# The Geography of Disclosure: Evidence from Segment Reporting

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**Abstract:** This paper uses a novel approach to examine motives for segment disclosure. It is generally assumed that firms prefer not to disclose disaggregated segment information for proprietary reasons, although there is mixed support for this assertion in empirical work. We develop an approach that uses the location characteristics of geographic segments to empirically identify reasons for withholding or disclosing segments. Using hand-collected segment data around a switch in reporting standards that forced firms to reveal more disaggregated segment information, we find that proprietary as well as agency costs, determine the (non-)disclosure of segments. Firms disclose segments in areas that have high (predicted) economic growth when there are strong incentives to show off to analysts and investors. In addition, firms hide information about segments in areas with high GDP and economic growth, with this effect being stronger when proprietary costs are greater. We also find a higher likelihood of disclosing a geographic segment when entry barriers make it harder for firms to start a business in that area, which is also consistent with proprietary costs preventing disclosure. This paper contributes to the literature on disclosure incentives and explores new ways to measure proprietary costs in a disclosure context.

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## 1. Introduction

This paper investigates whether the characteristics of the location of a firm's segment determine disclosure. Theoretical models of information disclosure typically assume the existence of disclosure costs to explain why firms do not fully disclose all information in their possession. The cost that is most commonly put forward as an example are proprietary costs (Verrecchia 2001), which are the costs of disclosing strategic information to potential competitors that can harm the disclosing firm (Darrough and Stoughton, 1990). However, empirically verifying this assertion proves to be difficult for several reasons. First, many papers have relied on measures of industry concentration or industry profitability (e.g., Harris, 1998; Botosan and Stanford, 2005) as proxies for proprietary costs. However, the relationship between such measures and competition is not clear-cut: for instance, cut-throat competition can exist in highly concentrated industries such as duopolies. In addition, it is unclear whether competition is expected to lead to more or less disclosure: Li (2010) finds that competition from potential entrants leads to more disclosure while competition from existing rivals has the opposite effect on disclosure. Moreover, concentration is often measured inaccurately since most researchers ignore the market share of private firms (Ali, Klasa and Yeung, 2009) and industries are difficult to define (Bhojraj, Lee and Oler 2003). Dedman and Lennox (2009) also find that traditional competition measures are not or at best weakly related to managers' perception of competition.

Second, Berger and Hann (2007) state that many studies ignore that disclosure may be costly for other reasons. For instance, agency costs can lead to non-disclosure of poor performance, whereas proprietary costs more likely lead to non-disclosure of high performance, which is not always taken into account. Berger and Hann (2007) and Bens, Berger and Monahan (2011) show that agency costs are indeed a major determinant of disclosure.

The purpose of this paper is twofold. First, we examine the importance of both agency and proprietary costs to disclosure in the geographic segment disclosure setting. Our choice for this setting is related to our second purpose, namely to develop new proxies for proprietary costs that do not rely on industry concentration or competition. Instead, we look at the characteristics of a segment's location, including the region's economic growth, wealth and entry barriers, as proxies for agency and proprietary costs of disclosure. If agency cost considerations dominate the decision to disclose a segment, we expect firms to show off "good" segments, which we define as segments in wealthier (high GDP) areas or those with high economic growth. In contrast, when proprietary cost considerations are most important, we expect firms to instead hide such segments. We also examine whether entry barriers, measured as the cost and time necessary to start a new firm in a particular region, affect disclosure of a particular segment. Our intuition is that when it is easier for other firms to enter a particular country or region, revealing information about segments in such areas can be more costly, since it gives away strategic information that makes it easier for competitors to enter those markets.

We expect that both proprietary and agency costs play a role in determining disclosure, but also that the importance of these costs varies across firms. We therefore make a distinction between firms that face high agency costs or proprietary costs in our analyses. We expect non-disclosure of "good" segments to bear greater agency costs for firms that are followed more closely by outsiders such as analysts and investors. We also expect that the benefit of disclosing such segments is greater when the overall performance of a firm is low, such as firms that exhibit a loss or have lower growth opportunities. We also predict that firms facing high proprietary costs of disclosing (geographic) information, i.e., those that engage in R&D or depend more on foreign activities, are more likely to hide "good" segments or segments in locations with low entry barriers.

To determine whether firms conceal or disclose segments, we follow the approach in Berger and Hann (2007) and examine a switch in segment reporting standards that forces firms to disaggregate geographic segments.[2] We use the switch from IAS 14 to IFRS 8 in 2009 as our setting, as prior literature has shown that this change in reporting standards resulted in more disaggregated segments (e.g., Crawford, Extance, Helliar and Power, 2012; Nichols, Street and Cereola, 2012; Leung and Verriest, 2013). Under IFRS 8, firms are required to restate their segments for the year prior to adoption, to allow users of financial statements to compare performance across time. This allows us to see which segments are newly disclosed under IFRS 8 for the pre-adoption year, since we also have the original segment disclosures under IAS 14. We interpret newly disclosed segments as segments that management wanted to hide, and segments that are revealed under both standards as those that management wanted to disclose.

We find that, on average, new segments tend to be located in wealthier countries or regions, which is consistent with the existence of proprietary costs that prevent disclosure of "good" segments. We also find that when it is harder for other firms to enter a particular region, segments in those areas are more likely to be disclosed, which also supports the proprietary cost explanation for non-disclosure. When we differentiate our sample based on the magnitude of agency costs firms face, we find that segments in high economic growth areas are more likely to be disclosed when shareholder ownership is less concentrated, when there is higher analyst following and when a firm has low growth opportunities. These results are consistent with the agency cost explanation, where firms have incentives to hide poorly performing segments and show off more attractive segments. When we consider the importance of proprietary costs, we find that firms hide segments in high growth or wealthier areas when their foreign activities are substantial. The intuition behind this finding is that

[2] By disaggregation, we are referring to whether segments are reported at the country, multi-country or continent level.

when foreign operations generate a larger proportion of sales, revealing geographic information to competitors can have a greater effect on the firm's competitive position. We also find that when firms do not engage in R&D, indicating low proprietary costs, they tend to show off segments in high economic growth areas. We continue to find non-disclosure of segments in regions with low entry barriers, irrespective of R&D expenditures or the proportion of foreign sales. This indicates that firms always view disclosure of segments in easy-to-enter regions as costly. Overall, our findings show that both agency and proprietary costs matter in disclosure decisions.

