

Where do Investor Relations Matter the Most?

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Abstract:

We test the hypothesis that the marginal benefit of investment in investor relations (IR) is greater in countries where capital market institutions are generally less developed and tailored to a more concentrated ownership structure. We use a large panel of survey-based annual IR rankings of German and U.K. companies to study the marginal benefits of IR using within-firm variation. We find that IR quality in Germany exhibits a positive association with capital market visibility, liquidity, and firm value and a negative one with information asymmetry and uncertainty as well as cost of equity capital – and significantly more so than in the U.K. In a broader European sample, we find that the benefits of IR accrue more significantly to firms located in countries where i) corporate ownership is more concentrated and ii) capital market institutions are weaker. Overall, the evidence suggests that IR provides greater marginal benefits in markets where demand for this type of shareholder communication has been historically lower.

Keywords: Investor Relations; Transparency; Ownership Concentration; Firm Visibility; Information Asymmetry; Cost of Capital

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1. Introduction

In increasingly globalized capital markets, public companies must communicate effectively with a broadening set of investors and information intermediaries. That communication entails the timely dissemination of mandated and voluntary disclosures, the facilitation of access to management during conference calls, non-deal roadshows, or other private meetings, etc. All these tasks typically fall under the purview of the investor relations (IR) function.¹ Yet, our understanding of IR's contribution to capital allocation and firm value remains limited. Indeed, because of the multifaceted nature of IR, lack of data availability has limited archival research on the topic. Furthermore, while the literature has examined the emergence of global norms in terms of financial reporting and corporate disclosure, the evidence thus far on more broadly defined IR is based on single-country studies, mostly using U.S. data. Hence, whether the effectiveness and value of firms' IR varies across jurisdictions remains largely unaddressed.

In this paper, we build on the existing literature by innovating along two dimensions. First, we use a novel dataset of survey-based rankings of quoted companies by country-year to measure the effectiveness of IR in a large panel. Second, our dataset includes firms from several European countries, which enables us to examine cross-country variation in the effectiveness of IR. While Western European capital markets have converged in terms of capital market institutions, e.g., through the EU-wide adoption of IFRS and the Market Abuse Directive, significant differences remain across countries along capital market institutions and corporate ownership. The main research question we address is whether IR has a greater incremental effect on firms' information environment and ultimately firm value in insider-oriented markets versus more outsider-oriented ones.

We first examine this question by contrasting two of the largest markets in Europe, i.e., Germany as a prime example of a bank/insider based financial system versus the U.K. as a prime example of a market/outsider based financial system. Our main hypothesis speaks to the relative effect of IR in a

¹ The U.K. IR Society defines investor relations as “the communication and insight between a company and the investment community. This process enables a full appreciation of the company's business activities, strategy and prospects and allows the market to make an informed judgment about the fair value and appropriate ownership of a company” (from IR Society website: <http://irsociety.org.uk/about>).

fundamentally different capital market environment. We expect firms to be able to better differentiate themselves in a historically less shareholder-oriented market like Germany (Tirole 2001).² The German market exhibits higher ownership concentration in conjunction with lower transparency and weaker minority investor protection relative to Anglo-Saxon markets (Leuz et al. 2003; La Porta et al. 1999 and 2006; Djankov et al. 2008). This setting can leave opportunities for firms to signal their commitment to higher standards in terms of communication with investors. Accordingly, we expect German firms that are perceived as more effective in IR than their local peers to enjoy greater capital market benefits than their U.K. counterparts do. That said, there is tension in this hypothesis. First, if ownership remains more concentrated in the hands of domestic shareholders, demand for IR may be limited among some German firms. IR's primary target audience consists of sell-side analysts and institutional investors with minority stakes. Furthermore, in Germany information dissemination and price formation may (historically) be less sensitive to IR efforts. Second, in the backdrop of convergence efforts in financial reporting standards and securities regulation in the E.U., the larger German firms may have already caught up with global best practice in IR (IR Magazine 2003). Accordingly, whether firms' investments in IR yield larger benefits in Germany (or rather in the U.K.) is an open empirical question.

To answer this question, we obtain annual survey-based within-country rankings of German and U.K. quoted companies based on the perceived quality of their investor relations.³ The surveys are run by Extel, and respondents include more than 12,000 buy-side and sell-side firms. The sample covers 338 U.K. and 198 German firms over the period 2006-2014, which account for 1,636 (1,134) U.K. (German) firm-years. Our main analysis consists of panel regressions of capital market variables on IR rankings and control

² The historically lower level of shareholder orientation in Germany relative to the U.K. is exemplified by the fact that the U.K. IR society was formed in 1980, whereas the German equivalent (DIRK) was only founded in 1994.

³ Throughout the paper, we assume that firms that are more highly ranked by outsiders invest relatively more than their peers in IR. To validate this assumption, we obtain data on IR staff size, budget and remuneration for the larger firms in our sample. For German firms, we find a positive and significant association between IR rankings and (i) the number of IR employees in the firm and (ii) the total remuneration of IR employees, while results for the U.K. are mixed. This finding suggests that firms that invest more in IR, particularly in IR-related human capital, are better ranked. The evidence corroborates our interpretation of the main results. That is, while greater investment in IR staff and remuneration can significantly improve IR rankings in Germany, the U.K. market is more mature and competitive, and therefore those investments do not offer the same marginal returns in the U.K.

variables, with firm fixed effects, consistent with Chapman et al. (2018). The inclusion of firm fixed effects ensures that our results do not merely reflect unobservable time-invariant firm (or industry or country) characteristics that are associated with investors' perception of IR quality. We also control for a variety of time-varying firm characteristics that are expected to be correlated with both IR and capital market outcomes.⁴ We analyze Germany and the U.K. as separate samples and then pool the two populations of firms while interacting IR rankings with an indicator for German firms to address the question whether the marginal benefits of IR investments are larger in Germany.

First, we look at analyst following and institutional ownership, because one of IR's fundamental goals is to enhance firm visibility and attract more institutional ownership (Bushee and Miller 2012). Consistent with that view, we find a positive association between German firms' IR rankings and both analyst following and institutional ownership. Although the statistical significance is marginal for institutional ownership, we find that better-ranked German firms are significantly more likely to attract analysts and institutional investors relative to better-ranked U.K. firms. German firms are also more likely to attract foreign investors, suggesting that their IR efforts pay off beyond the domestic capital markets.

Next, we examine the effect of IR on the information environment using analyst forecasts (Chapman et al. 2018). We find a significantly negative association between IR rankings and both analyst forecast dispersion and errors. Furthermore, the incremental association between IR ranking and forecast dispersion and error is significant for German firms relative to U.K. firms. This evidence suggests that IR pays off by reducing information uncertainty to a greater extent in the German market. Consistent with the analyst-based measures, we also find that German firms that are better ranked in IR enjoy significantly lower stock return volatility and illiquidity, as measured according to Amihud (2002). Furthermore, the effect for illiquidity is significantly stronger than for U.K. firms.

Lastly, we test whether the benefits in terms of visibility and information environment extend to valuation improvements (Bushee and Miller 2012). We find that German firms with better IR rankings have

⁴ In additional tests, we perform the entropy balancing technique to "match" the German and U.K. firms. We obtain qualitatively similar results under this specification.

significantly higher Tobin's Q and significantly lower cost of equity, estimated according to Claus and Thomas (2000). A one-standard deviation increase in IR ranking is associated with a Tobin's Q increase of 0.126 for German firms. Given that the standard deviation of Q in the full sample is 0.96, the effects are economically meaningful. Furthermore, we find a positive and significant incremental effect for German firms in the pooled sample, suggesting that the marginal benefit of better IR is greater for German firms. The lower cost of capital is also incrementally significant when benchmarked against U.K. firms.

Collectively, the results indicate that German firms with higher IR rankings enjoy higher capital market visibility, lower information asymmetry and uncertainty, higher valuation and lower cost of equity capital. The finding that those capital market benefits significantly exceed those experienced in the U.K. is consistent with greater marginal benefits to IR in a market that traditionally has less of an outside investor orientation – i.e., Germany – relative to a market with more diffuse ownership such as the U.K.

One limitation of our main sample is that we use data from only two countries. It is possible that the results are specific to Germany and the U.K., and, if not, it is at least impossible to tell apart which country characteristics drive the results. To shed light on this issue, we take advantage of another sample with broader cross-sectional variation from thirteen European countries. We run the same pooled regressions as in the main sample except that we replace firm- with country- and industry-fixed effects. This is because we only have at most three years of data for this sample.⁵ Furthermore, instead of interacting IR rankings with an indicator for German firms, we examine country characteristics that are representative of the main differences between Germany and the U.K. Specifically, we follow Isidro et al. (2016) and test whether country-level financial reporting quality is associated with the degree to which IR translates into capital market benefits. Importantly, we also examine the impact of corporate ownership concentration. Our results indicate that, on average, the capital market benefits associated with better IR rankings accrue more significantly to firms in countries with relatively lower financial reporting quality as well as more concentrated ownership. Hence, the cross-sectional results are consistent with our interpretation of the main

⁵ Due to a change in ownership of the data vendor, we could not obtain more time series for this dataset.

results using German and U.K. firms. Further analysis indicates that the second, third and fourth country-level factors identified by Isidro et al. (2016) are each associated with lower marginal benefits to IR. These results further highlight the multi-dimensional nature of the country-level differences that determine the extent to which firms reap capital market benefits from their IR efforts.

Our paper contributes to the literature on investor relations. While prior research focuses primarily on U.S. firms (Bushee and Miller 2012; Kirk and Vincent 2014; Chapman et al. 2018), we offer new insights by comparing the capital market effects of IR in a cross-country setting. By documenting that the marginal benefits of IR are significantly greater in Germany than in the U.K., we show that firms' IR efforts can pay off in a market where it is still a relatively newer practice. Furthermore, since our main sample consists of the largest quoted German and U.K. firms, it complements Bushee and Miller (2012), who focus on small- and mid-cap U.S. firms. If large German companies benefit from IR, it likely is in part for different reasons than small U.S. firms, including but not limited to communicating with foreign investors.

Our paper also contributes to the literature on disclosure in an international setting. IR is a multidimensional function, of which disclosure is only a subset (Brown et al. 2018). Recent research highlights non-U.S. firms' efforts to communicate with U.S. investors through written disclosure (Lundholm et al. 2014) and the challenges those firms face when holding conference calls in English (Brochet et al. 2016). Our paper is consistent with the notion that firms in a non-English-speaking country can benefit from investing in IR. However, the angle from which we approach the question differs from the cross-country comparison that most studies undertake. That is, we examine within-country variation in IR, and compare its marginal benefit across countries.⁶

Lastly, we note that two concurrent papers by Karolyi and Liao (2017) and Reiter (2017) also examine IR in a cross-country setting. Reiter (2017) focuses primarily on U.S. cross-listed firms and finds that those firms enjoy a valuation premium if they actively communicate with U.S. investors. Our results complement Reiter's because we focus on non-U.S. firms' domestic markets (while controlling for cross-

⁶ In untabulated tests, we find that Pan-European rankings have no significant association with capital market outcomes. This finding further validates our assumption that IR differentiation occurs primarily at the domestic level.

listing). The main finding in Karolyi and Liao (2017) is that better IR is associated with higher Tobin's Q, and this result is driven by firms that are not cross-listed in the U.S. and those domiciled in countries with weaker shareholder protection and less disclosure. Our cross-country results are consistent with theirs. However, as we elaborate in the next section, their sample consists of a single year of self-reported survey data from corporate IR officers around the world. Accordingly, our panel allows for significantly more powerful statistical tests, and complements their data, which contains a wealth of insightful descriptive information on IR practice.

