ? rm is found in a different publication, the announcement that has the earliest date is chosen as it is the earliest date when the information about the NPI is publicly available (Chaney et al. , 1991; Chen, 2008; Kelm et al. , 1995). The

sample period is from January 1997 to December 2005. Four criteria are used when selecting ? rms for our sample: (1) the announcing ? rms should not have other announcements ? e days before and after the initial announcement date in order to avoid any confounding events that could distort the measurement of the valuation effects; (2) daily stock return information must be available from the Center for Research in Security Prices (CRSP), with a minimum of 50 daily returns in the estimation period; (3) companies' ? nancial information must be available from the COMPUSTAT ? les; and (4) since we want to test the effect of international diversi? cation, only those ? rms with foreign sales data available from the COMPUSTAT ? les are included. C. -F. Wang et al. Journal of International Management 17 (2011) 333–347 337 Following these procedures, we collect a ? nal sample comprising 3061 new product announcements made by 531 ? rms in 57 industries based on the two-digit Standard Industrial Classi? cation (SIC) codes. 5 Table 1 reports the distribution of the sample by year and industry. Our data shows no obvious cluster by time period. In 2004, there are 530 announcements, accounting for 17. 32% of the total. Observations are nearly evenly distributed through the remaining years. However, our sample shows certain levels of concentration in speci? c industries.

The largest concentration comes from electrical equipment (33. 61%), computer equipment (18. 09%), electro-medical instruments (9. 38%), and business services (e. g. , computer programming and the software industry) (7. 19%). These three broad categories constitute nearly 70% of the total sample. As suggested by Chaney et al. (1991), this result is expected since neither the investment opportunities nor their valuation should be random

across industries. 3. 2. Measuring the stock market responses to new product announcements We employ the event study methodology to examine the stock price responses to the announcements of NPIs. This approach has been widely used in the management, accounting, economics and ? nance disciplines to examine the impact of ? rm-speci? c events on ? rm value. The event study approach suggests that, in an ef? cient capital market, the market will adjust and result in returns different from those that are normally expected if the NPI announcement has unexpected information content (Hoskisson et al. , 1991). We use the market model suggested by Brown and Warner (1985) to estimate the abnormal returns to NPI announcements. This model captures a ? rm's stock price change after adjusting for general market-wide factors and the ? m's systematic risk (Bowman, 1983; Brown, 1989; Brown and Warner, 1980, 1985). The abnormal return for ? rm i on day t, ARit, is computed by: ARit = Rit ? E? Rit = It ? 1 ? ; where Rit is ? rm i's actual returns on day t, and It ? 1 represents the information set available to the market about the ? rm at time t ? 1. The expected return for ? rm i on day t is estimated by: E? Rit = It ? 1 ? = ? i + ? i Rmt where Rmt is the return for the market portfolio on day t, ? i is the intercept, and ? i measures the risk or sensitivity of the ? rm's returns relative to the market portfolio. We de? e Day 0 (t = 0) as the initial announcement date. We use the value-weighted CRSP Index as the proxy for the market portfolio. The parameters ? i and ? i are estimated using data for the period of 200 to 60 days before the initial announcement date. The two-day cumulative abnormal returns, CAR (? 1, 0), are estimated by summing the daily abnormal returns over the window period of days ? 1 and 0. The equally weighted cross-sectional average

abnormal returns on ? event day t, ARt , is further calculated by: 1N ? ARt = ? ARit ; N i= 1 where N is the total number of sample NPIs. The cumulative average abnormal return over the period (? , 0) is similarly de? ned. 3. 3. Measuring international diversi? cation We use the entropy index to estimate international diversi? cation. 7 The entropy measure of international diversi? cation is de? ned as ? [Pi* ln(1/Pi)], where Pi is the percentage of sales in geographic segment i, and ln(1/Pi) is the weight of each geographic segment. This measure thus considers both the number of geographic segments in which a ? rm operates and the relative importance of sales contributed by each geographic segment. 5 For the industry classi? cation, we follow Hitt et al. (1997) and use the our-digit SIC codes as the indicator of the industry or business segment that a ? rm operates. Therefore, two variables in this study, namely product diversi? cation and industry R&D intensity, are estimated basing on the four-digit SIC codes. However, for the sake of brevity, we report the sample distribution by industry on the basis of the two-digit SIC codes. 6 Other performance measures of new product strategies that are most commonly used in previous studies include return on assets, return on sales, return on equity, return on investment and pro? t margin (e. g. , Li and Atuahene-Gima, 2001; Moorman, 1995).