We make two main contributions. First we contribute to the literature on disclosure incentives, and segment disclosure in particular, by confirming that both proprietary and agency costs play important roles in a manager's decision to disclose or withhold information. Our results complement those in Berger and Hann (2007) and Bens et al. (2011), who also find that both types of costs are important drivers of disclosure.

Second, our study demonstrates that the location of a segment and economic characteristics of location are important determinants of segment disclosure. Many cross-country studies in the accounting literature have examined the effect of country institutions and legal regimes on reporting quality or cost of capital (e.g., Ball, Kothari and Robin, 2000; Ball, Robin and Wu, 2003; Burgstahler, Hail and Leuz, 2006; Hail and Leuz, 2006) but we are unaware of studies that have examined the effect of economic country and region characteristics on disclosure, nor any that disaggregate these characteristics to the segment level. This approach provides a new way to measure proprietary costs that does not suffer from the aforementioned measurement issues of concentration or other competition measures. We also contribute by verifying that other proprietary cost proxies used in prior work unrelated to segment disclosure are useful in this setting as well.

The paper proceeds as follows. Section 2 provides theoretical background on the relationship between disclosure and agency or proprietary costs. Section 3 presents our methodology; Section 4 discusses the sample and Section 5 presents the empirical results. Section 6 provides concluding remarks.

## 2. Theoretical Background

Theoretical models in the accounting literature propose that the presence of costs to disclosure result in equilibria where information can be withheld (e.g., Verrecchia, 1983). Among the variety of reasons that can explain non-disclosure (such as agency costs or uncertainty about the information signal received), proprietary costs, i.e., the cost of revealing sensitive information that can be used by competitors to gain a strategic advantage, are the most compelling explanation for not observing full disclosure equilibria (Verrecchia, 2001). Indeed, managers and prior literature commonly propose proprietary costs as a reason for concealing segment information. Most empirical studies on segment reporting use a proxy for competition, such as industry concentration or the speed of profit adjustment over time, as a measure of the extent of proprietary costs firms face and assess whether there are systematic differences in disclosure behavior across competition levels. This approach has two major limitations. First, it is not obvious that higher industry concentration indicates lower levels of competition, nor is it clear whether greater competition leads to more or less disclosure. Theoretically, there can be fierce competition in highly concentrated industries (e.g., as Bertrand noted in 1883, there can be cut-throat price competition in duopolies), different types of competition (from potential entrants versus existing rivals) affect disclosure behavior differently (see e.g., Li, 2010), and the effect of competition on disclosure also depends on whether it concerns good or bad news (e.g., Verrecchia, 2001). Indeed, empirical research produces conflicting results: Harris (1998) and Botosan and Stanford (2005) find

that there is more segment disclosure in less concentrated industries, whereas Botosan and Harris (2000) find no evidence that increases in competition lead managers to start disclosing more segment information. Moreover, Ali et al. (2009) criticize the use of concentration measures as proxies for competition, as most studies calculate concentration using only public firms. They show that including private firms in the calculation can reverse the results obtained in prior literature. Dedman and Lennox (2009) also show that traditional competition measures are weakly or not correlated with managers' perception of competition, which casts further doubt on the validity of these proxies.

Second, Berger and Hann (2007) and Bens et al. (2011) argue that agency costs are a plausible alternative explanation to many of the results found in prior studies. For instance, Berger and Hann (2007) argue that non-disclosure can also be a result of managers not wanting to report detailed information about segments with poor performance to investors, particularly when agency cost considerations dominate. Both of these studies show strong support for the agency cost explanation of non-disclosure.

In this study, we address both of these issues explicitly. We introduce alternative measures of proprietary costs that do not depend on traditional measures of competition and also distinguish between both agency and proprietary cost explanations for segment disclosure. This is also the reason we look at geographic segment disclosures. With the exception of a few studies (e.g. Callen, Hope and Segal, 2006; Hope and Thomas, 2008), most segment reporting studies focus on business segments. By instead focusing on geographic segments, we can use the economic characteristics of the location of geographic segments to infer whether proprietary or agency costs dominate the decision to disclose. We argue that when agency cost considerations dominate, managers have incentives to disclose or "show off" segments in regions with higher current and expected GDP growth and higher GDP (our measures of economic growth and economic wealth). In contrast, when proprietary

costs are more important to a firm, we expect managers to hide segments in high growth or prosperous areas, i.e., areas that are likely to be most profitable to a firm. The intuition behind this approach is similar to that in Berger and Hann (2007), who distinguish between segments based on segment profitability, whereas we distinguish based on the inferred profitability of segments based on their location.

*H1: When agency costs dominate, firms are more likely to <u>disclose</u> segments with higher economic wealth or growth.*

*H2: When proprietary costs dominate, firms are more likely to <u>hide</u> segments with higher economic wealth or growth.*

Another location characteristic that is an intuitive measure of proprietary costs is the ease of starting a business in a particular country or region. There is substantial variation in the time, cost and effort to start a new business across countries (Djankov, La Porta, Lopez-de-Silanes and Shleifer, 2002). Intuitively, the proprietary costs of disclosing information about a certain geographic segment are likely lower when it is more difficult for competitors to act upon this information, i.e., when it is harder for them to start or do business in a particular region. In our setting, this means that we would observe more disclosure when entry barriers are high (ease of doing business is low). We therefore predict that:

*H3: When a segment's location has high entry barriers, firms are more likely to disclose this segment.*

In the next section, we explain how we determine which segments are hidden or disclosed and the importance of proprietary or agency costs.

## 3. Methodology

To test our hypotheses, it is necessary to determine two things: whether segments are hidden or disclosed and when agency and proprietary costs are important. We explain below how we test this, as well as how we determine GDP and GDP growth for each segment. Further details on variable measurement are provided in the Appendix.