The rest of the paper is organized as follows. Section 2 reviews the institutional background and literature, and develops the hypothesis. Section 3 describes the data and research design. Section 4 reports the empirical results. Section 5 concludes.

2. Institutional Background, Literature, and Hypothesis

IR is a multi-disciplinary function that is increasingly central to how public firms communicate with investors. IR has made its way onto the organizational chart of many public companies, especially among the largest ones (Chapman et al. 2018). The emergence of IR maps into a broader trend of globalization of capital markets. IR developed first in Anglo-Saxon markets, especially the U.S. The first attempt at formalizing corporate relations with shareholders traces back to 1953, when General Electric Chairman Ralph Cordiner created an in-house IR department. Subsequently, U.S. IR practitioners formed a professional association to advance the development of their discipline and share best practice. The National Investor Relations Institute (NIRI) was founded in 1969. For a while, IR remained a primarily Anglo-Saxon concept, consistent with the greater development of equity markets in the U.S. and U.K. (Marston 2004).⁷ The U.K. IR Society was founded in 1980, whereas the German one (DIRK) was founded no earlier than 1994. This development reflects, to a significant extent, the demographics of institutional

⁷ Kay Bommer, managing director of the German IR association DIRK, is quoted by IR Magazine as saying "The US was doing IR decades before we knew it would make sense to talk to investors" (IR Magazine 2013).

investors, which are predominantly from North America and the U.K. (Aggarwal et al. 2011) and are the primary consumers of IR.

It follows, then, that the vast majority of the academic literature on IR is based on U.S. firms. The baseline finding in the literature is that IR has capital market benefits. That is, firms that invest more in IR enjoy higher valuations and lower information asymmetry. Bushee and Miller (2012) document those benefits among small and mid-caps, where IR investment is proxied by the hiring of an IR consultant. In contrast, Kirk and Vincent (2014) use a different proxy - IR professionalization, which they measure by identifying IROs who are members of NIRI. Earlier work by Lang and Lundholm (1996) also indicates that analysts' ratings of firms' IR are positively associated with analyst following and the quality of analyst forecasts. Differences in measurement and sample periods aside, the evidence is quite consistent in supporting the notion that IR has capital market benefits.⁸

Evidence outside of the U.S. is sparse. Karolyi and Liao (2017) use an IR index based on survey responses from IR officers (IROs) of international firms to estimate IR quality. Consistent with the U.S. evidence, they find a positive association between IR quality and Tobin's Q as well as foreign analyst coverage, foreign institutional ownership, global equity issuance, and cost of capital. They further find that the results for Tobin's Q are driven by firms that are not cross-listed on U.S. exchanges and those domiciled in countries with weaker shareholder protection and less corporate disclosure. While our paper overlaps with Karolyi and Liao (2017), significant differences remain. Their data consists of answers from IROs to the BNY Mellon 2012 Global Trends in Investor Relations Survey. With 773 responses from across 59 countries, mainly from the Americas and Asia Pacific, Karolyi and Liao (2017) have a significant cross-section of data. Their detailed questionnaire allows for granular descriptive data on several IR facets, similar to Brown et al. (2018). However, Karolyi and Liao (2017) lack time-series variation. Our dataset significantly differs from theirs and allows us to better address our research question. Indeed, our coverage

⁸ Bushee and Miller (2012) examine a sample of small and mid-cap firms that hire an external IR firm between 1998 and 2004. Kirk and Vincent (2014) identify firms with professional IR officers by looking at the membership directory of NIRI, for the 1983-2009 period. Lang and Lundholm (1996) use ratings from the Financial Analysts Federation Corporate Information Committee from 1982 to 1988 and 1985 to 1989, respectively.

includes much greater within-country variation and within-firm variation, with 332 U.K. and 198 German firms, covered over a nine-year period. This data enables us to make use of changes over time within firms and countries and, thus, to control for firm fixed effects in order to examine the marginal benefit of IR per firm and country. Furthermore, Karolyi and Liao (2017) have to rely on self-reported measures of IR that come from IROs working for very large internationally operating corporations, whose IR needs are unlikely to be representative of the average firm. In contrast, we use an IR quality measure based on an international survey among more than 12,000 buy-side and sell-side firms, which is available for numerous German and U.K. firms of different size that account for the bulk of their countries' market capitalizations.

There is a far more developed literature on cross-country variation in financial reporting and information asymmetry (see Leuz and Wysocki 2016 for a review). Of particular relevance to us is the contrast between 'shareholder' and 'stakeholder' governance models that correspond to common and code law regimes, respectively (e.g., Tirole 2001; Denis and McConnell 2003). Specifically, German and U.K. firms significantly differ in terms of ownership structure, as ownership is much more diffuse in the U.K., whereas German firms are significantly more likely to have controlling shareholders (e.g., La Porta et al. 1999; Goergen and Renneboog 2003). Partial controlling stakes by large shareholders, such as families, and bank/creditor monitoring are more descriptive of the German system, where corporate governance, while compliant with E.U. rules, still reflects the heritage of the German codes and legal doctrine (Goergen et al. 2008). These differences are also reflected in relatively lower levels of disclosure and investor protection in Germany relative to the U.K. (Leuz et al. 2003; La Porta et al. 2006; Spamann 2010).

Our main interest is in testing whether the broader capital market environment shapes the extent to which IR can yield benefits to the firm in terms of greater valuation. We expect Anglo-Saxon markets to be more mature, as evidenced by the longer history of IR in the U.S. and U.K. relative to continental European markets, and the generally more shareholder-oriented model of ownership and reporting adopted and disseminated by Anglo-Saxon investors (e.g., Yu and Wahid 2014, Fang et al. 2015). As a result, we posit that the IR market is more competitive in the U.K. relative to Germany, meaning that the marginal benefits to better IR should be smaller in the former. The idea is that if firms operate in markets where IR

is not taken for granted and voluntary disclosure (using plain English) or one-on-one meetings are less common as ownership is more concentrated, then firms that invest in IR can stand out more clearly. Indeed, IR primarily targets large institutional investors with minority stakes and sell-side analysts as conduit to further reach out to those investors. This can result in increased demand for the firm's shares, especially from foreign and institutional investors, which would be consistent with the findings of Karolyi and Liao (2017).⁹

However, there are reasons to expect why we could fail to reject the null or find opposite results. First, in more recent years, German firms have been perceived as having highly competitive IR. Among the Top 100 Best Companies for IR in the most recent Pan-European Extel survey, five of the first ten were German, including the top 2 (Deutsche Telekom and Munich Re). Consistently, about one in four of the Top 100 European firms is German. To the extent this trend reflects a pervasive development of best practice among the larger German firms, it could mean that the German market has already reached the level of competitiveness of the U.K., at least among companies in the major stock index DAX. In the broader context of corporate transparency, the adoption of IFRS has coincided with convergence efforts both at the regulatory level (e.g., with the E.U. Market Abuse Directive) and firm level (e.g., in terms of voluntary disclosure – see Li and Yang 2016). As a result, German capital markets behave more like the U.K. than they did at the beginning of the century. Second, it is possible that German IR could face structural constraints in achieving the levels of capital market benefits that have been documented in the U.S. This could happen if the demand for IR remains lower in Germany, e.g., due to the larger number of blockholders who may obtain information through other channels, or if effective IR requires a capital market environment that is more aligned with that of the U.S. or U.K. Altogether, because of this tension, we formulate our summary hypothesis in its null form, and break it down by capital market outcome:

⁹ In some sense, it is also similar in spirit to Bushee and Miller (2012), who argue that IR should yield greater benefits in smaller firms. However, by focusing on the largest U.K. and German firms, we set aside the firm size component of IR to examine the country-level determinants thereof.

H1: The marginal benefits of better investor relations in terms of capital market outcomes are the same in the U.K. and Germany:

H1a: Better IR rankings are associated with higher visibility (measured by analyst coverage and institutional ownership) to the same extent in the U.K. and Germany;

H1b: Better IR rankings are associated with lower analyst-based information asymmetry and uncertainty (measured by analyst forecast error and dispersion) to the same extent in the U.K. and Germany;

H1c: Better IR rankings are associated with lower market-based information asymmetry and uncertainty (measured by stock illiquidity and return volatility) to the same extent in the U.K. and Germany;

H1d: Better IR rankings are associated with higher firm valuation and lower cost of equity capital to the same extent in the U.K. and Germany.

3. Data and Research Design

3.1 Sample and IR variable

Our sample consists of all German and U.K. firms for which we obtain data on IR rankings from Extel WeConvene (formerly Extel).¹⁰ The sample covers German firms listed on Germany's largest stock indexes DAX, MDAX, SDAX, and TecDAX and U.K. firms listed on the FTSE100, FTSE250, and the FTSE Small Cap index. IR rankings are available for the fiscal years 2006 to 2014. The sample consists of 2,770 firm-years, of which 198 German firms account for 1,134 firm-years and 332 U.K. firms account for 1,636 firm-years. We retrieve accounting and stock price data for all firms from Thomson Reuters Worldscope and Datastream, respectively.

¹⁰ Thomson Reuters sold Extel to WeConvene in 2014. London-based Extel has conducted surveys among investment professionals since 1974. For more information, see <https://www.extelsurveys.com/about/>.

Our main variable of interest, *IR ranking*, is a measure of investor relations quality based on surveys among buy-side and sell-side firms conducted annually by Extel WeConvene. Each year, Extel conducts the survey between February and May. More than 12,000 international investment professionals participated in the survey in 2015. Participants assess several aspects of a firm’s quality of investor relations (on a 1-5 scale) for the last twelve months as of the survey date. They assess the overall quality of service, the website and webcasting, annual reports and formal disclosure, the business knowledge of the IR team, non-deal roadshows, one-on-one meetings, and the proactivity of senior executives. Votes from buy-side firms are weighted using European equity assets under management. Votes from sell-side firms are weighted using brokerage ratings from the previous year. Extel WeConvene ranks the relative IR quality of all firms in a stock index. The IR rankings we use are based on surveys conducted between 2007 and 2015, which refer to the years 2006 to 2014.

Because the IR rankings provided by Extel WeConvene assign lower values to better IR quality, we multiply them by -1 to facilitate interpretation. That means higher values of the variable *IR ranking* correspond to better IR quality. We also standardize *IR ranking* to have a mean of 0 and a standard deviation of 1, such that its regression coefficients can be interpreted as the effect of a one-standard-deviation change in the quality of investor relations.

3.2. Research Design

To assess whether IR quality matters and where it matters most, we examine a set of corporate outcome variables using the following OLS regression models:

$$\text{Capital Market Outcome} = \beta_1 * \text{IR Ranking} + \sum_j \beta_j * \text{Control}_j + \text{Fixed Effects} \quad (1)$$

$$\begin{aligned} \text{Capital Market Outcome} = & \beta_1 * \text{IR Ranking} + \beta_2 * \text{Germany} + \beta_3 * \text{IR Ranking} * \text{Germany} \\ & + \sum_k \beta_k * \text{Control}_k + \text{Fixed Effects} \end{aligned} \quad (2)$$

We begin by describing the different dependent variables, all of which are winsorized at the 1st and 99th percentiles. Following Bushee and Miller (2012), we first consider the effect of IR quality on firm

visibility. Firms engage in investor relations to attract investors. As information intermediaries, sell-side analysts can be a conduit between IR officers and investors. Hence, it is also important for firms to achieve visibility through greater analyst coverage. In our empirical tests, *Analyst following* is the natural logarithm of the number of analysts that provide (fiscal year) EPS forecasts for a firm. We also examine institutional ownership measured by the percentage of shares outstanding held by the top 100 institutional holders of the firm's shares. Similarly, we examine the percentage of shares held by the top 100 foreign investors to test if better-ranked firms expand their investor clientele with non-domestic shareholders.