However, these accounting measures have several limitations in measuring new product performance (Chang and Wang, 2007; Kalyanaram et al. , 1995; Pauwels et al. , 2004). For example, the differences in accounting policies across ? rms make performance comparisons dif? cult. These measures are also not risk-adjusted as they do not consider business risks associated with individual ? rms when measuring performance, and they are based on

historical accounting data and thus may not adequately re? ect future expected revenue streams resulting from the new products. More importantly, these measures re? ect aggregate ? m performance, making it more dif? cult to directly link them to the effect of speci? c new product introductions. Due to these limitations we employ an event study methodology in order to examine stock price responses to announcements of NPIs. This method captures the ? rm's stock price change after adjusting for the ? rm's systematic risk (Bowman, 1983; Brown, 1989; Brown and Warner, 1980, 1985), as well as re? ects investors' expectations of a ? rm's future cash ? ow related to this new product (Chaney et al. , 1991; Chen, 2008; Chen et al. , 2002; Kelm et al. , 1995). 7 Previous studies have used several proxies of international diversi? ation. The most commonly used measures are the ratio of foreign sales to total sales (Grant, 1987; Tallman and Li, 1996), the ratio of foreign assets to total assets (Daniels and Bracker, 1989; Ramaswamy, 1995), numbers of foreign countries in which a ? rm has subsidiaries (Delios and Beamish, 1999; Tallman and Li, 1996) or a composite index encompassing these three dimensions (Gomes and Ramaswamy, 1999; Sullivan, 1994). However, these measures only capture the extent but not the distribution of international diversi? cation. In this study, we follow Hitt et al. (1997) and use the entropy measure of international diversi? ation to account for the extent of sales in global markets and their weighting. C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 338 Table 1 Distribution of new product introduction. Panel A. Sample distribution by year Year Number of announcements Percent of sample (%) 1997 1998 1999 2000 2001 2002

2003 2004 2005 Total 354 279 370 313 232 247 391 530 345 3061 11. 56 9. 11 12. 08 10. 22 7. 58 8. 07 12. 77 17. 32 11. 30 100. 00 Panel B. Sample distribution by industry Two-digit SIC code Industry group 01 12 13 15 16 17 20 21 22 23 24 25 26 27 28 29 30 31 33 34 Agricultural production crops

Coal mining Oil and gas extraction Building construction: general contractors Heavy construction other than building construction contractors Construction: special trade contractorsFoodand kindred products Tobacco products Textile mill products Apparel, ? nished prdcts from fabrics and similar materials Lumber and wood products, except furniture Furniture and ? xtures Paper and allied products Printing, publishing, and allied industries Chemicals and allied products Petroleum re? ning and related industries Rubber and miscellaneous plastics products Leather and leather products Primary metal industries

Fabricated metal products, except machinery and transportation equipment Industrial and commercial machinery and computer equipment Electronic and other electrical equipment and components, except computer equipment Transportation equipment Measuring, analyzing, and controlling instruments; photographic, medical and optical goods Miscellaneous manufacturing industries Railroad transportation Motor freight transportation and warehousing Transportation by air Pipelines, except natural gas Transportation services Communications Electric, gas, and sanitary services Wholesale trade: durable goods Wholesale trade: non-durable goods

Building materials, hardware, garden supply, and mobile home dealers General merchandise stores Food stores Apparel and accessory stores Home