### *3.1 Determining Hidden Segments*

With respect to the first issue, we use the switch from IAS 14 to IFRS 8 to assess which geographic segments managers wanted to keep hidden. IFRS 8 requires firms to report operating segments, which can be line-of-business, product line or geographic segments. Reported segments have to be consistent with how they are defined internally for decision making purposes. This approach, also called the "management approach", is intended to increase the usefulness of segment reports by allowing investors to view operations through the eyes of management. An initial concern that accompanied the introduction of IFRS 8 was that it may lead to a loss of geographic segment reporting. Under IAS 14, if a firm chose business segments as its "primary" segments, geographic segments were automatically designated as "secondary" segments. This meant a firm would have to report revenues, assets and capital expenditures for these secondary segments. In contrast, if a firm reports business segments as its operating segments under IFRS 8, there is no secondary reporting format for geographic segments. This caused concern that IFRS 8 would reduce the amount of geographic segment information available to investors and led to opposition to the introduction of this standard (Véron 2007). However, to counter this concern, IFRS 8 includes disclosure requirements for geographical areas and even disclosures by individual foreign country, which went further than IAS 14. Indeed, several prior papers show that IFRS

8 resulted in greater disaggregation of geographic segments (see e.g., Crawford et al., 2012; Nichols et al., 2012; Leung and Verriest, 2013) and thus forced disclosure of hidden geographic segments.

As IFRS 8 also requires firms to restate their segment disclosures for the year prior to adoption for comparison purposes, we can compare these restated disclosures to the original disclosures and infer which segments are newly disclosed and which are old. If we find that a segment in the restated segment footnote does not exist in the original pre-adoption year segment footnote, we view these as new or previously hidden segments. If a segment appears in both the original and restated segment footnote, we view these as old. We code a dummy variable *D(New Segment)* equal to 1 for newly disclosed segments and 0 otherwise. Under H1, we expect there to be a negative relationship between GDP (growth) and *D(New Segment),* whereas under H2 we expect this relationship to be positive. We run the following logistic regression model to test the hypotheses:

$$D\left(New\ Segment_{i,j}\right) = f(Segment\ Location\ Characteristic_i, Control\ Variables_j),$$

where i represents segment, j represents firm, and *Segment Location Characteristic* can be current GDP growth, expected GDP growth, current GDP per capita (H1 and H2) or a measure of the ease of starting a business (H3). We control for a number of factors that can influence whether a segment is hidden or not, such as firm size, profitability, growth opportunities and industry concentration and cluster standard errors at the firm-level.[3]

We obtain data on GDP growth and GDP per capita from the World Bank. We use the Doing Business database developed by the World Bank and International Finance

[3] We also include a dummy variable *D(Report Income)* that is equal to 1 when income is reported for that segment, since in a prior paper (Leung and Verriest, 2013), we find that firms seem to trade-off disclosing more disaggregated segments for reporting more items. We include this to control for firm-level disclosure incentives that are not picked up by the other control variables in the regression.

Corporation to obtain measures on the ease of starting a new business. This database measures the number of procedures, time and cost to comply with all procedures, and minimum capital required to start a new firm in 177 countries. These measures are constructed based on official legislation, surveys and interviews with experts.[4]

*3.2 Measures of the Importance of Agency or Proprietary Costs*

Next, we attempt to distinguish between conditions where agency costs considerations are more important and where proprietary cost considerations dominate. We rely on prior literature to make this distinction. Under the agency cost hypothesis, we expect managers to show off segments in more prosperous economic regions when firms are more closely followed by outside shareholders or analysts. We also expect that firms are more likely to disclose good performance when it is more costly to *not* show off, such as for firms that are performing poorly in terms of profitability or growth opportunities.

With respect to proprietary costs, we first distinguish between firms with and without R&D, as Ellis, Fee and Thomas (2012) show that proprietary costs of disclosure are greater for firms that engage in R&D. We also distinguish between firms with a low and high proportion of foreign sales; Tsakumis, Doupnik and Seese (2006) show that the proprietary costs of disclosing segment information are greater for firms that rely more on foreign activities.

To empirically test this, we run the regression model (1) for subsamples based on the magnitude of agency costs or proprietary costs. We split the sample at the median for most tests; e.g., the high (low) agency cost subsample has analyst following greater (smaller) than the median. For the subsamples based on profitability or R&D, we split at zero: firms in the low (high) profitability subsample make losses (profits), and (non-)R&D firms (do not) have

[4] Detailed description on the measurement of these variables is available at: http://www.doingbusiness.org/methodology/starting-a-business. We obtained the data from: http://www.doingbusiness.org/custom-query.

non-zero R&D expenditures. We test whether the coefficient on *Segment Location Characteristic* is significantly different in the expected direction across subsamples using a Wald-test. We prefer this approach to including interaction effects, since their interpretation is problematic in logistic regression (Ai and Norton, 2003).

## 4. Sample

We hand-collect segment reports for the years around the switch to IFRS 8 for the largest non-financial publicly listed firms in the following European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland and the UK. We are able to find geographic segment data in the annual reports for 1,711 stock-listed firms.

For our tests, we have to assign GDP and GDP growth to each segment. Since these data are provided at the country-level and not all geographic segments are reported at the country-level, we employ the following method. If a segment consists of a single separate country, we assign the corresponding GDP and GDP growth as reported by the World Bank in the year of disclosure. If firms aggregate two or more countries into a single segment and report the names of the aggregated countries, we assign the average GDP and GDP growth to those segments. If firms label a segment as a sub-continent or continent without reporting the specific countries, we assign the average across all countries in a sub-continent or continent. Since we cannot assign GDP or GDP growth to segments labeled "Other", "Rest of the World", "Headquarters" etc., we remove these from our sample. After matching this to the necessary data for the control variables in the regression analyses, our sample consists of 1,374 firms with 5,449 geographic segments, of which 1,351 are new segments. Table 1 provides details on sample selection and distribution across countries.

General descriptive statistics on this sample are provided in Table 2. We find that 25% of all geographic segments in our sample are newly disclosed, which is consistent with prior studies that show greater disaggregation under IFRS 8. We also find that there is considerable variation in the economic characteristics of segments. For instance, current GDP growth ranges from -8.23% to 9.22% while GDP per capita ranges from USD 7,077 to USD 76,542. The ease of doing business also varies greatly across segments: for some regions, only 2 procedures are necessary before starting a firm, while it can take up to 15 procedures for other regions.