Following Chapman et al. (2018), we next examine analyst forecasts. Besides visibility, IR's other goal is to ensure that the investment community understands the company's strategy. Analysts are an important channel through which the market forms expectations for future cash flows. IR officers routinely engage with analysts to ensure that their forecasts are not too far off management's own expectations, subject to applicable rules on private communication (NIRI 2014). Hence, effective IR is associated with lower analyst forecast errors and dispersion (Chapman et al. 2018). In our tests, forecast error is the absolute difference between the actual EPS for the fiscal year and the mean analyst consensus for EPS forecast for the fiscal year divided by the stock price. Forecast dispersion is the natural logarithm of the standard deviation of analyst EPS forecasts for the fiscal year deflated by the stock price.

We then test whether IR's effectiveness in reducing information asymmetry and uncertainty among analysts materializes in market-based measures. Following Chapman et al. (2018) and Reiter (2017), we examine stock price volatility and liquidity. Reducing stock volatility is among IR's main goals (Graham et al. 2005; Billings et al. 2015). We define stock volatility as the standard deviation of daily stock returns, measured over the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year (Bushee and Noe 2000). As a proxy for liquidity, we use the illiquidity measure from Amihud (2002), which we also calculate for the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year.

Finally, we test whether IR pays off in terms of firm value (Bushee and Miller 2012; Reiter 2017), which we measure by Tobin's Q. We posit that the effect of IR quality on firm value, if any, is most likely to come through a denominator effect, i.e., through the cost of equity capital, our other valuation-related variable of inquiry. Theory shows that information asymmetry affects the cost of capital in imperfect markets (Armstrong et al. 2011). Prior empirical evidence also links illiquidity to cost of capital (e.g., Brennan and Subramanyam 1996). Insofar as firms seek and manage to lower information asymmetry and illiquidity through their IR efforts, we would expect a negative association between IR and cost of capital. We use the methodology described in Claus and Thomas (2001), who employ a residual income model based on EPS estimates, to determine a firm's cost of equity capital. We also calculate the cost of capital over the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year, consistent with Botosan and Plumlee (2002).

Consistent with prior research, we expect IR rankings to be (i) positively associated with analyst following and institutional (and foreign) ownership, (ii) negatively associated with analyst forecast error and dispersion, (iii) negatively associated with volatility and illiquidity, (iv) positively associated with firm value and negatively associated with cost of equity capital. This expectation should hold in Models (1) and (2). What differentiates Models (1) and (2) is that we run Model (1) by country, whereas we pool observations for Germany and the U.K. when using Model (2). Accordingly, Model (2) augments Model (1) with an indicator for German firms and an interaction term between *IR Ranking* and the German firm indicator (i.e., $IR\ Ranking * Germany$). To test our hypotheses, we examine the coefficient on that interaction term (β_3). β_3 measures the incremental marginal benefit of IR for German firms relative to U.K. ones. If IR differentiation pays off more in Germany, e.g., in terms of firm visibility and valuation, we would expect a positive β_3 when analyst following or institutional ownership and Tobin's Q is the dependent variable.

Throughout all our analyses, we use a set of control variables, which may affect both a firm's IR ranking and the aforementioned outcome variables. Specifically, we control for a firm's age (i.e., years

since the firm's IPO), its fraction of intangible to total assets, investments (i.e., capital expenditures and R&D expenditures relative to total assets), leverage (i.e., total debt to common equity in terms of book values), profitability and performance (i.e., ROE and annual buy-and-hold stock return), and size (i.e., the natural logarithm of the book value total assets). Firms' IPO dates are collected from Hoppenstedt Aktienfuehrer for German firms and from the website of the London Stock exchange as well as corporate websites for U.K. firms. To account for differences in voluntary disclosure quality, we also control for a firm's annual number of guidance announcements (as reported in Capital IQ). We expect guidance issuance to be associated with lower cost of equity capital (Cao et al. 2017) and stock volatility (Billings et al. 2015) as well as greater analyst following, lower forecast error and dispersion (Lang and Lundholm 1996). We further include an indicator variable that equals one for firms with a U.S. cross-listing at one of the major U.S. stock exchanges NYSE, AMEX and NASDAQ, as cross-listed firms may expand greater IR effort in their outreach to U.S. investors (Reiter 2017). Data on cross-listings for German firms is obtained from Hoppenstedt Aktienfuehrer. Data for U.K. firms is either from the Thomson Reuters Eikon database or hand-collected from annual reports. We also account for differences in corporate ownership concentration by controlling for the ownership stake of a firm's largest investor, measured as the percent of shares outstanding held by that investor. We obtain ownership data from the Thomson Reuters Eikon database. Ownership is measured at the first tier and refers to the end of the first quarter of each year. Appendix A provides an overview of the main variables used in our study, including detailed variable definitions.

As we have a panel of nine years of data, all regressions include year fixed effects to account for unobserved heterogeneity, which is constant across firms. Our regressions include firm fixed effects to account for unobserved time-invariant firm-specific heterogeneity. An advantage of firm fixed effects is that parameter identification comes from changes in IR quality over time with respect to the same firm. This approach allows us to examine the marginal benefits of IR while mitigating endogeneity concerns with respect to potential time-invariant firm (as well as country and industry) characteristics that might affect both IR quality and our outcome variables. One such example is the higher fraction of family firms across

large firms in Germany (see, e.g., La Porta et al. 1999). As family firms almost never change their status, firm fixed effects take this unobserved heterogeneity into account. Finally, we additionally include stock index fixed effects (for the DAX, MDAX, SDAX, TecDAX, FTSE100, FTSE250, and the FTSE Small Cap index), which in conjunction with firm fixed effects account for the potential impact of the inclusion or exclusion of firms in or from a specific stock index on IR rankings and outcome variables.

4. Empirical Results

4.1. Summary statistics

We present summary statistics for our sample in Table 1. Panel A reports summary statistics for the full sample comprising all German and U.K. firms. Panel B reports summary statistics separately for German and U.K. firms. For ease of interpretation and because the comparison of the two sub-samples is most relevant for our study, we focus on the statistics shown in Panel B. As indicated by the t-test for sample mean differences shown in the last column of Panel B, German and U.K. firms differ significantly along all variables except for *Amihud illiquidity*, *Capex/TA*, *Cost of equity capital*, and *Firm size*.

In terms of the outcome variables we analyze, German firms have a lower Tobin's Q (1.61 vs. 1.78), a higher stock volatility (0.024 vs. 0.021), are followed by more analysts (17 vs. 15), have a lower analyst forecast dispersion (-4.88 vs. -5.34) and a higher forecast error (0.038 vs. 0.016), have a slightly higher fraction of foreign ownership (0.281 vs. 0.265), and a considerably lower fraction of institutional ownership (0.308 vs. 0.638). With regards to accounting data, German firms have fewer intangible assets (18.6% vs. 23.4%), a higher leverage ratio (1.21 vs. 0.94), higher R&D expenses (2.5% vs. 1.5% of total assets), and a lower return on equity (10.9% vs. 26.7%).

Importantly, the numbers in Panel B point to significant differences between the German and the U.K. system. The average percentage of shares held by the largest investor is 25% in Germany, compared to 14.5% for firms in the U.K. Also, 49% (19%) of German firms have a blockholder that owns at least

20% (50%) of the firm's shares, whereas U.K. firms only have a 20% (50%) blockholder in 19% (3%) of all cases. Furthermore, German firms are less likely to have a cross listing at one of the large U.S. stock exchanges (9% vs. 13%), which demand strict corporate disclosure. Taken together, consistent with the literature (e.g., Allen and Gale 2000; La Porta et al. 1999 and 2006; Leuz et al. 2003), these numbers corroborate that Germany is an insider system with concentrated stock ownership, less disclosure and a less developed capital market, whereas the U.K. is an outsider system with dispersed ownership and a developed capital market with more disclosure requirements. Yet, German firms make considerably more guidance announcements per year (3.7 vs. 1.6), suggesting that they may use voluntary disclosure to overcome those structural differences.

4.2. Main results

We estimate Models (1) and (2) using a within (firm fixed effects) regression in order to test Hypothesis 1. We report the results in Tables 2 to 5.

4.2.1. Firm visibility

We test whether better IR rankings are associated with higher firm visibility. Table 2 reports the results. In Panel A, the dependent variable is *Analyst following*. Column (1) reports regression results for German firms, column (2) reports results for U.K. firms, and column (3) reports results for the pooled sample. In all three columns, the coefficient on *IR Ranking* is positive, indicating that better-ranked firms have higher analyst coverage, on average. However, the coefficient is only statistically significant ($p < 0.05$) in the first column, i.e., for German firms. The coefficient of 0.077 indicates that German firms that experience a one-standard-deviation increase in their IR ranking are covered by 1.07 ($= \exp(0.077)$) more analyst, which is economically significant. Furthermore, the coefficient on the interaction term *IR Ranking * Germany* is positive and significant (coef=0.056, $p < 0.10$). That is, the improvement in analyst coverage associated with better IR rankings in Germany is incrementally significant (roughly one extra analyst).

In Panel B, the dependent variable is *Institutional ownership*. In column (1), the coefficient on *IR Ranking* is positive but insignificant. In columns (2) and (3), the coefficient on *IR Ranking* is negative and insignificant. Hence, neither German nor U.K. firms appear to successfully attract institutional investors through their IR efforts. However, relative to U.K. firms, German firms are significantly more likely to attract greater institutional ownership, as per the positive and significant coefficient on the interaction term *IR Ranking * Germany* in column (3). A one-standard-deviation increase in *IR Ranking* results in 2.48% greater institutional ownership for German firms relative to U.K. ones.

In Panel C, the dependent variable is *Foreign ownership*, which is mainly ownership by foreign institutional investors. Directionally, the coefficients on *IR Ranking* follow a similar pattern to those in Panel B. However, in column (1), the coefficient is statistically significant ($p < 0.05$). This result indicates that better-ranked German firms experience a significant increase in foreign ownership. The positive and significant coefficient on *IR Ranking * Germany* in column (3) indicates that the effect is significantly incremental over that experienced by U.K. firms. For a one-standard-deviation increase in *IR Ranking*, German firms see a 2% increase in the proportion of their shares held by foreign investors (3.11% more than U.K. firms).

Collectively, the results in Table 2 indicate that better investor relations translate into significantly enhanced capital market visibility for German firms, more so than for U.K. firms. The results are mixed for institutional ownership, but significant for foreign ownership, consistent with demand for IR partly coming from outside Germany's borders.