furniture, furnishings, and equipment stores Eating and drinking places Miscellaneous retail Depository institutions Non-depository credit institutions Security and commodity brokers, dealers, exchanges, and services Insurance carriers Insurance agents, brokers, and service Real estate Holding and other investment of? ces Hotels, rooming houses, camps, and other lodging places Personal services 35 36 37 38 39 40 42 45 46 47 48 49 50 51 52 53 54 56 57 58 59 60 61 62 63 64 65 67 0 72 Number of announcements Percent of sample (%) 1 1 8 1 1 1 28 4 2 2 3 6 13 76 118 2 9 2 23 21 0. 03 0. 03 0. 26 0. 03 0. 03 0. 03 0. 91 0. 13 0. 07 0. 07 0. 10 0. 20 0. 42 2. 48 3. 85 0. 07 0. 29 0. 07 0. 75 0. 69 554 1029 18. 09 33. 61 72 287 2. 35 9. 38 41 4 2 144 1 1 120 20 19 10 2 3 3 8 6 14 13 2 18 17 34 5 3 9 6 6 1. 34 0. 13 0. 07 4. 70 0. 03 0. 03 3. 92 0. 65 0. 62 0. 33 0. 07 0. 10 0. 10 0. 26 0. 20 0. 46 0. 42 0. 07 0. 59 0. 56 1. 11 0. 16 0. 10 0. 29 0. 20 0. 20 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 339 Table 1 (continued) Panel B. Sample distribution by industry

Two-digit SIC code Industry group 73 78 79 80 82 87 Business services Motion pictures Amusement and recreation servicesHealthservices Educational services Engineering, accounting, research, management, and related services Nonclassi? able establishments 99 Total Number of announcements Percent of sample (%) 220 13 4 2 1 10 7. 19 0. 42 0. 13 0. 07 0. 03 0. 33 36 3061 1. 18 100. 00 As data is not available at the country level, we use sales of regional markets to measure international diversity (as used by e. g. , Hirsch and Lev, 1971; Hitt et al. , 1997; Miller and Pras, 1980). Following Hitt et al. 1997), we group foreign markets into four regions based on economic and political conditions: Africa, Asia and the Paci? c, Europe,

and the Americas. Although not perfect, this approach allows us to focus on between-market heterogeneity (Kim et al. , 1989). The international market sales data are from the COMPUSTAT geographic segment tapes for the ? scal year preceding the announcements. 8 3. 4. Measuring intangible assets We measure marketing capability as the average marketing intensity (the ratio ofadvertisementexpenditures to net sales) for the three ? scal years prior to the announcements. 9 We suggest that ? ms who invest more in marketing activities are considered to have superior marketing capabilities. We measure technological capability as the average R&D intensity (the ratio of R&D expenditures to net sales) for the three ? scal years prior to the announcements. We suggest that ? rms outspending their competitors in R&D are considered to have greater technological capabilities. We scale the measures of ? rm capabilities by ? rm size in order to ensure that the capability measure does not merely re? ect higher levels of ? nancial resources of large-scaled ? rms (following Moorman and Slotegraaf, 1999). 3. 5. Other variables

Other potential variables that could affect the value of NPIs are controlled. The ? rst is ? rm size, measured by the natural logarithm of total sales of the announcing ? rm for the ? scal year preceding the announcement (following Kotabe et al. , 2002; Lu and Beamish, 2004). We next control for a ? rm's leverage ratio, measured as the ratio of total debt to total assets for the ? scal year prior to the announcement (following Chen et al. , 2002; Chen, 2008). We also control for the degree of product diversi? cation for the ? scal year preceding the announcement. Product diversi? cation is measured by the entropy index (? Pi * ln(1/Pi)], where Pi is the percentage of ? rm sales in

business segment i, and ln(1/Pi) is the weight of each segment). Following Hitt et al. (1997), we de? ne business segments as those having the same four-digit SIC codes. The product-speci? c effects are also controlled. This is necessary as some researchers have suggested that high-newness products are expected to create better opportunities for product differentiation and competitive advantage (Kleinschmidt and Cooper, 1991; Meyer and Roberts, 1986), and as such, high-newness products should receive a larger market value than updates of existing products.