## 5. Results

### *5.1 New Segments and Location Characteristics*

We first analyze whether there are systematic differences of firms with old versus new segments in Table 3 by comparing the means of firm and segment characteristics across the two subsamples. We find that firms with new segments are smaller on average, both in terms of assets and sales, but have higher market-to-book ratios, which is consistent with growth firms having more incentive to hide potentially proprietary information. We also find that firms with new segments have a higher proportion of foreign sales relative to total sales. This is consistent with Tsakumis et al. (2006), who find that firms reveal less geographic segment information for proprietary reasons when they depend more on foreign activities.

Turning to segment location characteristics, we fail to find a significant difference in the GDP growth of new versus old segments, although GDP per capita is higher for newly revealed segments, which is consistent with H2. We also find that it is much easier to start a new firm in the locations of newly revealed segments. For instance, on average it takes approximately 3 days less to start a business in the locations of hidden segments, and the cost

of complying with all procedures to start a business is approximately 8% lower in hidden segments. These results are consistent with H3.

Turning to the regression analyses, we first examine whether proprietary or agency cost considerations drive segment disclosure decision for the aggregate sample. In columns (1) and (2) of Table 4, we find that for the overall sample, current and expected GDP growth of a segment's location does not influence the decision to disclose or conceal this segment. However, we do find strong evidence that supports H2 and H3 in columns (3) to (6). Column (3) shows that new segments tend to be located in wealthier regions, suggesting that firms hide segments in areas with higher standards of living and thus are likely to be more profitable. We find that a one standard deviation increase in GDP per capita results in a 21% decrease in the likelihood of disclosure in absolute terms, which is an economically significant effect.

We also find that after controlling for other variables that could affect disclosure, entry barriers are still negatively related to *D(New Segment)*, which suggests that firms are more likely to disclose a segment when it is harder for other firms to enter that particular area. For instance, a one standard deviation increase in the number of procedures required to start a business is associated with a 1.88% higher likelihood of that segment being disclosed in absolute terms. The likelihood of reporting a segment is also increasing in the time it costs to start a business, and the cost of complying with all procedures, which is consistent with H3. A one standard deviation increase in the cost of complying with all procedures has the strongest impact on the likelihood of segment disclosure, namely 5.69% in absolute terms. These results strongly support the idea that proprietary costs are important determinant of geographic segment disclosure.

With regards to the control variables, we find that firms are less likely to hide segments when they are in more concentrated industries, which is consistent with Harris (1998) and

Botosan and Stanford (2005) who find that less competition is related to more disclosure. However, as we explain earlier, given the ambiguous interpretation of industry concentration as a measure of proprietary costs, we are cautious in interpreting this result.[5]

In sum, our findings confirm that proprietary costs are an important determinant of non-disclosure in general and that economic characteristics of a segment's location matter for disclosure. In the next section, we extend this analysis by considering the magnitude of proprietary and agency costs

*5.2 Variation in the Importance of Agency or Proprietary Costs*

We continue by investigating under which conditions firms are more likely to hide or show off certain segments. We first examine conditions that affect the impact of agency costs on disclosure. Under the agency cost hypothesis, we expect firms to show off if they are monitored more closely by outsiders. We use analyst following and concentration of shareholder ownership as proxies for this. With respect to shareholder ownership, we count the number of large shareholders (i.e., those with a 5% or higher stake in the firm) for each firm. We assume that as the number of large shareholders increases, there is less incentive to reveal information through segment disclosures, as private communication becomes easier. We also expect firms that perform poorly and thus have greater incentive to reveal activities in areas that are wealthier or have higher economic growth, to disclose such segments. Table 5 presents our findings. We run separate regressions for firms with a low or high number of block holders (Panel A), low or high analyst following (Panel B), with losses or profits (Panel C) and low or high market-to-book ratios (Panel D) and use a Wald-test to test for significant differences in the coefficients on the GDP variables. Panel A confirms that firms are significantly more likely to disclose segments with high GDP growth when there are fewer

[5] Note that we do measure concentration using both public and private firms. We use the Amadeus database to obtain sales data for private firms.

shareholders that hold a 5% or higher stake in the company, consistent with more outside scrutiny resulting in a higher likelihood of showing off. We find that a one standard deviation increase in current GDP growth leads to a 14.53% increase in the likelihood of segment disclosure, whereas there is no effect on disclosure when ownership is more concentrated. Similarly, Panel B shows that segments in high GDP growth areas are significantly more likely to be disclosed when analyst following is higher: the likelihood of disclosure increases with 18.70% with a standard deviation increase in current GDP growth. We do not find a significant difference between firms with losses and profits in Panel C, but Panel D shows that firms with low growth opportunities are more likely to show off segments in regions with higher economic growth. To the extent that firms with low market-to-book ratios represents markets undervaluing the firm, such firms have an incentive to disclose and emphasize segments located in areas that have high economic growth and are expected to grow rapidly in the near future to boost market valuation. Overall, the findings in Table 5 provide strong support for H1, namely that firms disclose "good" segments when agency costs of non-disclosure are greater.

Next, in Table 6 we examine factors that increase or decrease the magnitude of proprietary costs firms face. As mentioned, we expect firms to conceal information about segments that are vulnerable to exploitation by competitors, particularly when they engage in R&D (Panel A) or when they depend more on foreign sales (Panel B). For the GDP variables, we find some evidence that segments with high GDP growth are disclosed when firms do not engage in R&D, and hidden when a firm depends more on foreign sales, both consistent with the likelihood of disclosure varying with proprietary costs. We find that for both high and low proprietary cost conditions, high GDP segments are always less likely to be disclosed. We also find that the likelihood of disclosure increases when entry barriers are high, irrespective of whether proprietary costs are higher or lower according to our measures of these costs.

These results suggest that in general proprietary costs are important determinants of disclosure for all firms in our sample. This is consistent with the comment by Verrecchia (2001) that proprietary costs are the most compelling in explaining why non-disclosure exists.

In sum, our results show that both agency and proprietary cost considerations matter and that the likelihood of disclosure varies predictably with the magnitude of these costs.