4.2.2. Analyst forecast error and dispersion

Conditioned upon IR being associated with greater visibility, we examine whether better IR also translates into greater accuracy and consensus among analysts. Table 3 reports the results. The panel structure is the same as in Table 2, with Germany, U.K., and the pooled sample in columns (1), (2), and (3), respectively. In Panel A, the dependent variable is *Forecast dispersion*. Higher *IR Rankings* are associated

with significantly ($p < 0.05$) lower analyst forecast dispersion for German firms (column 1), and the effect is significantly incremental over that of IR in the U.K. (column 3). Based on the coefficient on *IR Ranking * Germany* in column (3), a one-standard-deviation increase in *IR Ranking* for German firms is associated with an incremental reduction in analyst forecast dispersion by 0.155, which represents 14% of the full-sample standard deviation (as per Table 1).

In Panel B, the dependent variable is *Forecast error*. The coefficient on *IR Ranking* is negative in all three columns, albeit not significantly so in column (2). This result indicates that, on average, better IR is associated with more accurate analyst forecasts, consistent with U.S.-based evidence (Chapman et al. 2018). A one-standard-deviation increase in *IR Ranking* is associated with analyst consensus that is more accurate by 1.82% of stock price, i.e., 35% of the standard deviation in analyst forecast error in the full sample (0.052, as per Table 1). With respect to our hypothesis, the coefficient on *IR Ranking * Germany* is negative and significant (coef=-0.018, $p < 0.01$). That is, IR is incrementally beneficial for German firms relative to U.K. firms in terms of analyst forecast accuracy.

Collectively, the results in Table 3 indicate that German firms that are better ranked in terms of investor relations experience lower analyst forecast dispersion and inaccuracy, and the effect is significantly more pronounced than it is for U.K. firms.

4.2.3. Stock return volatility and illiquidity

We next test whether the results observed in terms of analyst output also translate into market-based measures of information uncertainty and liquidity. Consistent with Chapman et al. (2018), we examine stock price volatility, as firms use IR in part to reduce such volatility. We measure illiquidity as per Amihud (2002), which combines elements of liquidity and transaction costs. Table 4 reports the results. The panel structure is the same as in Tables 2 and 3, with Germany, U.K., and the pooled sample in columns (1), (2), and (3), respectively. In Panel A, the dependent variable is *Stock volatility*. In all three columns, the coefficient on *IR Ranking* is negative and significant. That is, German and U.K. firms that are better

ranked in terms of IR relative to their domestic peers enjoy significantly lower volatility of stock returns. While the coefficient is larger for German than for U.K. firms (-12bp versus -5bp), the difference is not significant at conventional levels, as per the coefficient on *IR Ranking * Germany* in column (3).

In Panel B, the dependent variable is *Amihud illiquidity*. The coefficients on *IR Ranking* are negative in all three columns, but only significantly in the German sample ($p < 0.01$). Furthermore, the coefficient on *IR Ranking * Germany* is negative and significant in column (3). That is, the higher liquidity associated with better IR is incrementally significant in Germany relative to the U.K. A one-standard-deviation increase in IR is associated with 1.16% higher liquidity for German firms, as benchmarked against U.K. firms.

Collectively, the results in Table 4 indicate that better investor relations result in lower stock return volatility for both German and U.K. firms, and greater liquidity for German firms. When considered jointly with the results in Tables 2 and 3, the evidence suggests that German firms reap greater marginal rewards from IR in terms of capital market visibility and information assimilation than U.K. firms do, and those benefits translate into lower information uncertainty and greater stock liquidity.

4.2.4. Tobin's Q and cost of equity capital

Finally, we test whether better IR translates into higher firm valuation, as has been shown for small U.S. firms (Bushee and Miller 2012) and firms cross-listed in the U.S. (Reiter 2017). Table 5, Panel A presents regression estimates for Models (1) and (2) with *Tobin's Q* as the dependent variable. The panel structure is the same as in Tables 2, 3, and 4, with Germany, U.K., and the pooled sample in columns (1), (2), and (3), respectively. In all three columns, the coefficient on *IR Ranking* is positive. Furthermore, it is statistically significant ($p < 0.05$) in column (1). This result indicates that better-ranked firms in Germany enjoy a valuation premium. Specifically, a one-standard-deviation increase in *IR Ranking* is associated with a 0.126 higher Q, which represents 13% of the full sample standard deviation of Q (0.9599, as per Table

1). In column (3), the incremental effect of IR ranking for German firms is positive and significant (coef=0.12, $p<0.05$).

We further examine whether the valuation premium is a denominator effect by replacing Q with *Cost of capital* as the dependent variable in Panel B. The coefficient on *IR Ranking* is negative and significant ($p<0.01$) in column (1). That is, German firms that are ranked more highly in terms of IR have lower cost of equity capital. In contrast, there is no significant effect for U.K. firms (column 2). Hence, in the combined sample, the coefficient on *IR Ranking * Germany* is negative and significant (column 3). The marginal benefit of better IR is associated with an incrementally significant reduction in cost of equity for German firms. At 58bp for a one-standard-deviation change in IR, the effect is economically meaningful.¹¹

Overall, based on the evidence presented in this section, we reject the null of our hypothesis (H1): the marginal benefits of better IR in terms of capital market outcomes, i.e., firm visibility, information asymmetry and uncertainty as well as firm value and cost of capital, are significantly higher in Germany. Furthermore, consistent with the U.K. IR market being more developed and professionalized and the average U.K. firm being closer to a stable equilibrium in terms of their IR investment, we find that U.K. firms do not enjoy a significant valuation premium for IR on average.¹²

4.3. Additional tests

In this subsection, we perform additional analyses to further substantiate our interpretation of the main results. First, we address the assumption that IR rankings are a function of investment in IR. Second, we use a Pan-European sample to broaden the cross-sectional power of our tests and confirm that the results are not specific to Germany or the U.K.

¹¹ The regressions using Tobin's Q and cost of equity capital as dependent variables omit the variable *Stock return* as a control. Results remain qualitatively similar when this variable is included (not reported).

¹² We note, however, that some of that is due to the inclusion of firm fixed effects, which account for each firm's average IR quality and value over the sample period. Using industry fixed effects instead, we find that several of the capital market benefits accrue significantly to U.K. firms, but remain stronger for German firms (not tabulated).

4.3.1. IR ranking and investment

Throughout our hypothesis development, we implicitly refer to firms' investments in IR quality. Yet, our empirical proxy for IR is based on outsiders' perceptions. To validate that our IR quality measure does, in fact, capture firms' investments, we obtain data on IR resources from Extel for a subset of our sample (mostly larger firms). We regress the variable *IR Ranking* on three measures of IR investment: staff size, budget, and remuneration. IR budget and remuneration are measured in ranges rather than actual figures. The variables are defined in Appendix A. The regressions include the same set of control variables and fixed effects as the regressions presented in Section 4.2.

Table 6 reports the results, separately for German firms (columns 1, 3 and 5) and U.K. firms (columns 2, 4 and 6). In columns (1) and (3), the coefficients on *IR employees* and *IR remuneration* are both positive and significant ($p < 0.1$ and $p < 0.05$, respectively). This result indicates that German firms that employ more IR staff and, in particular, pay them more tend to be more highly ranked. While we find the coefficient on *IR employees* to be significant for U.K. firms as well (see column 2), the coefficient on IR remuneration, which captures the quality and incentives of IR staff, is not (column 4). Hence, for German firms, IR quality, as measured by rankings, does correlate positively with IR investment in human capital, whereas the results more mixed for U.K. firms. This evidence is consistent with our main assumption and argument and could partly explain why we see a lower premium for more highly ranked U.K. firms: the marginal benefit of IR investment in the U.K. is lower, or at least uncertain.¹³ It should be noted that the available data for IR remuneration and budget is small, and measurement error might be significant, given that we do not have exact figures for these IR proxies. Despite those limitations, which work against finding significant results, it is reassuring that we still find a significant association between IR rankings and both IR staff and remuneration for German firms.

¹³ Consistent with this conclusion and with the U.K. IR market being more competitive, we find that IR remuneration is significantly higher in the U.K. than in Germany, while the number of IR employees is slightly lower in the U.K. Higher levels of IR remuneration, likely reflecting higher levels of competition for IR-related talent, also provide a rationale for the significantly lower IR valuation premium we find for the U.K.

4.3.2. Entropy balancing

Although our firm fixed effect regression approach leaves little room for correlated omitted variables, it remains possible that unobserved firm (as opposed to country) characteristics between our German and U.K. sample firms could explain the extent to which they benefit from IR as we measure it. As an alternative specification, we follow Chapman et al. (2018) and use the entropy balancing technique in order to “match” the German and U.K. sample (see Hainmueller 2012). Entropy balancing is a quasi-matching technique that assigns weights to the control sample (here, the U.K.) in order to achieve covariate balance with the treatment sample (here, Germany). The advantage of this technique is that it enables us to make German and U.K. firms look more ‘alike’ while keeping all firms (as opposed to a one-to-one matching like propensity score, which would result in dropping several U.K. firms). We achieve balance between German and U.K. firms on the first two moments of all controls from Models (1) and (2) (not tabulated). We then re-run Model (2) where U.K. observations are weighted based on the weights obtained from the entropy balance. The results are tabulated in the online appendix (Table O.A.1). In brief, the results are consistent with the main specification, although the coefficient on *IR Ranking * Germany* is not statistically significant at conventional levels for analyst forecast dispersion and stock return volatility (also, the results are significant for foreign ownership which we do not tabulate). Nevertheless, this additional set of results reinforces the conclusion drawn from our main analysis.

4.3.3. Cross-country evidence

Throughout our main tests, we use Germany and the U.K. as representative countries of two contrasting regimes – an insider system with civil law tradition and capital market institutions geared towards more concentrated equity ownership (i.e., Germany) versus an outsider system with common law tradition and more diffuse equity ownership (i.e., the U.K.). Two challenges arise as we draw inferences from the German/U.K. sample. First, the results may be idiosyncratic to Germany, the U.K., or both. Second, the limited degrees of freedom prevent us from shedding light on which country characteristics affect the marginal benefits to IR. To address these issues (particularly the first one), we obtain from Extel

a sample of within-country IR rankings for thirteen European countries over the 2015-2017 period. This data allows us to measure country-level institutions with more granularity.

We modify the two-country regression models as follows:

$$\text{Capital Market Outcome} = \beta_1 * \text{IR Ranking} + \sum_j \beta_j * \text{Control}_j + \text{Fixed Effects} \quad (3)$$

$$\begin{aligned} \text{Capital Market Outcome} = & \beta_1 * \text{IR Ranking} + \beta_2 * \text{Country Attribute} + \beta_3 * \text{IR Ranking} * \text{Country Attribute} \\ & + \sum_k \beta_k * \text{Control}_k + \text{Fixed Effects} \end{aligned} \quad (4)$$

Models (3) and (4) are the same as Models (1) and (2), except for the following modifications. In both models, we replace firm fixed effects with country and (Datastream ICB 2-digit) industry fixed effects because we only have three years of data, and therefore at most three observations per firm. That is, we compare firms within the same country and industry. Furthermore, both models omit the variable *US cross-listing* because we do not have the data for the cross-country sample. Whereas we ran Model (1) separately for Germany and the U.K., we run Model (3) as a pooled cross-country regression. This approach allows us to see if the baseline association between IR ranking and capital market outcomes holds in this expanded sample. Meanwhile, Model (4) is the same as Model (2), except that we no longer have the interaction term between *IR Ranking* * *Germany*. Instead, we interact *IR Ranking* with proxies for country attributes, which capture the main differences between Germany and the U.K. In particular, we consider financial reporting, using Isidro et al.'s (2016) financial reporting score, and corporate ownership concentration, based on the variable *Ownership largest investor*. We do not consider common vs. civil law as another country attribute in this model because the U.K. is the only country in our sample that has a common law origin. However, country fixed effects take differences in legal families into account.