Furthermore, scholars have argued that ? rms introducing multiple products are more competitive in the product market and seize more market share than those announcing single products. This implies that ? rms announcing multipleproducts announcers may appropriate much of the bene? ts associated with new products, and are thus expected to experience a larger increase in market value than those announcing a single product (Acs and Audretsch, 1988; Hendricks and Singhal, 1997). Moreover, researchers have documented that the ? rst to introduce a new product in the marketplace usually enjoys ? st-mover advantages stemming from the creation of entry barriers and switching costs, and from high consumer recognition and preference to the ? rst product (Jovanovic and MacDonald, 1994; Lee et al. , 2000). Therefore, ? rst-moving ? rms are predicted to gain a higher announcement return at the time of NPIs than followers do. The aforementioned ? rms that introduce high-newness and multiple products or ? rms that are the ? rst to introduce new products are suggested to obtain sustained competitive advantage. This argument corresponds to Williamson (1999) that ? ms getting ahead of their competitors by providing multiple

and new technology, products and business solutions have more opportunities to ensure lasting sales growth. We identify these product announcement types by using structural content analysis on the news content (as in Chaney et al. , 1991; Lee et al. , 2000; Firth and Narayanan, 1996). Based on the analysis of the news content, we create three dummy variables: NEWNESS, MULTIPLE and TIME. 8 The main reason for using data one year before the announcements is to capture the most recent impact of a ? m's attributes on the market reactions to new product introductions. Several independent variables are measured by the data one year preceding the announcements, including international diversi? cation, ? rm size, debt-to-asset ratio, product diversi? cation and two industry sector dummy variables. 9 Since the values of advertising and R&D expenditures tend to ? uctuate substantially from year to year, we use the 3-year average values of advertising intensity, R&D intensity and industry R&D intensity to reduce the chance that a random and extreme value in one year disproportionately in? ences our measure of intangible assets. 340 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 NEWNESS equals one if the product is highly innovative, and zero if it is an update or an enhancement of an existing product (as in Chaney et al. , 1991; Chen, 2008). MULTIPLE equals one for multiple-products announced simultaneously by a ? rm, and zero for single announcements (as in Chaney et al. , 1991; Chen, et al. , 2002). TIME equals one if the announcing ? rm is the ? rst mover, and zero otherwise (as in Lee et al. , 2000; Chen, 2008).

Finally, we consider two industry-related factors. The ? rst is the technological opportunity of the industry in which the announcing ? rms

operate. Chaney et al. (1991) asserted that the valuation effect of NPIs is higher for ? rms in more technologically based industries, as they are considered to have more innovation opportunities and greater potential for future growth. In contrast, Kelm et al. (1995) found that investors respond positively to new product announcements by ? rms in less-technology-intensive industries because new product announcements by these ? rms are relatively nexpected by investors. Technological opportunities at the industry level are measured by the average industry R&D intensity (the average values of R&D expenditures divided by net sales for all ? rms in the same four-digit SIC industry) for the three ? scal years prior to the announcements (following Chan et al. , 1990; Kelm et al. , 1995). In addition, we control for the industry-speci? c effect with two dummy variables: MANUFACTURING and SERVICE. MANUFACTURING equals one for announcing ? rms in manufacturing industries, and zero otherwise. SERVICE equals one for announcing ? ms in service industries, and zero otherwise. This is done as several studies have argued that the effect of internationality on performance for manufacturing ? rms is different from that for service ? rms (Capar and Kotabe, 2003; Contractor et al. , 2003). We therefore separate the sample ? rms into service, manufacturing and other industries according to 2-digit SIC codes and apply two industry dummies to control for the industry-speci? c effects. Table 2 presents the means, standard deviations, and correlations for all variables for the sample of NPI announcements. 4. Empirical results

Table 3 provides estimates of abnormal returns around the announcement date and the surrounding days. The results show that innovations such as

NPIs are perceived by investors as value-increasing activities. For the two-day announcement period cumulative abnormal returns, CAR (? 1, 0), the new product announcers experience a positive cumulative average abnormal return of 0. 194%, signi? cant at the 1% con? dence level. No signi? cant abnormal returns are observed preceding and following the announcement period. As a result, we use CAR (? 1, 0) as the dependent variable in the following regression analysis.

Our results are consistent with prior studies (e. g. , Chaney et al. , 1991; Chen, 2008; Chen et al. , 2002; Kelm et al. , 1995). Table 4 reports the regression results with the dependent variable CAR (? 1, 0). We present the results without centering the variables in the ? rst ? ve models, and results with centering the variables on their means in the latter ? ve models. 10 Models 1 and 6 are baseline models that include only the control variables and two measures of intangible assets. Among the control variables, leverage ratio is found to be positively associated with CAR (? 1, 0), though insigni? cant in some models.