## 6. Conclusion

In this paper, we investigate whether location characteristics of geographic segments can explain the likelihood of their disclosure. Theory suggests that a variety of costs determine (non-)disclosure of information, in particular proprietary and agency costs, although there are difficulties in accurately measuring these costs. We advance this literature by proposing measures of proprietary and agency costs that do not rely on typical competition measures that have been criticized in the literature. Instead, we examine the economic conditions of a segment's location, such as its economic growth, wealth, and ease of entry for a new firm. We predict that if agency costs dominate, firms are more likely to show off segments in regions with wealthier regions, and in regions with higher economic growth, whereas if proprietary costs are more important, such segments are more likely to be hidden. We also predict that if entry barriers are high, a segment will more likely be disclosed.

Our findings support these predictions. We find that segments in high economic growth areas are more likely to be disclosed, especially when shareholder ownership is less concentrated, when there is higher analyst following and when a firm has low growth opportunities. These findings are consistent with agency costs as a determinant of disclosure. We also find that segments in richer areas and low entry barrier segments are more likely to be hidden, consistent with the proprietary cost hypothesis. Our study contributes to the

literature on disclosure incentives and extends the literature on the measurement of proprietary costs and the effect of country-level factors on disclosure. Given the importance of these country-level factors, future research could look at whether other factors such as political stability, corruption or tax regulation decrease the likelihood of segments being disclosed.

**Appendix: Variables**

D(New Segment): Dummy variable equal to 1 if a geographic segment is only disclosed in the restated IFRS 8 segment report, 0 if a segment is disclosed in both the restated IFRS 8 and original IAS 14 segment report. (Source: hand-collected from IFRS 8 (pre-)adoption year annual report.)

D(Report Income): Dummy variable equal to 1 if an income measures is reported for a geographic segment, 0 otherwise. (Source: hand-collected from IFRS 8 (pre-)adoption year annual report.)

Assets (USD): Firm-level total assets in USD. (Source: Datastream.)

Log(Assets (USD)): Log of Assets (USD). (Source: Datastream.)

Sales (USD): Firm-level sales in USD. (Source: Datastream.)

Log(Sales (USD)): Log of Sales (USD). (Source: Datastream.)

Return on Sales: Firm-level net income divided by sales. (Source: Datastream.)

Herfindahl (SIC3): Sum of (firm sales/total industry sales)$^2$, measured using all public and private firms in the Amadeus database. (Source: Amadeus.)

D(Loss): Dummy variable equal to 1 if firm has negative earnings, 0 otherwise.

MTB: Market value of equity divided by book value of equity. (Source: Datastream.)

Analyst Following: Number of analysts following a firm. (Source: I/B/E/S.)

Foreign Sales %: Foreign sales divided by total sales. (Source: Datastream.)

***GDP measures***

Current GDP Growth (%): yearly GDP growth in year of IFRS 8 adoption for the location of a segment. If a segment consists of a single separate country, we assign the corresponding GDP and GDP growth as reported by the World Bank in the year of disclosure. If firms aggregate two or more countries into a single segment and report the names of the aggregated countries, we assign the average GDP and GDP growth to those segments. If firms label a segment as a sub-continent or continent without reporting the specific countries, we assign the average across all countries in a sub-continent or continent. (Source: World Bank.)

Expected GDP Growth (%): average expected yearly GDP growth for 5 years following IFRS 8 adoption for the location of a segment. See also Current GDP Growth (%). (Source: World Bank.)

GDP per capita (USD): GDP per capita in USD for the location of a segment. See also Current GDP Growth (%). (Source: World Bank).

***Entry Barrier measures*** *(see also:* http://www.doingbusiness.org/methodology/starting-a-business)

Start a Business – Number of Procedures: Start-up procedures required to start a limited liability company, including interactions to obtain necessary permits and licenses and to complete all inscriptions, verifications, and notifications to start operations. Data are for businesses with specific characteristics of ownership, size, and type of production (Source: Doing Business database.)

Start a Business – Time in Days: Median duration indicated by incorporation lawyers of completing all start-up procedures with minimum follow-up with government agencies and no extra payment. (Source: Doing Business database.)

Start a Business – Cost (% Income per Capita): All official fees and fees for legal or professional services required by law to start a business. Expressed as a percentage of the economy's income per capita. (Source: Doing Business database.)

Start a Business – Minimum Capital Required (% Income per Capita): Amount needed as a deposit in a bank or with a notary before registration and up to 3 months following incorporation. Expressed as a percentage of the economy's income per capita. (Source: Doing Business database.)

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**Table 1 Sample**

***Panel A: Sample Selection***

| Step | Number of firms | Number of segments |
|---|---|---|
| Largest public non-financial European firms (selected in Datastream) | 4,531 | |
| *Less: firms without segment footnote/restated segment data* | *- 2,820* | |
| Firms with segment data | 1,711 | 6,709 |
| *Less: firms without data for regression analyses* | | |
| - *Missing GDP/GDP growth* | *- 300* | *- 1,111* |
| - *Missing control variables* | *- 37* | *- 149* |
| **Sample** | **1,374** | **5,449** |

***Panel B: Sample Distribution across Countries***

| Country | Firms | Segments |
|---|---|---|
| Austria | 38 | 149 |
| Belgium | 37 | 151 |
| Czech Republic | 2 | 17 |
| Denmark | 37 | 139 |
| Finland | 64 | 307 |
| France | 119 | 472 |
| Germany | 172 | 590 |
| Greece | 37 | 109 |
| Ireland | 23 | 70 |
| Italy | 71 | 299 |
| Luxembourg | 12 | 49 |
| The Netherlands | 56 | 283 |
| Norway | 59 | 261 |
| Poland | 15 | 48 |
| Portugal | 14 | 60 |
| Spain | 40 | 165 |
| Sweden | 87 | 485 |
| Switzerland | 89 | 391 |
| United Kingdom | 402 | 1,404 |
| **Total** | **1,374** | **5,449** |

Table 1 details our sample selection process (Panel A) and presents the distribution of our firms and segments across countries (Panel B). All variables are defined in the Appendix.