Before turning to the regression results for Models (3) and (4), we first provide a brief overview of the Pan-European sample, which includes the following countries: Austria, Belgium, Denmark, France, Germany, Italy, Norway, Portugal, Spain, Sweden, Switzerland, the Netherlands and the United Kingdom. Table 7 provides summary statistics for this sample. Panel A shows country characteristics for all thirteen

countries. Consistent with our reasoning and prior results for the two-country sample, among all countries the U.K. has the highest financial reporting score (2.083) (and the best disclosure quality) and the lowest corporate ownership concentration (16.4%). On the contrary, Germany ranks among the bottom quartile in terms of financial reporting (-0.612) (and disclosure quality) while it is the country with the fifth highest ownership concentration (29.2%). In general, the thirteen countries vary considerably in terms of financial reporting and disclosure quality and in terms of ownership concentration, which is preferable econometrically as this variation helps identify the marginal benefits of IR depending on country characteristics. Panel B provides summary statistics with regard to firm characteristics, i.e., the capital market outcomes and control variables already used in the previous section. Mean values for firm characteristics are comparable to those for the pooled sample of German and U.K. companies described in Section 4.1.

Table 8 reports the results for the OLS regression estimates of Model (3). The dependent variables are *Analyst following* (column 1), *Institutional ownership* (column 2), *Forecast dispersion* (column 3), *Forecast error* (column 4), *Stock volatility* (column 5), *Amihud illiquidity* (column 6), *Tobin's Q* (column 7), and *Cost of capital* (column 8). In general, the baseline association between IR ranking and capital market outcomes is significant in the cross-country sample. In column (1), the positive and significant coefficient on *IR Ranking* indicates that, on average, firms that are more highly ranked within their country in terms of IR are followed by more analysts. A one-standard-deviation increase in IR ranking is associated with 1.27 ($=\exp(0.2375)$) more analysts covering the firm. In column (2), the coefficient on *IR Ranking* is positive but not significant. That is, IR rankings do not appear to have a significant bearing on institutional ownership on average. In columns (3) and (4), the coefficient on *IR Ranking* is negative and significant, suggesting that firms which are more highly ranked than their domestic peers in terms of IR have lower analyst forecast dispersion and lower forecast error. Hence, in the cross-country sample, better IR also appears to be beneficial in terms of capital market visibility and information environment as captured by analysts' forecasts. Moreover, in columns (5) and (6), the significantly negative coefficients on *IR Ranking*

indicate that firms which are more highly ranked than their domestic peers in terms of IR have lower stock return volatility and greater liquidity, respectively. Finally, in column (7) (column 8), the significantly positive (negative) coefficient on *IR Ranking* indicates that firms which are more highly ranked than their domestic peers in terms of IR are valued more highly by the market (have lower cost of equity capital). That is, in the broader cross-country sample, the capital market benefits of IR materialize in terms of market-based measures of uncertainty and liquidity as well as in terms of a valuation premium. Throughout all columns, except for column (2), the coefficient on *IR Ranking* is statistically significant at the 5% level or better. Hence, we conclude that the results observed in the German sample are not unique to Germany.

Table 9 reports the results for the OLS regression estimates of Model (4). The table structure is similar to Table 8, showing the same eight capital market outcomes (in columns 1 to 8). In Panel A, we report coefficients on *IR Ranking* and its interaction with an indicator for countries whose financial reporting score is below (or equal to) the sample median (i.e., Austria, Belgium, France, Germany, Italy, Portugal and Spain), denoted *IR Ranking * Reporting ≤ Median*. The main effects (i.e., the coefficients on *IR Ranking*) are directionally consistent with the ones observed in Table 8. That is, in countries with above-median financial reporting scores, firms that are more highly ranked in IR experience higher analyst following and institutional ownership, lower analyst forecast dispersion and lower forecast error, lower stock return volatility and illiquidity as well as higher Tobin's Q and lower cost of equity capital than their domestic peers. However, not all coefficients are statistically significant. Indeed, only analyst following ($p < 0.01$), analyst forecast dispersion ($p < 0.05$), Tobin's Q ($p < 0.01$) and cost of equity ($p < 0.05$) load significantly. Turning to the main coefficient of interest, i.e., the interaction term *IR Ranking * Reporting ≤ Median*, the evidence is consistent with the results based on Germany and the U.K. First, the coefficient is positive and significant in columns (1) and (2). This indicates that in countries that have below-median financial reporting quality, the marginal benefit to IR in terms of analyst coverage and institutional ownership is significantly greater than in countries with above-median reporting quality.¹⁴ Conversely, the

¹⁴ In untabulated tests, we obtain similar results with foreign ownership.

coefficient on $IR\ Ranking * Reporting \leq Median$ is negative and significant in columns (3) and (4). This result indicates that, in countries with below-median financial reporting quality, the marginal benefit to IR in terms of reduced analyst forecast dispersion and error is significantly greater than in countries with above-median reporting quality. Similarly, the coefficient on $IR\ Ranking * Reporting \leq Median$ is negative and significant in columns (5) and (6). That is, in countries with below-median financial reporting quality, the marginal benefit to IR in terms of reduced volatility and illiquidity is significantly greater than in countries with above-median reporting quality. Lastly, the significantly positive and negative coefficients on $IR\ Ranking * Reporting \leq Median$ in column (7) and (8) indicate that, in countries with below-median financial reporting quality, the marginal benefit to IR in terms of higher firm value and lower cost of equity, respectively, is significantly greater than in countries with above-median reporting quality. In all columns, the coefficients on $IR\ Ranking * Reporting \leq Median$ are significant at the 5% level or better, except for cost of equity capital ($p < 0.10$). Collectively, the results in Panel A indicate that firms in countries with relatively weaker disclosure environments can better differentiate themselves through IR to achieve greater visibility with analysts and institutional investors, reduce the information gap with sell-side analysts and enjoy market benefits such as lower volatility, greater liquidity, higher valuation and lower cost of equity. In unreported regressions, we find qualitatively similar results when we interact $IR\ Ranking$ with indicator variables equaling one for countries with disclosure quality or reporting transparency (following Isidro et al. 2016) below the sample median.

In Table 9, Panel B, we report coefficients on $IR\ Ranking$ and its interaction with an indicator for countries whose corporate ownership concentration is above the annual sample median, denoted $IR\ Ranking * Concentration > Median$.¹⁵ The results are similar to those shown in Panel A, both in terms of statistical significance and coefficient magnitudes. That is, for the main effect, better IR rankings are associated with

¹⁵ For Austria, France, Germany, Italy and Portugal the indicator for countries whose corporate ownership concentration is above the annual sample median equals one for all three sample years. The indicator takes the value of one at least in a single year for Belgium, Denmark, Norway and Spain. We choose a definition at the annual level for the ownership concentration indicator variable to obtain more variation.

significantly higher analyst following (column 1), lower forecast dispersion (column 3), higher Tobin's Q (column 7) and lower cost of equity (column 8) for firms located in countries with lower ownership concentration. For the interaction effect, better IR rankings are associated with significantly greater analyst following and institutional ownership, lower analyst forecast dispersion and error, lower stock volatility and illiquidity, higher firm value and lower cost of equity capital for firms located in countries with above-median ownership concentration relative to those in countries with below-median ownership concentration.

Altogether, the results in Tables 8 and 9 confirm our results based on Germany and the U.K. That is, on average, IR pays off in terms of capital market visibility, information assimilation, reduced uncertainty, enhanced liquidity and higher firm valuation. However, the benefits accrue significantly more strongly to firms in markets that have relatively weaker capital market institutions in terms of transparency and more concentrated corporate ownership (such as Germany) relative to those with stronger capital market institutions and more diffused ownership (such as the U.K.).

A common issue in cross-country studies is the difficulty to isolate variables that arise endogenously as a function of cultural, geographic, historic, linguistic, and other deeply rooted forces that are nearly impossible to disentangle. In addition to creating a financial reporting quality factor, Isidro et al. (2016) examine cross-country variation in institutions using factors derived from a host of country-level characteristics spanning various cultural, geopolitical, and economic dimensions that have been used in the international literature. The factors they derive are difficult to interpret, but we re-run Model (4) by replacing financial reporting quality with each factor, one by one. Of particular interest to us is factor 2, which comprises variables that capture creditor and investor rights, securities regulation, capital market size and legal origin. For brevity, we report the regression results in the online appendix (Table O.A.2). The highlight from the results is that factors 2, 3 and 4 are all associated with lower capital market marginal benefits to IR. While the results go the other way for factor 1, which includes aspects of economic welfare, creditor rights and social attributes such as trust, it should be noted that Germany ranks higher than the U.K.

on that factor, suggesting that it does not capture the capital market differences that we hypothesize matter for IR across countries.

5. Conclusion

We examine the marginal benefit of investor relations (IR) in a cross-country setting. Using nine years of within-country rankings of IR quality based on buy-side and sell-side professionals' survey responses, and a regression specification with firm fixed effects, we find that German firms that are more highly ranked in IR experience significant capital market benefits in the form of significantly higher analyst coverage and (foreign) institutional ownership, lower analyst forecast dispersion and error, lower stock volatility and illiquidity, higher Tobin's Q and lower cost of capital. Furthermore, while U.K. firms also experience some of those capital market effects, the marginal benefit of better IR is significantly greater for German firms relative to U.K. firms. We interpret this evidence as consistent with the hypothesis that IR has greater marginal benefits in a capital market environment where there is less history of IR due to capital market institutions geared towards more concentrated ownership, and therefore more room for differentiation. Further consistent with this hypothesis, we find in a broader sample of thirteen countries that IR is associated with greater capital market benefits in countries with relatively lower financial reporting quality and higher ownership concentration. Altogether, our results indicate that investment in IR may yield stronger market benefits when the IR market is relatively less mature and competitive.

Our results should be informative to academics, firms, IR professionals and investors. With IR becoming more common and harmonized across countries, academics and practitioners alike should benefit from a better understanding of its cross-country dynamics. While our evidence is consistent across two samples (Germany and the U.K. with relatively long time series, and thirteen countries with more recent data), we should caution against attributing our results to any specific country characteristics – which future research can address using appropriate settings.

Appendix A: Variable definitions

This table provides an overview of all variables used in this study. For each variable, the definition and data source are reported.