This result suggests that higher levels of debt lower the expected costs of free cash ? ow (Jensen, 1986), and new products announced by ? rms with a higher leverage ratio are therefore perceived as more worthwhile. Of the two ? rm-speci? c assets variables, both R&D and advertising intensities have a signi? cant and positive impact in most models. Moreover, industry R&D intensity is found to be signi? cantly negatively associated with CAR (? 1, 0). This result suggests that investors respond positively to new product announcements by ? rms in less technology-intensive industries because

new product announcements by these ? ms are relatively unexpected by investors (Kelm et al. , 1995). Other control variables are not found to have signi? cant explanatory power in terms of the variation in announcement abnormal returns. In model 2 (7), we test the impact of international diversi? cation on the stock market reactions to NPI announcements by including the linear and squared terms of international diversi? cation. We ? nd our Hypothesis 1 is strongly supported, as CAR (? 1, 0) is positively related to the linear term of international diversi? cation and then negatively associated to the squared term of international diversi? cation.

This result suggests an inverted-U-shaped relationship between international diversi? cation and the market value of NPIs. Models 3 (8), 4 (9) and 5 (10) test the moderating effects of intangible assets by including the interaction term of international diversi? cation and advertising intensity and the interaction term of international diversi? cation and R&D intensity. 11 Model 3 (8) tests the interaction effect between international diversi? cation and marketing capability. The statistically signi? cant and positive coef? cient of the interaction term suggests that the market value of NPIs increases when internationally diversi? d ? rms have greater marketing capacities. Thus, Hypothesis 2 is supported. Model 4 (9) tests the interaction effect between international diversi? cation and technological capability. We also ? nd a statistically signi? cant and positive coef? cient of the interaction term. Thus, Hypothesis 3 is supported. To test the robustness of these ? ndings, we simultaneously include the interaction of international diversi? cation and advertising intensity and the interaction of international diversi? cation and

R&D intensity in model 5 (10). Results remain unchanged to those in models 3 (8) and 4 (9).

It is noted that the “ main effects” between international diversi? cation and the abnormal returns of NPIs remain robust in all models with the addition of the interaction terms. To gain further insights into our ? ndings, we construct Figs. 1 and 2 by drawing on the results of models 3 and 4. We use CAR (? 1, 0) as the measurement of market value of NPIs. When illustrating the impact of advertising intensity (R&D intensity) and 10 Since some variables are constructed from other variables, we follow Aiken and West (1991) by subtracting each variable from its mean value in the sample to minimize their collinearity. 11

To test the robustness of our conclusion, we re-examine the regression analysis by incorporating the interaction of quadratic terms of international diversi? cation and intangible asset proxies. Our conclusions remain unchanged. Variables a Mean s. d. Min Max 1. Two-day announcementperiod abnormal return(%)a 2. International diversi? cation 3. Advertising intensity 4. R&D intensity 5. Product diversi? cation 6. Firm size b 7. Debt-to-asset ratio 8. Newness 9. Multiple 10. Time 11. Industry R&D intensity 12. Service industry 13. Manufacturing industry 0. 194 0. 037 ? 0. 242 0. 230 0. 653 0. 012 0. 081 0. 816 8. 541 0. 00 0. 827 0. 302 0. 359 0. 236 0. 236 0. 748 0. 424 0. 022 0. 148 0. 659 1. 860 0. 149 0. 379 0. 459 0. 480 0. 390 0. 425 0. 434 0. 000 0. 000 0. 000 0. 000 ? 0. 781 0. 000 0. 000 0. 000 0. 000 0. 000 0. 000 0. 000 0. 000 1. 382 0. 317 4. 696 2. 533 12. 060 1. 099 1. 000 1. 000 1. 000 2. 334 1. 000 1. 000 2 3 4 5 6 7 8 1. 000 ? 0. 033* 1. 000 0. 102*** ? 0.