**Table 2 Descriptive Statistics**

| Variable | Mean | Std Dev | P1 | P25 | P50 | P75 | P99 |
|---|---|---|---|---|---|---|---|
| D(New Segment) | 0.25 | 0.43 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| D(Report Income) | 0.27 | 0.44 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| Assets (USD) | 7,349,943.57 | 18,906,777.73 | 6,822.22 | 280,405.49 | 941,319.94 | 4,487,001.45 | 134,173,368.00 |
| Log(Assets (USD)) | 13.90 | 2.12 | 8.68 | 12.54 | 13.76 | 15.32 | 18.71 |
| Sales (USD) | 5,437,883.88 | 13,345,239.12 | 1,487.85 | 260,150.65 | 952,086.08 | 3,745,767.58 | 94,015,781.92 |
| Log(Sales (USD)) | 13.70 | 2.19 | 7.28 | 12.47 | 13.77 | 15.14 | 18.36 |
| Return on Sales | -0.06 | 0.55 | -4.47 | -0.01 | 0.03 | 0.08 | 0.35 |
| D(Loss) | 0.29 | 0.45 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| MTB | 2.09 | 2.03 | 0.00 | 0.92 | 1.50 | 2.55 | 13.51 |
| Analyst Following | 7.94 | 8.08 | 0.00 | 1.00 | 5.00 | 13.00 | 32.00 |
| Foreign Sales % | 66.51 | 26.87 | 0.00 | 52.38 | 70.75 | 87.86 | 100.00 |
| Herfindahl (SIC3) | 0.07 | 0.16 | 0.00 | 0.01 | 0.02 | 0.06 | 1.00 |
| Current GDP Growth (%) | 2.45 | 201.24 | -8.23 | -4.15 | -1.02 | 0.48 | 9.22 |
| Expected GDP Growth (%) | 7.26 | 201.20 | 0.19 | 1.98 | 4.07 | 4.31 | 9.56 |
| GDP per capita (USD) | 25,470.36 | 17,413.81 | 1,077.40 | 11,296.44 | 18,880.86 | 40,446.70 | 76,542.54 |
| Start a Business – Number of Procedures | 7.53 | 2.44 | 2.00 | 6.00 | 7.28 | 9.00 | 15.00 |
| Start a Business – Time in Days | 24.67 | 17.75 | 4.00 | 13.00 | 22.60 | 34.91 | 76.00 |
| Start a Business – Cost (% Income per Capita) | 28.96 | 35.24 | 0.00 | 2.10 | 18.80 | 45.18 | 136.28 |
| Start a Business – Minimum Capital Required (% Income per Capita) | 89.58 | 149.14 | 0.00 | 7.40 | 44.20 | 165.48 | 670.06 |

Table 2 presents descriptive statistics for the entire sample. *, ** and *** denote significance at the 10%, 5% and 1% level respectively. All variables are defined in the Appendix.

**Table 3 Old versus New Segments**

| Variable | Mean Old Segments | Mean New Segments | New-Old | T-statistic (equal variance) | T-statistic (unequal variance) |
|---|---|---|---|---|---|
| D(Report Income) | 0.30 | 0.18 | -0.12 | -8.71*** | -9.52*** |
| Assets (USD) | 7,822,343.73 | 5,917,008.08 | -1,905,335.65 | -3.22*** | -3.58*** |
| Log(Assets (USD)) | 13.94 | 13.77 | -0.17 | -2.53** | -2.62*** |
| Sales (USD) | 5,744,670.91 | 4,507,304.12 | -1,237,366.79 | -2.96*** | -3.25*** |
| Log(Sales (USD)) | 13.73 | 13.61 | -0.12 | -1.80* | -1.85* |
| Return on Sales | -0.06 | -0.05 | 0.01 | 0.42 | 0.43 |
| D(Loss) | 0.29 | 0.27 | -0.03 | -1.80* | -1.83* |
| MTB | 2.04 | 2.23 | 0.19 | 2.95*** | 3.01*** |
| Analyst Following | 8.01 | 7.75 | -0.26 | -1.03 | -1.04 |
| Foreign Sales % | 65.52 | 69.51 | 4.00 | 4.75*** | 4.5*** |
| Herfindahl (SIC3) | 0.08 | 0.06 | -0.02 | -3.52*** | -4.02*** |
| Current GDP Growth (%) | 1.27 | 6.06 | 4.79 | 0.76 | 0.59 |
| Expected GDP Growth (%) | 6.00 | 11.08 | 5.07 | 0.80 | 0.62 |
| GDP per capita (USD) | 24,514.00 | 28,371.26 | 3,857.26 | 7.09*** | 6.79*** |
| Start a Business – Number of Procedures | 7.59 | 7.34 | -0.25 | -3.23*** | -2.92*** |
| Start a Business – Time in Days | 25.32 | 22.71 | -2.60 | 4.68*** | 4.32*** |
| Start a Business – Cost (% Income per Capita) | 30.91 | 23.04 | -7.87 | -7.15*** | -6.77*** |
| Start a Business – Minimum Capital Required (% Income per Capita) | 92.22 | 81.58 | -10.64 | -2.28** | -2.12** |

Table 3 compares the mean of firm and segment characteristics across old and new segments. *, ** and *** denote significance at the 10%, 5% and 1% level respectively. All variables are defined in the Appendix.