Variable	Definition	Source
Amihud illiquidity	Amihud illiquidity measure estimated according to Amihud (2002). The measure is calculated for the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year.	Thomson Reuters Datastream
Analyst following	Natural logarithm of the number of analysts who provide a (fiscal year) earnings per share (EPS) forecast for the firm.	Thomson Reuters I/B/E/S
CapEx/TA	Capital expenditures / Total assets.	Thomson Reuters Worldscope
Cost of capital	The firm's cost of equity capital as defined in Claus and Thomas (2001). The cost of equity capital is calculated for the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year.	Thomson Reuters Datastream and I/BE/S databases
Firm age	Years since the firm's IPO.	Hoppenstedt Aktienfuehrer, London Stock Exchange, and corporate websites
Firm size	Natural logarithm of total assets.	Thomson Reuters Worldscope
Forecast dispersion	Natural logarithm of the standard deviation of analyst EPS forecasts (for the fiscal year) deflated by the stock price.	Thomson Reuters I/B/E/S
Forecast error	Absolute difference between actual EPS and mean analyst consensus for EPS forecast (for the fiscal year) divided by the stock price.	Thomson Reuters I/B/E/S and Worldscope
Foreign ownership	Percent of shares outstanding held by the 100 largest foreign shareholders as of the end of March of the current year.	Thomson Reuters Eikon
Guidance	The number of corporate guidance announcements between the beginning of April of the previous year and the end of March of the current year.	S&P Capital IQ
Institutional ownership	Percent of shares outstanding held by the 100 largest institutional shareholders as of the end of March of the current year.	Thomson Reuters Eikon
Intangibles/TA	Intangible assets / Total assets.	Thomson Reuters Worldscope
IR budget	Five categories of a firm's IR budget (0 = < € 250,000, 1 = € 250,000–500,000, 2 = € 500,000–1,000,000, 3 = € 1,000,000–2,000,000, and 4 = > € 2,000,000).	Extel WeConvene (formerly Extel by Thomson Reuters)
IR employees	Natural logarithm of the number of IR managers.	Extel WeConvene (formerly Extel by Thomson Reuters)
IR remuneration	Seven categories of annual IR officer remuneration (0 = < € 50,000, 1 = € 50,000–70,000, 2 = € 71,000–100,000..., 7 = > € 200,000).	Extel WeConvene (formerly Extel by Thomson Reuters)
IR ranking	Ranking of firms' IR quality based on surveys conducted annually by Extel WeConvene among buy-side and sell-side firms. Surveys are conducted between February and May.	Extel WeConvene (formerly Extel by Thomson Reuters)
Leverage	Long-term and short-term debt / Common equity.	Thomson Reuters Worldscope
Ownership largest investor	Percent of shares outstanding held by largest shareholder as of the end of March of the current year.	Thomson Reuters Eikon
R&D/TA	Research and development expenses / Total assets.	Thomson Reuters Worldscope
ROE	Return on equity.	Thomson Reuters Worldscope
Stock volatility	Standard deviation of daily stock returns calculated for the twelve months starting at the beginning of April of the previous year and ending at the end of March of the current year.	Thomson Reuters Datastream
Tobin's Q	Market value of equity plus book value of preferred stock and debt divided by book value of total assets.	Thomson Reuters Datastream and Worldscope
US cross-listing	Indicator variable equal to one if a firm also has its stock listed on the NYSE, AMEX or NASDAQ, zero otherwise.	Hoppenstedt Aktienfuehrer, Thomson Reuters Eikon, and annual reports

References

- Aggarwal, R., Erel, I., Ferreira, M., and P. Matos. 2011. Does Governance Travel Around the World? Evidence from Institutional Investors. *Journal of Financial Economics* 100, 154-181.
- Allen, F., Gale, D., 2000. Comparing Financial Systems. MIT Press, Cambridge, MA.
- Amihud, Y. 2002. Illiquidity and Stock Returns: Cross-section and Time-series Effects. *Journal of Financial Markets* 5(1), 31-56.
- Armstrong, C., Core, J., Taylor, D., and R. Verrecchia. 2011. When Does Information Asymmetry Affect the Cost of Capital? *Journal of Accounting Research* 49(1), 1-40.
- Bassemir, M., Novotny-Farkas, Z., and J. Pachta. 2013. The Effect of Conference Calls on Analysts' Forecasts – German Evidence. *European Accounting Review* 22(1), 1-33.
- Botosan, C., and M. Plumlee. 2002. A Re-examination of Disclosure Level and the Expected Cost of Equity Capital. *Journal of Accounting Research* 40(1), 21-40.
- Billings, M., Jennings, R., and B. Lev. 2015. On Guidance and Volatility. *Journal of Accounting and Economics* 60(2-3), 161-180.
- Brennan, M., and A. Subrahmanyam. 1996. Market Microstructure and Asset Pricing: On the Compensation for Illiquidity in Stock Returns. *Journal of Financial Economics* 41(3), 441-464.
- Brochet, F., Naranjo, P., and G. Yu. 2016. The Capital Market Consequences of Language Barriers in the Conference Calls of Non-U.S. Firms. *The Accounting Review* 91(4), 1023-1049.
- Brown, L., Call, A., Clement, M., and N. Sharp. 2018. Managing the Narrative: Investor Relations Officers and Corporate Disclosure. Working paper Temple University.
- Bushee, B., and G. Miller. 2012. Investor Relations, Firm Visibility, and Investor Following. *The Accounting Review* 87(3), 867-897.
- Bushee, B., and C. Noe. 2000. Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility. *Journal of Accounting Research* 38, Supplement, 171-202.
- Bushman, R., Piotroski, J., and A. Smith. 2004. What Determines Corporate Transparency? *Journal of Accounting Research* 42(2), 207-252.
- Cao, Y., Myers, L., Tsang, A., and Y.G. Yang. 2017. Management Forecast and the Cost of Equity Capital: International Evidence. *Review of Accounting Studies*, forthcoming.
- Chapman, K., Miller, G., and H. White. 2018. Investor Relations and Information Assimilation. *The Accounting Review*, forthcoming.
- Denis, D., and J. McConnell. 2003. International Corporate Governance. *Journal of Financial and Quantitative Analysis* 38(1), 1-36.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., and A. Shleifer. 2008. The Law and Economics of Self-Dealing. *Journal of Financial Economics* 88(3), 430-465.
- Fang, V., Maffett, M., and B. Zhang. 2015. Foreign Institutional Ownership and the Global Convergence of Financial Reporting Practices. *Journal of Accounting Research* 53(3), 593-631.

- Frankel, R., Mayew, W., and Y. Sun. 2010. Do Pennies Matter? Investor Relations Consequences of Small Negative Earnings Surprises. *Review of Accounting Studies* 15, 220-242.
- Goergen, M., and L. Renneborg. 2003. Why Are the Levels of Control (So) Different in German and U.K. Companies? Evidence from Initial Public Offerings. *Journal of Law, Economics and Organization* 19(1), 141-175.
- Goergen, M., Manjon, M., and L. Renneboog. 2008. Recent Developments in German Corporate Governance. *International Review of Law and Economics* 28, 175-193.
- Graham, J., Harvey, C., and S. Rajgopal. 2005. The Economic Implications of Corporate Financial Reporting. *Journal of Accounting and Economics* 40(1-3), 3-73.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20(1), 25-46.
- IR Magazine. 2013. Why are German Companies So Good at Investor Relations? Available at <https://www.irmagazine.com/articles/case-studies/19718/why-are-german-companies-so-good-investor-relations/>.
- Isidro, H., Nanda, D.J., and P. Wysocki. 2016. Financial Reporting Differences around the World: What Matters? Working paper University of Miami.
- Karolyi, A., and R. Liao. 2017. The Economic Consequences of Investor Relations: A Global Perspective. Working paper Cornell University.
- Kirk, M., and J. Vincent. 2014. Professional Investor Relations within the Firm. *The Accounting Review* 89(4), 1421-1452.
- Lang, M., and R. Lundholm. 1996. Corporate Disclosure Policy and Analyst Behavior. *The Accounting Review* 71(4), 467-492.
- La Porta, R., Lopez-de-Silanes, F., and A. Shleifer. 1999. Corporate Ownership Around the World. *Journal of Finance* 54(2), 471-517.
- La Porta, R., Lopez-de-Silanes, F., and A. Shleifer. 2006. What Works in Securities Laws? *Journal of Finance* 61(1), 1-32.
- Leuz, C., Nanda, D.J., and P. Wysocki. 2003. Earnings Management and Investor Protection: An International Comparison. *Journal of Financial Economics* 69(3), 505-527.
- Leuz, C., and P. Wysocki. 2016. The Economics of Disclosure and Financial Reporting Regulation: Evidence and Suggestions for Future Research. *Journal of Accounting Research* 54(2), 525-622.
- Li, X., and H. Yang. 2016. Mandatory Financial Reporting and Voluntary Disclosure: The Effect of Mandatory IFRS Adoption on Management Forecasts. *The Accounting Review* 91(3), 933-953.
- Lundholm, R., Rogo, R., and J. Zhang. 2014. Restoring the Tower of Babel: How Foreign Firms Communicate with U.S. Investors. *The Accounting Review* 89(4), 1453-1485.
- Marston, C. 2004. A Survey of European Investor Relations. Edinburgh: Research Committee of the Institute of Chartered Accountants of Scotland.

- National Investor Relations Institute. Guidance Practices, 2014 Survey Report. NIRI Analytics. Available at <https://www.niri.org/niri/media/niri/niri-analytics/guidance/2014-guidance-analytics.pdf>.
- Reiter, N. 2017. Investor Communication and the Benefits of Cross-Listing. Working paper University of Toronto.
- Spamann, H. 2010. The “Antidirector Rights Index’ Revisited. *Review of Financial Studies* 23(2), 467-486.
- Tirole, J. 2001. Corporate Governance. *Econometrica* 69(1), 1-35.
- Yu, G., and A. Wahid. 2014. Accounting Standards and International Portfolio Holdings. *The Accounting Review* 89(5), 1895-1930.

Table 1: Summary statistics

This table presents summary statistics for the full sample of German and U.K. firms (Panel A) and for the sub-samples of German and U.K. firms in (Panel B). The sample period is 2006-2014. The last column of Panel B reports the test statistics of t-tests (allowing for unequal variances) for sample mean differences between the sample of German firms and the sample of U.K. firms.

Panel A: Full sample	N	Mean	P25	Median	P75	SD
Amihud illiquidity	2666	0.1932	0.0006	0.0025	0.0129	6.1691
Analyst following	2668	2.5778	2.1972	2.7081	3.0445	0.6742
CapEx/TA	2770	0.0428	0.0123	0.0325	0.0578	0.0435
Cost of capital	2324	0.0933	0.0715	0.0940	0.1140	0.0381
Firm age	2770	23.6430	7	15	38	22.2915
Firm size	2770	15.0469	13.7295	14.7459	16.0599	1.9857
Forecast dispersion	2402	-5.1403	-5.8999	-5.2270	-4.4516	1.1043
Forecast error	2427	0.0288	0.0035	0.0084	0.0211	0.0898
Foreign ownership	2675	0.2716	0.1504	0.2385	0.3575	0.1662
Guidance	2770	2.4415	0	2	4	2.1643
Intangibles/TA	2770	0.2139	0.0350	0.1428	0.3594	0.2071
Institutional ownership	2675	0.5013	0.2845	0.5110	0.6998	0.2458
IR ranking	2770	30.2986	12	25	45	22.5429
Leverage	2770	1.0480	0.2202	0.5521	1.1211	4.6796
Ownership largest investor	2770	0.1883	0.0728	0.1181	0.2510	0.1684
R&D/TA	2770	0.0191	0	0	0.0204	0.0451
ROE	2770	0.2022	0.0682	0.1437	0.2297	0.8116
Stock return	2676	0.1300	-0.1262	0.0959	0.3178	0.5239
Stock volatility	2676	0.0224	0.0153	0.0198	0.0264	0.0104
Tobin's Q	2770	1.7066	1.0615	1.3756	1.9548	0.9599
US cross-listing	2770	0.1116				0.3149