071*** 1. 000 ? 0. 004 ? 0. 042** ? 0. 016 1. 000 0. 149*** 0. 092*** ? 0. 158*** 0. 399*** 1. 000 ? 0. 111*** 0. 001 ? 0. 090*** 0. 052*** 0. 075*** 1. 000 0. 036** ? 0. 002 0. 010 ? 0. 003 0. 027 ? 0. 021 1. 000 9 0. 076*** 0. 050*** 0. 015 ? 0. 024 0. 016 ? 0. 100*** 0. 33* 1. 000 The two-day period (? 1, 0) abnormal return is estimated by summing up abnormal returns from the day before (day ? 1) to the announcement date (day 0). Firm size is measured by the natural logarithm of net sales. ***p b 0. 01, **pb0. 05, *pb0. 1. b 10 11 12 13 0. 045** ? 0. 022 0. 056*** 0. 039** 0. 024 ? 0. 050*** 0. 170*** ? 0. 040** 1. 000 0. 257*** ? 0. 083*** 0. 252*** ? 0. 042** ? 0. 188*** ? 0. 098*** 0. 031* 0. 039** 0. 055*** 1. 000 ? 0. 382*** 0. 000 ? 0. 137*** ? 0. 206*** ? 0. 020 0. 199*** ? 0. 007 ? 0. 147*** ? 0. 064*** ? 0. 151*** 1. 000 0. 342*** 0. 017 0. 143*** 0. 151*** ? 0. 017 ? 0. 222*** . 009 0. 147*** 0. 068*** 0. 166*** ? 0. 960*** 1. 000 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 Table 2 Descriptive statistics and correlations. 341 342 C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 Table 3 Abnormal returns for new product introduction announcements. Event day Mean AR (%) t-statistic ? 10 ? 9 ? 8 ? 7 ? 6 ? 5 ? 4 ? 3 ? 2 ? 1 0 [? 1, 0] +1 +2 +3 +4 +5 +6 +7 +8 +9 + 10 ? 0. 023 ? 0. 005 0. 025 ? 0. 016 ? 0. 025 ? 0. 005 0. 047 0. 001 ? 0. 039 0. 093 0. 101 0. 194 ? 0. 038 0. 058 0. 081 ? 0. 056 0. 027 ? 0. 073 ? 0. 055 0. 053 ? 0. 025 ? 0. 054 ? 0. 450 0. 092 0. 471 ? 0. 309 ? 0. 477 ? 0. 099 0. 888 0. 003 ? 0. 731 1. 918* 2. 038** 2. 885*** ? 0. 756 1. 086 1. 329 ? 1. 138 0. 529 ? 1. 403 ? 1. 078 1. 118 ? 0. 471 ? 0. 972 (0. 653) (0. 927) (0. 638) (0. 758) (0. 633) (0. 921) (0. 375) (0. 998) (0. 465) (0. 055) (0. 042) (0. 004) (0. 450) (0. 278) (0. 184) (0. 255) (0. 597) (0. 161) (0. 281) (0.

264) (0. 638) (0. 331) ***p b 0. 01, **p b 0. 05. Values in parentheses are p-values. international diversi? cation on CAR (? 1, 0), we hold other control variables at the average level. If the control variables are dummy ones, we substitute these variables with their modes. 2 Both ? gures provide supportive evidence for our hypotheses. First, the relationship between international diversi? cation and the market value of NPIs is found to be inverted-U-shaped, with the slope positive at lower levels of international diversi? cation but negative at higher levels of international diversi? cation. For example, in Fig. 1, for ? rms with no marketing capability, at the initial stage, there is a positive impact on the market value of NPIs with an increase of 0. 62% in CAR (? 1, 0) when the level of international diversi? cation increases from zero to 0. 8. Beyond this threshold of 0. , a higher level of international diversi? cation is associated with a decreasing CAR (? 1, 0). In Fig. 2, for ? rms with no technological capability, there is a positive impact on the market value of NPIs with an increase of 0. 63% in CAR (? 1, 0) when the level of international diversi? cation increases from zero to 0. 8. Beyond this point, more international diversi? cation results in lower market values of NPIs. In addition, these graphs illustrate the performance differences across ? rms with different levels of intangible assets. For example, in Fig. 1, for a ? rm with a degree of international diversi? cation of 0. and a level of marketing capability of 0. 3, there is an expected CAR (? 1, 0) that is almost 0. 89% higher than that for a ? rm at the same level of international diversi? cation but with the marketing capability of 0. 1; at a degree of international diversi? cation of 1. 2, there is an expected improvement in CAR (? 1, 0) of 3. 25% when the level of marketing capability increases from 0. 1 to 0. 3. The