**Table 4 Segment Disclosure and Location Characteristics**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Current GDP Growth (%) | 0.000112 | | | | | | |
| | (0.842) | | | | | | |
| Expected GDP Growth (%) | | 0.000117 | | | | | |
| | | (0.882) | | | | | |
| GDP per capita (in 1,000 USD) | | | 0.0119*** | | | | |
| | | | (5.192) | | | | |
| Starting a Business- N Procedures | | | | -0.0422*** | | | |
| | | | | (-2.673) | | | |
| Starting a Business - Time | | | | | -0.00917*** | | |
| | | | | | (-3.146) | | |
| Starting a Business – Cost | | | | | | -0.00891*** | |
| | | | | | | (-4.321) | |
| Starting a Business – Min. Capital | | | | | | | -0.000663 |
| | | | | | | | (-1.230) |
| D(Report Income) | -0.655*** | -0.655*** | -0.623*** | -0.651*** | -0.642*** | -0.627*** | -0.647*** |
| | (-4.724) | (-4.725) | (-4.492) | (-4.704) | (-4.641) | (-4.508) | (-4.673) |
| D(R&D) | 0.209 | 0.209 | 0.242* | 0.219* | 0.224* | 0.252* | 0.216* |
| | (1.611) | (1.610) | (1.864) | (1.687) | (1.737) | (1.942) | (1.655) |
| Return on Sales | 0.0598 | 0.0598 | 0.0680 | 0.0640 | 0.0671 | 0.0730 | 0.0624 |
| | (0.586) | (0.586) | (0.650) | (0.624) | (0.654) | (0.715) | (0.612) |
| MTB | 0.0421 | 0.0420 | 0.0428 | 0.0424 | 0.0428 | 0.0432 | 0.0423 |
| | (1.432) | (1.431) | (1.468) | (1.448) | (1.461) | (1.502) | (1.445) |
| Size | -0.0484 | -0.0484 | -0.0431 | -0.0456 | -0.0418 | -0.0426 | -0.0481 |
| | (-1.614) | (-1.614) | (-1.436) | (-1.517) | (-1.394) | (-1.424) | (-1.608) |
| Herfindahl | -0.784* | -0.784* | -0.739* | -0.771* | -0.767* | -0.745* | -0.774* |
| | (-1.955) | (-1.955) | (-1.868) | (-1.932) | (-1.936) | (-1.895) | (-1.942) |
| Intercept | -0.433 | -0.434 | -0.850* | -0.164 | -0.319 | -0.311 | -0.386 |
| | (-0.980) | (-0.982) | (-1.887) | (-0.368) | (-0.720) | (-0.706) | (-0.871) |
| N | 5,449 | 5,449 | 5,449 | 5,449 | 5,449 | 5,449 | 5,499 |
| Pseudo $R^2$ | 0.0203 | 0.0203 | 0.0273 | 0.0218 | 0.0236 | 0.0304 | 0.0211 |
| $\chi^2$ | 34.65*** | 34.72*** | 54.30*** | 42.01*** | 45.26*** | 48.01*** | 34.36*** |

Table 4 presents logistic regression analyses with D(New Segment) or D(Report Income) as the dependent variable. A negative coefficient indicates firms are more likely to disclose a segment that rates highly on the GDP measure, which is consistent with H1, whereas a positive coefficient indicates firms are more likely to hide a segment that rates highly on the GDP measures, which is consistent with H2. Z-statistics (in parentheses) are presented below the coefficients and are based on heteroscedasticity-robust standard errors clustered by firm. *, ** and *** denote significance at the 10%, 5% and 1% level respectively. All variables are defined in the Appendix.

**Table 5 Variation in Magnitude of Agency Costs**

***Panel A: Ownership Concentration***

| | N Blockholders ≤ 2 | N Blockholders > 2 | N Blockholders ≤ 2 | N Blockholders > 2 | N Blockholders ≤ 2 | N Blockholders > 2 |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | -0.0435*** | 0.000119 | | | | |
| | (-3.022) | (0.904) | | | | |
| Expected GDP Growth (%) | | | -0.0702** | 0.000121 | | |
| | | | (-2.244) | (0.914) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.0116*** | 0.0125*** |
| | | | | | (4.265) | (2.968) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 3,676 | 1,773 | 3,676 | 1,773 | 3,676 | 1,773 |
| Pseudo $R^2$ | 0.0248 | 0.0217 | 0.0235 | 0.0217 | 0.0280 | 0.0298 |
| $\chi^2$ | 35.54*** | 10.62 | 31.92*** | 10.64 | 39.72*** | 16.86** |
| Wald-test | 9.19*** | | 5.06** | | 0.03 | |

***Panel B: Analyst Following***

| | Analyst Following ≤5 | Analyst Following > 5 | Analyst Following ≤5 | Analyst Following > 5 | Analyst Following ≤5 | Analyst Following > 5 |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | 0.000105 | -0.0560*** | | | | |
| | (0.787) | (-3.179) | | | | |
| Expected GDP Growth (%) | | | 0.000107 | -0.107*** | | |
| | | | (0.803) | (-2.733) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.00874*** | 0.0153*** |
| | | | | | (2.861) | (4.321) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 2,805 | 2,644 | 2,805 | 2,644 | 2,805 | 2,644 |
| Pseudo $R^2$ | 0.0102 | 0.0426 | 0.0103 | 0.0418 | 0.0141 | 0.0483 |
| $\chi^2$ | 9.345 | 39.71*** | 9.373 | 38.56*** | 16.09** | 42.56*** |
| Wald-test | 10.15*** | | 7.49*** | | 1.98 | |

***Panel C: Profitability***

| | Loss Firms | Non-Loss Firms | Loss Firms | Non-Loss Firms | Loss Firms | Non-Loss Firms |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | -0.0227 | 0.000134 | | | | |
| | (-1.000) | (1.013) | | | | |
| Expected GDP Growth (%) | | | -0.00272 | 0.000138 | | |
| | | | (-0.0626) | (1.044) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.00955** | 0.0124*** |
| | | | | | (2.166) | (4.663) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 1,565 | 3,884 | 1,565 | 3,884 | 1,565 | 3,884 |
| Pseudo $R^2$ | 0.0113 | 0.0237 | 0.0104 | 0.0238 | 0.0149 | 0.0313 |
| $\chi^2$ | 6.991 | 30.97*** | 6.136 | 31.03*** | 10.13 | 47.88*** |
| Wald-test | 1.01 | | 0.00 | | 0.30 | |

***Panel D: Growth Opportunities***

| | MTB ≤ 1.50 | MTB > 1.50 | MTB ≤ 1.50 | MTB > 1.50 | MTB ≤ 1.50 | MTB > 1.50 |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | -0.0602*** | 0.000138 | | | | |
| | (-3.217) | (1.031) | | | | |
| Expected GDP Growth (%) | | | -0.0908** | 0.000139 | | |
| | | | (-2.376) | (1.043) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.0143*** | 0.00998*** |
| | | | | | (4.220) | (3.232) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 2,734 | 2,715 | 2,734 | 2,715 | 2,734 | 2,715 |
| Pseudo $R^2$ | 0.0266 | 0.0299 | 0.0241 | 0.0299 | 0.0305 | 0.0347 |
| $\chi^2$ | 28.74*** | 29.28*** | 23.24*** | 29.30*** | 33.13*** | 36.44*** |
| Wald-test | 10.4*** | | 5.67** | | 0.90 | |

Table 5 presents logistic regression analyses with D(New Segment) as the dependent variable, where we differentiate between firms that face high or low agency costs. A negative coefficient indicates firms are more likely to disclose a segment that rates highly on the GDP measure. We expect a larger negative coefficient when agency costs are high: i.e., when they have less concentrated ownership (Panel A), have high analyst following (Panel B), experience a loss (Panel C) or when they have low growth opportunities (Panel D). We conduct a Wald-test to test whether the coefficients in the high proprietary costs

condition are significantly greater. Z-statistics (in parentheses) are presented below the coefficients and are based on heteroscedasticity-robust standard errors clustered by firm. *, ** and *** denote significance at the 10%, 5% and 1% level respectively. All variables are defined in the Appendix.