Panel B: Sub-samples	Germany			UK			Mean Diff t-Test
	N	Mean	Median	N	Mean	Median	
Amihud illiquidity	1099	0.0202	0.0033	1567	0.3146	0.0022	-1.2129
Analyst following	1105	2.6209	2.7726	1563	2.5474	2.7081	2.7766***
CapEx/TA	1134	0.0437	0.0348	1636	0.0422	0.0291	0.9048
Cost of capital	1003	0.0941	0.0905	1321	0.0927	0.0979	1.0869
Firm age	1134	24.5653	14	1636	23.0037	16	1.7662*
Firm size	1134	15.0330	14.5775	1636	15.0565	14.8654	-0.3030
Forecast dispersion	1085	-4.8704	-4.8983	1317	-5.3626	-5.4893	11.1468***
Forecast error	1082	0.0415	0.0113	1345	0.0186	0.0072	6.2778***
Foreign ownership	1108	0.2812	0.2357	1567	0.2647	0.2408	2.5281**
Guidance	1134	3.7143	4	1636	1.5593	1	28.539***
Intangibles/TA	1134	0.1857	0.1254	1636	0.2335	0.1713	-6.2349***
Institutional ownership	1108	0.3079	0.2778	1567	0.6380	0.6586	-45.596***
IR ranking	1134	18.3747	11.5401	1636	38.5636	38	-28.988***
Leverage	1134	1.2091	0.6260	1636	0.9363	0.5195	1.7277*
Ownership largest investor	1134	0.2510	0.1862	1636	0.1448	0.1023	15.646***
Ownership largest inv. \geq 20%	1134	0.4850		1636	0.1913		16.5453***
Ownership largest inv. \geq 50%	1134	0.1896		1636	0.0330		12.5720***
R&D/TA	1134	0.0245	0.0052	1636	0.0153	0	5.4634***
ROE	1134	0.1093	0.1247	1636	0.2667	0.1614	-5.9535***
Stock return	1109	0.1601	0.1085	1567	0.1088	0.0876	2.4960**
Stock volatility	1109	0.0242	0.0221	1567	0.0211	0.0183	7.6951***
Tobin's Q	1134	1.6106	1.2882	1636	1.7795	1.4567	-4.4249***
US cross-listing	1134	0.0900		1636	0.1265		-3.0934***

Table 2: Investor relations and firm visibility

This table reports coefficients from regressions of the dependent variables *Analyst following* (Panel A), *Institutional ownership* (Panel B), and *Foreign ownership* (Panel C) on our measure of investor relations quality, *IR ranking*, and a set of control variables. All regression specifications include year and firm fixed effects as well as stock index fixed effects. Specification (1) is based only on observations for German firms, specification (2) is based only on observations for UK firms, and specification (3) is based on all observations (i.e., German and UK firms). Specification (3) additionally includes the interaction term *IR Ranking * Germany*. *Germany* is an indicator variable, which equals one for German firms, and zero for UK firms. All regressions include a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Analyst following			
	(1)	(2)	(3)
	GER	UK	GER + UK
IR ranking	0.0766**	0.0158	0.0163
	(2.387)	(1.481)	(1.488)
IR Ranking * Germany			0.0559*
			(1.675)
Firm size	0.3291***	0.1507***	0.2117***
	(4.848)	(3.118)	(5.388)
ROE	-0.0305	0.0105	0.0089
	(-0.405)	(0.815)	(0.676)
Leverage	-0.0084	-0.0001	-0.0002
	(-0.707)	(-0.139)	(-0.443)
R&D/TA	2.6065**	-0.7109	0.3886
	(2.220)	(-1.035)	(0.457)
Intangibles/TA	0.0120	-0.0788	-0.1163
	(0.044)	(-0.416)	(-0.721)
CapEx/TA	0.1299	0.7465*	0.3935
	(0.136)	(1.755)	(0.693)
Firm age	0.0386***	-0.0157	-0.0135
	(4.939)	(-0.746)	(-0.609)
Ownership largest investor	-0.3606	-0.7266***	-0.5146**
	(-0.980)	(-3.871)	(-2.224)
Guidance	0.0004	0.0017	-0.0001
	(0.061)	(0.298)	(-0.030)
US cross-listing	0.0496	0.0722	0.0539
	(0.607)	(1.094)	(1.058)
Stock return	-0.0962***	-0.0923***	-0.0920***
	(-4.508)	(-4.730)	(-5.719)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,105	1,563	2,668
Within R-squared	0.319	0.345	0.309

Panel B: Institutional ownership

	(1) GER	(2) UK	(3) GER + UK
IR ranking	0.0099	-0.0075	-0.0079
	(1.152)	(-1.418)	(-1.534)
IR ranking * Germany			0.0248**
			(2.328)
Firm size	0.0204	-0.0028	0.0037
	(1.054)	(-0.146)	(0.267)
ROE	0.0478**	0.0083	0.0092*
	(1.986)	(1.511)	(1.726)
Leverage	0.0013	0.0002	0.0001
	(0.396)	(0.684)	(0.392)
R&D/TA	-0.2456	-0.4395**	-0.3935***
	(-1.225)	(-2.161)	(-2.598)
Intangibles/TA	-0.0489	-0.0315	-0.0465
	(-0.526)	(-0.319)	(-0.681)
CapEx/TA	0.2015	-0.1916	0.0415
	(1.533)	(-1.045)	(0.332)
Firm age	0.0001	-0.0065	-0.0076
	(0.060)	(-0.653)	(-0.813)
Ownership largest investor	-0.1786**	-0.0115	-0.1318*
	(-1.995)	(-0.070)	(-1.649)
Guidance	0.0007	0.0025	0.0018
	(0.393)	(0.979)	(1.124)
US cross-listing	0.0053	-0.0150	-0.0014
	(0.274)	(-0.409)	(-0.067)
Stock return	-0.0014	0.0105	0.0019
	(-0.279)	(1.366)	(0.408)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,108	1,567	2,675
Within R-squared	0.167	0.048	0.050

Panel C: Foreign ownership

	(1) GER	(2) UK	(3) GER + UK
IR ranking	0.0200**	-0.0029	-0.0045
	(2.151)	(-0.749)	(-1.157)
IR Ranking * Germany			0.0311***
			(2.983)
Controls as in Panel B	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,108	1,567	2,675
Within R-squared	0.177	0.151	0.125

Table 3: Investor relations and analyst forecasts

This table reports coefficients from regressions of the dependent variables *Forecast dispersion* (Panel A) and *Forecast error* (Panel B) on our measure of investor relations quality, *IR ranking*, and a set of control variables. All regression specifications include year and firm fixed effects as well as stock index fixed effects. Specification (1) is based only on observations for German firms, specification (2) is based only on observations for UK firms, and specification (3) is based on all observations (i.e., German and UK firms). Specification (3) additionally includes the interaction term *IR Ranking * Germany*. *Germany* is an indicator variable, which equals one for German firms, and zero for UK firms. All regressions include a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Forecast dispersion			
	(1)	(2)	(3)
	GER	UK	GER + UK
IR ranking	-0.1317**	-0.0380	-0.0344
	(-2.046)	(-1.353)	(-1.197)
IR ranking * Germany			-0.1546**
			(-2.273)
Firm size	0.2582**	0.2229**	0.2480***
	(2.196)	(2.191)	(3.245)
ROE	-0.9964***	0.0050	-0.0229
	(-3.704)	(0.257)	(-0.883)
Leverage	-0.0071	0.0040	0.0048
	(-0.177)	(1.451)	(1.421)
R&D/TA	3.3177	-1.9868	1.4472
	(1.150)	(-0.925)	(0.725)
Intangibles/TA	1.0341**	0.1132	0.5240
	(2.302)	(0.230)	(1.525)
CapEx/TA	-3.4458***	2.2162**	-1.2474
	(-2.999)	(2.308)	(-1.214)
Firm age	0.0021	0.0144	0.0287
	(0.133)	(0.358)	(0.729)
Ownership largest investor	0.0056	0.3926	0.3475
	(0.015)	(0.482)	(0.927)
Guidance	-0.0359**	0.0150	-0.0162
	(-2.422)	(1.031)	(-1.497)
US cross-listing	0.0437	0.2306	0.0840
	(0.310)	(1.351)	(0.622)
Stock return	-0.1531**	-0.2213**	-0.1848***
	(-2.140)	(-2.083)	(-2.857)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,085	1,317	2,402
Within R-squared	0.414	0.277	0.309

Panel B: Forecast error

	(1) GER	(2) UK	(3) GER + UK
IR ranking	-0.0182***	-0.0009	-0.0022*
	(-2.603)	(-1.122)	(-1.906)
IR ranking * Germany			-0.0177***
			(-3.275)
Firm size	0.0141	0.0000	0.0062
	(0.977)	(0.000)	(1.362)
ROE	-0.1027**	-0.0008	-0.0042*
	(-2.066)	(-0.825)	(-1.685)
Leverage	0.0017	-0.0000	-0.0001
	(0.351)	(-0.233)	(-0.247)
R&D/TA	0.0468	-0.0761	0.0243
	(0.299)	(-1.568)	(0.313)
Intangibles/TA	0.0416	-0.0121	0.0038
	(1.078)	(-0.808)	(0.196)
CapEx/TA	-0.1670	-0.0167	-0.0707
	(-1.417)	(-0.604)	(-1.639)
Firm age	-0.0007	-0.0010	-0.0015
	(-0.436)	(-0.540)	(-0.840)
Ownership largest investor	-0.0384	0.0359	0.0134
	(-0.854)	(1.307)	(0.576)
Guidance	0.0019	0.0010*	0.0017**
	(1.204)	(1.941)	(2.208)
US cross-listing	0.0009	-0.0047	0.0012
	(0.091)	(-1.294)	(0.203)
Stock return	-0.0086	-0.0065	-0.0075*
	(-1.504)	(-1.591)	(-1.869)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,082	1,345	2,427
Within R-squared	0.193	0.099	0.113

Table 4: Investor relations, stock volatility, and liquidity

This table reports coefficients from regressions of the dependent variables *Stock volatility* (Panel A) and *Amihud illiquidity* (Panel B) on our measure of investor relations quality, *IR ranking*, and a set of control variables. All regression specifications include year and firm fixed effects as well as stock index fixed effects. Specification (1) is based only on observations for German firms, specification (2) is based only on observations for UK firms, and specification (3) is based on all observations (i.e., German and UK firms). Specification (3) additionally includes the interaction term *IR Ranking * Germany*. *Germany* is an indicator variable, which equals one for German firms, and zero for UK firms. All regressions include a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Stock volatility			
	(1)	(2)	(3)
	GER	UK	GER + UK
IR ranking	-0.0012**	-0.0005**	-0.0005**
	(-2.144)	(-2.114)	(-2.210)
IR ranking * Germany			-0.0009
			(-1.514)
Firm size	-0.0016*	0.0003	-0.0004
	(-1.804)	(0.365)	(-0.702)
ROE	-0.0045***	-0.0003	-0.0004
	(-2.777)	(-1.391)	(-1.472)
Leverage	0.0000	-0.0000*	-0.0000
	(0.108)	(-1.791)	(-0.782)
R&D/TA	-0.0282*	-0.0098	-0.0133
	(-1.891)	(-0.918)	(-1.433)
Intangibles/TA	0.0024	-0.0033	-0.0008
	(0.625)	(-1.069)	(-0.312)
CapEx/TA	-0.0106	0.0021	-0.0047
	(-1.373)	(0.254)	(-0.805)
Firm age	-0.0004***	-0.0001	-0.0001
	(-3.874)	(-0.327)	(-0.214)
Ownership largest investor	-0.0020	0.0035	0.0009
	(-0.837)	(0.678)	(0.359)
Guidance	0.0001	0.0003*	0.0002**
	(0.880)	(1.943)	(2.265)
US cross-listing	-0.0015*	0.0016	-0.0000
	(-1.696)	(1.524)	(-0.054)
Stock return	0.0012***	-0.0011*	0.0004
	(3.170)	(-1.652)	(0.831)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,109	1,567	2,676
Within R-squared	0.695	0.657	0.660