same procedure can be used to explain the moderating effect of technological capability. In Fig. 2, for a ? rm with a level of international diversi? cation of 0. 4 and a level of technology capability of 1. , there is an expected CAR (? 1, 0) that is 2. 09% higher than that for a ? rm at the same level of international diversi? cation but with the technological capability of 0. 4; at a degree of international diversi? cation of 1. 2, there is an expected improvement in CAR (? 1, 0) of 4. 92% when the technology capability of a ? rm increases from 0. 4 to 1. 6. 5. Discussion and conclusions This paper examines the importance of international diversi? cation in explaining the stock market reactions to NPI announcements. Using NPI announcements from the period 1997–2005, we found an inverted-U-shaped relationship between international diversi? ation and the market value of NPIs, with a slope positive at lower levels of international diversi? cation but negative at higher levels of international diversi? cation. This relationship is moderated by the intangible assets possessed by internationally diversi? ed ? rms. We ? nd that announcing ? rms with greater technological and/or marketing capabilities achieve higher abnormal returns from NPIs. The main effects of the international diversi? cation variables still hold after the inclusion of these moderating factors. In view of recent research having suggested a sigmoid performance effect of internationalization (Contractor et al. 2003; Lu and Beamish, 2004), we test our hypotheses in the framework of an S-shaped relationship by simultaneously adding linear, squared and cubed terms of international diversi? cation in the regression. However, our sample does not reveal the S-shaped association between international diversi? cation and the market value of NPI. 12 The equations for the graphs

presented in Figs. 1 and 2 are as follows, respectively: CAR (? 1, 0) = ? 0. 0037 + 0. 0157 * ID ? 0. 0099 * ID2 ? 0. 0147 * AD + 0. 1476 * ID * AD and CAR (? 1, 0) = ? 0. 0049 + 0. 0168 * ID ? 0. 0112 * ID2 + 0. 0056 * RD + 0. 295 * ID * RD, where ID = international diversi? cation; ID2 = International diversi? cation squared; AD = advertising intensity; RD = R&D intensity. C. -F. Wang et al. / Journal of International Management 17 (2011) 333–347 343 Table 4 Regression analysis of new product introduction on international diversi? cation. Un-centered results Centered results Independent variables Model 1 Model 2 Intercept ? 0. 0005 (? 0. 072) ? 0. 0042 ? 0. 0017 ? 0. 0037 ? 0. 0009 (? 0. 591) (? 0. 233) (? 0. 525) (? 0. 122) 0. 0178 0. 0157 0. 0168 0. 0143 (3. 156)*** (2. 737)*** (2. 967)*** (2. 486)** ? 0. 0099 ? 0. 0099 ? 0. 0112 0. 0113 (? 2. 188)** (? 2. 175)** (? 2. 434)** (? 2. 455)** International diversi? cation International diversi? cation squared International diversi? cation ? Advertising intensity International diversi? cation ? R&D intensity Firm size a Debt-to-asset ratio Product diversi? cation Advertising intensity R&D intensity Newness Multiple Time Industry R&D intensity Service Manufacturing Adjusted R2 F value Number of observations a Model 3 Model 4 0. 1476 (2. 236)** ? 0. 0001 ? 0. 0002 (? 0. 336) (? 0. 484) 0. 0072 0. 0071 (1. 531) (1. 516) ? 0. 0001 0. 0000 (? 0. 069) (0. 037) 0. 0667 ? 0. 0147 (2. 100)** (? 0. 04) 0. 0090 0. 0087 (1. 878)* (1. 832)* ? 0. 0003 ? 0. 0002 (? 0. 182) (? 0. 138) 0. 0016 0. 0016 (1. 085) (1. 055) ? 0. 0007 ? 0. 0006 (? 0. 466) (? 0. 407) ? 0. 0034 ? 0. 0032 (? 1. 804)* (? 1. 686)* 0. 0020 ? 0. 0007 (0. 032) (? 1. 121) ? 0. 0005 ? 0. 0015 (? 0. 079) (? 0. 252) 0. 0051 0. 0064 2. 20*** 2. 41*** 3061 3061 Model 6 0. 0036 (0. 637) 0. 1629 (2. 458)** 0. 0295 0. 0003 (0. 676) 0. 0073 (1. 569) ? 0. 0009 (? 0. 744)