**Table 6 Variation in Magnitude of Proprietary Costs**

***Panel A: R&D***

| | No R&D | R&D | No R&D | R&D | No R&D | R&D |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | -0.0299* | 9.67e-05 | | | | |
| | (-1.768) | (0.734) | | | | |
| Expected GDP Growth (%) | | | -0.0528 | 0.000100 | | |
| | | | (-1.439) | (0.762) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.00906** | 0.0147*** |
| | | | | | (2.507) | (4.955) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 2,542 | 2,907 | 2,542 | 2,907 | 2,542 | 2,907 |
| Pseudo $R^2$ | 0.0267 | 0.0151 | 0.0264 | 0.0151 | 0.0293 | 0.0257 |
| $\chi^2$ | 22.75 | 15.11 | 21.96 | 15.15 | 24.55 | 36.11 |
| Wald-test | 3.15* | | 2.08 | | 1.48 | |

***Panel A: R&D (Continued)***

| | No R&D | R&D | No R&D | R&D | No R&D | R&D | No R&D | R&D |
|---|---|---|---|---|---|---|---|---|
| Starting a Business | -0.0459* | -0.0410* | | | | | | |
| – N Procedures | (-1.921) | (-1.924) | | | | | | |
| Starting a Business | | | -0.0108** | -0.00826** | | | | |
| – Time | | | (-2.290) | (-2.177) | | | | |
| Starting a Business | | | | | -0.00836*** | -0.00957*** | | |
| – Cost | | | | | (-3.337) | (-3.144) | | |
| Starting a Business | | | | | | | -0.000140 | -0.00144** |
| – Min. Capital | | | | | | | (-0.347) | (-2.236) |
| Control Variables | YES | YES | YES | YES | YES | YES | YES | YES |
| N | 2,539 | 2,907 | 2,539 | 2,907 | 2,539 | 2,907 | 2,539 | 2,907 |
| Pseudo $R^2$ | 0.0273 | 0.0165 | 0.0298 | 0.0178 | 0.0342 | 0.0269 | 0.0254 | 0.0183 |
| $\chi^2$ | 24.72*** | 17.72*** | 24.42*** | 19.97*** | 27.02*** | 23.02*** | 20.80*** | 17.94** |
| Wald-test | 0.02 | | 0.17 | | 0.1 | | 2.92* | |

***Panel B: Foreign Sales %***

| | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 |
|---|---|---|---|---|---|---|
| Current GDP Growth (%) | -0.0298 | 0.000471*** | | | | |
| | (-1.591) | (4.437) | | | | |
| Expected GDP Growth (%) | | | -0.0619 | 0.000574*** | | |
| | | | (-1.637) | (5.304) | | |
| GDP per capita (in 1,000 USD) | | | | | 0.00992*** | 0.0133*** |
| | | | | | (2.889) | (4.324) |
| Control Variables | YES | YES | YES | YES | YES | YES |
| N | 2,645 | 2,804 | 2,645 | 2,804 | 2,645 | 2,804 |
| Pseudo $R^2$ | 0.0109 | 0.0346 | 0.0109 | 0.0346 | 0.0139 | 0.0429 |
| $\chi^2$ | 9.767 | 52.27*** | 9.845 | 61.23*** | 14.47** | 44.63*** |
| Wald-test | 2.61 | | 2.73* | | 0.53 | |

***Panel B: Foreign Sales % (Continued)***

| | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 | Foreign Sales % ≤ 69.59 | Foreign Sales % > 69.59 |
|---|---|---|---|---|---|---|---|---|
| Starting a Business – N Procedures | -0.0461* | -0.0353* | | | | | | |
| | (-1.856) | (-1.743) | | | | | | |
| Starting a Business – Time | | | -0.00893* | -0.00861** | | | | |
| | | | (-1.819) | (-2.421) | | | | |
| Starting a Business – Cost | | | | | -0.00261 | -0.0142*** | | |
| | | | | | (-0.948) | (-5.700) | | |
| Starting a Business – Min. Capital | | | | | | | 0.000361 | -0.00163 |
| | | | | | | | (0.745) | (-1.380) |
| Control Variables | YES | YES | YES | YES | YES | YES | YES | YES |
| N | 2,643 | 2,803 | 2,643 | 2,803 | 2,643 | 2,803 | 2,643 | 2,803 |
| Pseudo $R^2$ | 0.00766 | 0.0346 | 0.00875 | 0.0367 | 0.00692 | 0.0566 | 0.00609 | 0.0378 |
| $\chi^2$ | 7.821 | 35.53*** | 8.165 | 37.29*** | 6.021 | 48.17*** | 4.983 | 32.10*** |
| Wald-test | 0.11 | | 0.00 | | 9.76*** | | 2.43 | |

Table 6 presents logistic regression analyses with D(New Segment) as the dependent variable, where we differentiate between firms that face high or low proprietary costs. A positive (negative) coefficient indicates firms are more likely to hide (disclose) a segment that rates highly on the GDP (entry barrier) measure. We expect a larger positive (negative) coefficient on the GDP (entry barrier) measure when proprietary costs are high: i.e., when they engage in R&D (Panel A) or have a high proportion of foreign sales (Panel B). We conduct a Wald-test to test whether the coefficients in the high proprietary costs condition are significantly greater. Z-statistics (in parentheses) are presented below the coefficients and are based on heteroscedasticity-robust standard errors clustered by firm. *, ** and *** denote significance at the 10%, 5% and 1% level respectively. All variables are defined in the Appendix.