0. 0527 (1. 673)* 0. 0093 (1. 941)* ? 0. 0004 (? 0. 195) 0. 0017 (1. 141) ? 0. 0006 (? 0. 389) ? 0. 0018 (? 0. 977) ? 0. 0030 (? 0. 519) ? 0. 0012 (? 0. 218) 0. 0005 1. 15 3061 Model 5

Model 7 Model 8 Model 9 0. 0022 0. 0032 0. 0030 0. 0042 (0. 392) (0. 567) (0. 517) (0. 726) 0. 0178 0. 0174 0. 0192 0. 0189 (3. 156)*** (3. 081)*** (3. 375)*** (3. 326)*** ? 0. 0099 ? 0. 0099 ? 0. 0112 ? 0. 0113 (? 2. 188)** (? 2. 175)** (? 2. 434)** (? 2. 455)** 0. 1476 (2. 236)** 0. 0333 (1. 978)** (2. 225)** ? 0. 0001 ? 0. 0002 (? 0. 257) (? 0. 410) 0. 0085 0. 0086 (1. 803)* (1. 824)* ? 0. 0001 0. 0000 (? 0. 102) (0. 012) 0. 0709 ? 0. 0185 (2. 226)** (? 0. 383) 0. 0056 0. 0049 (1. 107) (0. 971) ? 0. 0002 ? 0. 0001 (? 0. 109) (? 0. 051) 0. 0018 0. 0018 (1. 221) (1. 2061) ? 0. 0009 ? 0. 0009 (? 0. 641) (? 0. 99) ? 0. 0046 ? 0. 0046 (? 2. 341)** (? 2. 302)** ? 0. 0005 ? 0. 0016 (? 0. 082) (? 0. 265) ? 0. 0015 ? 0. 0027 (? 0. 252) (? 0. 463) 0. 0060 0. 0077 2. 33*** 2. 58*** 3061 3061 0. 1629 (2. 458)** 0. 0295 0. 0003 (0. 676) 0. 0073 (1. 569) ? 0. 0009 (? 0. 744) 0. 0527 (1. 673)* 0. 0093 (1. 941)* ? 0. 0004 (? 0. 195) 0. 0017 (1. 141) ? 0. 0006 (? 0. 389) ? 0. 0018 (? 0. 977) ? 0. 0003 (? 0. 519) ? 0. 0012 (? 0. 218) 0. 0005 1. 15 3061 Model 10 (1. 978)** ? 0. 0001 ? 0. 0002 ? 0. 0001 (? 0. 336) (? 0. 484) (? 0. 257) 0. 0072 0. 0071 0. 0085 (1. 531) (1. 516) (1. 803)* ? 0. 0001 0. 0000 ? 0. 0001 (? 0. 069) (0. 37) (? 0. 102) 0. 0667 0. 0817 0. 0709 (2. 100)** (2. 517)** (2. 226)** 0. 0090 0. 0087 0. 0249 (1. 878)* (1. 832)* (2. 659)*** ? 0. 0003 ? 0. 0002 ? 0. 0002 (? 0. 182) (? 0. 138) (? 0. 109) 0. 0016 0. 0016 0. 0018 (1. 085) (1. 055) (1. 221) ? 0. 0007 ? 0. 0006 ? 0. 0009 (? 0. 466) (? 0. 407) (? 0. 641) ? 0. 0034 ? 0. 0032 ? 0. 0046 (? 1. 804)* (? 1. 686)* (? 2. 341)** 0. 0020 ? 0. 0007 ? 0. 0005 (0. 032) (? 1. 121) (? 0. 082) ? 0. 0005 ? 0. 0015 ? 0. 0015 (? 0. 079) (?

0. 252) (? 0. 252) 0. 0051 0. 0064 0. 0060 2. 20*** 2. 41*** 2. 33*** 3061

3061 3061 0. 0333 (2. 225)** ? 0. 0002 (? 0. 410) 0. 0086 (1. 824)*