Panel B: Amihud illiquidity

	(1) GER	(2) UK	(3) GER + UK
IR ranking	-0.0087*** (-2.723)	-0.0002 (-0.052)	0.0012 (0.484)
IR ranking * Germany			-0.0116** (-2.408)
Firm size	-0.0141 *** (-2.819)	-0.0550** (-2.031)	-0.0283*** (-3.074)
ROE	-0.0054 (-0.698)	-0.0042 (-1.613)	-0.0034 (-1.507)
Leverage	0.0024** (1.998)	-0.0002 (-0.930)	0.0000 (0.102)
R&D/TA	-0.0174 (-0.368)	0.4517* (1.734)	0.2619* (1.678)
Intangibles/TA	-0.0210 (-1.431)	0.0789 (0.904)	0.0229 (0.634)
CapEx/TA	-0.0414 (-1.637)	-0.4174 (-1.100)	-0.1447 (-1.634)
Firm age	0.0005 (0.961)	-0.0057 (-1.041)	-0.0044 (-1.342)
Ownership largest investor	0.0220 (1.516)	0.0070 (0.121)	0.0225 (1.062)
Guidance	-0.0011 *** (-2.695)	-0.0047 (-1.134)	-0.0016* (-1.933)
US cross-listing	0.0023 (0.626)	0.0002 (0.014)	0.0001 (0.027)
Stock return	-0.0007 (-0.686)	-0.0051 (-0.399)	0.0014 (0.548)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,099	1,567	2,666
Within R-squared	0.214	0.087	0.120

Table 5: Investor relations, firm value, and cost of capital

This table reports coefficients from regressions of the dependent variables *Tobin's Q* (Panel A) and *Cost of capital* (Panel B) on our measure of investor relations quality, *IR ranking*, and a set of control variables. All regression specifications include year and firm fixed effects as well as stock index fixed effects. Specification (1) is based only on observations for German firms, specification (2) is based only on observations for UK firms, and specification (3) is based on all observations (i.e., German and UK firms). Specification (3) additionally includes the interaction term *IR Ranking * Germany*. *Germany* is an indicator variable, which equals one for German firms, and zero for UK firms. All regressions include a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Tobin's Q			
	(1)	(2)	(3)
	GER	UK	GER + UK
IR ranking	0.1259**	0.0386	0.0283
	(2.313)	(1.456)	(1.155)
IR ranking * Germany			0.1199**
			(2.126)
Firm size	-0.4212***	-0.4920***	-0.4391***
	(-4.794)	(-4.931)	(-6.950)
ROE	0.2305	0.0198	0.0283
	(1.360)	(0.883)	(1.233)
Leverage	0.0155	0.0011	0.0015
	(0.990)	(0.979)	(1.219)
R&D/TA	-3.2810	-0.7898	-1.7563
	(-1.538)	(-0.507)	(-1.255)
Intangibles/TA	-2.3454***	-1.2586*	-1.6471***
	(-4.867)	(-1.678)	(-3.763)
CapEx/TA	1.1005	-0.3691	0.4080
	(1.541)	(-0.466)	(0.832)
Firm age	0.0221**	-0.0214	-0.0246
	(2.387)	(-0.690)	(-0.852)
Ownership largest investor	0.3107	-0.2709	0.0656
	(0.697)	(-0.914)	(0.229)
Guidance	0.0171*	0.0017	0.0099
	(1.843)	(0.149)	(1.365)
US cross-listing	0.0516	0.1160	0.0965
	(0.834)	(1.189)	(1.612)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,134	1,636	2,770
Within R-squared	0.278	0.268	0.263

Panel B: Cost of capital

	(1) GER	(2) UK	(3) GER + UK
IR ranking	-0.0059***	-0.0001	-0.0001
	(-2.988)	(-0.111)	(-0.172)
IR ranking * Germany			-0.0058**
			(-2.579)
Firm size	0.0141***	0.0070**	0.0102***
	(3.946)	(2.587)	(4.560)
ROE	0.0018	-0.0006	-0.0004
	(0.272)	(-1.407)	(-0.845)
Leverage	-0.0002	0.0001	0.0001
	(-0.235)	(0.936)	(0.931)
R&D/TA	0.0770	-0.0061	0.0259
	(1.027)	(-0.124)	(0.555)
Intangibles/TA	-0.0033	0.0150	0.0053
	(-0.206)	(1.153)	(0.503)
CapEx/TA	0.0483*	0.0608**	0.0575***
	(1.656)	(2.302)	(2.683)
Firm age	-0.0028***	0.0016	0.0018
	(-6.224)	(1.309)	(1.501)
Ownership largest investor	-0.0113	0.0002	-0.0043
	(-0.916)	(0.014)	(-0.486)
Guidance	0.0002	0.0009**	0.0004
	(0.394)	(2.007)	(1.262)
US cross-listing	0.0008	0.0006	0.0006
	(0.164)	(0.146)	(0.189)
Year FE	Yes	Yes	Yes
Index FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Observations	1,003	1,321	2,324
Within R-squared	0.380	0.425	0.382

Table 6: IR ranking and investment in IR

This table reports coefficients from regressions of our measure of investor relations quality, *IR ranking*, on three measures of IR investment (number of employees, budget, and remuneration), and a set of control variables. We only obtain data on those IR measures for different subsets of our sample firms. All regression specifications include year and firm fixed effects as well as stock index fixed effects. All regressions include a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

IR Ranking						
	(1)	(2)	(3)	(4)	(5)	(6)
	GER	UK	GER	UK	GER	UK
IR employees	0.1014*	0.1704*				
	(1.722)	(1.828)				
IR remuneration			0.0659**	0.0334		
			(2.034)	(0.347)		
IR budget					0.0359	0.0101
					(0.822)	(0.080)
Firm size	0.0151	0.1392	0.0339	-0.9767	-0.0311	-0.5698
	(0.202)	(1.047)	(0.194)	(-1.245)	(-0.234)	(-1.202)
ROE	0.4173***	0.0160	0.4850*	-0.2135	0.2887*	0.0165
	(3.582)	(0.581)	(1.903)	(-0.398)	(1.793)	(0.165)
Leverage	0.0230	-0.0047**	0.0540	-0.0160	0.0555**	-0.0054
	(1.548)	(-2.525)	(0.985)	(-0.751)	(2.572)	(-1.233)
R&D/TA	-0.3955	-2.5154	-2.0336	-29.2797	-2.5633*	-4.1589
	(-0.278)	(-1.306)	(-1.051)	(-1.186)	(-1.731)	(-0.334)
Intangibles/TA	-0.6038**	-0.3785	-0.5090	2.8196	-0.9130*	2.3548
	(-2.035)	(-0.789)	(-0.769)	(1.300)	(-1.700)	(1.298)
CapEx/TA	-0.2780	0.8457	1.3491	2.2171	-0.1436	-1.9406
	(-0.358)	(0.462)	(1.332)	(0.299)	(-0.093)	(-0.428)
Firm age	-0.0027	0.0393	-0.0230	0.0534	0.0208	0.1678***
	(-0.276)	(1.088)	(-0.940)	(0.816)	(1.110)	(3.536)
Ownership largest investor	-0.2333	0.1140	1.0685*	-0.3978	0.9648*	0.6264
	(-0.779)	(0.218)	(1.850)	(-0.240)	(1.798)	(0.761)
Guidance	-0.0062	-0.0213	0.0066	-0.0736	-0.0107	-0.0103
	(-0.646)	(-0.945)	(0.399)	(-0.902)	(-0.667)	(-0.181)
US cross-listing	-0.1087	0.3241	-0.1002	0.6186	-0.1744	-0.0109
	(-0.777)	(1.437)	(-0.425)	(0.897)	(-0.846)	(-0.039)
Stock return	0.0282	0.1014	0.1060	0.3401	0.0466	-0.0439
	(1.124)	(1.344)	(1.655)	(0.965)	(1.478)	(-0.150)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Index FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	949	1,056	278	155	378	259
Within R-squared	0.152	0.252	0.148	0.305	0.126	0.195

Table 7: Summary statistics for the sample of 13 European countries

This table reports summary statistics for the sample of 13 European countries. The sample covers three years of data (2015-2017) for the following countries: Austria, Belgium, Denmark, France, Germany, Italy, Norway, Portugal, Spain, Sweden, Switzerland, the Netherlands, and the United Kingdom. Panel A provides summary statistics for country characteristics. Financial reporting, Reporting transparency and Disclosure quality refer to Isidro et al. (2016). Financial reporting is a reporting score, which is the result of factor analysis on six financial reporting outcome variables: abnormal return, abnormal volume, reporting transparency, disclosure quality, return synchronicity, and asymmetric timeliness (i.e., the score includes the measures Reporting transparency and Disclosure quality). Ownership concentration is measured via the variable *Ownership largest investor*, i.e., it is the mean and median ownership stake of the largest investor of the firms in country. Firm characteristics are summarized in Panel B.

Panel A: Country characteristics

	<u>Financial reporting</u>		<u>Disclosure quality</u>		<u>Reporting transparency</u>		<u>Ownership concentration</u>		
	N	Mean	N	Mean	N	Mean	N	Mean	Median
Austria	90	-1.048	90	62	90	-0.808	90	0.4106	0.4124
Belgium	75	-0.302	75	68	75	-0.682	75	0.2874	0.2826
Denmark	73	0.586	73	75	73	-0.530	73	0.2547	0.2378
France	311	0.302	311	78	311	-0.536	311	0.3191	0.3259
Germany	469	-0.612	469	67	469	-0.620	469	0.2924	0.2914
Italy	222	-0.511	222	66	222	-0.826	222	0.4242	0.4310
Netherlands	85	0.967	85	74	85	-0.482	85	0.1984	0.2016
Norway	-	-	-	-	-	-	71	0.3099	0.3251
Portugal	43	-1.140	43	56	43	-0.880	43	0.4538	0.4457
Spain	174	-0.543	174	72	174	-0.792	174	0.2863	0.2859
Sweden	147	1.168	147	83	147	-0.168	147	0.1820	0.1861
Switzerland	213	0.422	213	80	213	-0.504	213	0.2351	0.2348
United Kingdom	651	2.083	651	85	651	-0.133	651	0.1639	0.1571

Panel B: Cross-country sample

	N	Mean	P25	Median	P75	SD
Amihud illiquidity	2530	0.3101	0.0008	0.0048	0.0675	2.1758
Analyst following	2495	2.2998	1.7918	2.4849	2.9957	0.8455
CapEx/TA	2624	0.0399	0.0102	0.0287	0.0517	0.0768
Cost of capital	1346	0.0760	0.0591	0.0739	0.0914	0.0351
Firm age	2624	20.5034	8	15	22	23.7040
Firm size	2624	15.0984	13.8042	14.9821	16.2133	2.0745
Forecast dispersion	2403	-5.3785	-6.1657	-5.4668	-4.7151	1.1374
Forecast error	2394	0.0361	0.0035	0.0081	0.0194	0.1965
Foreign ownership	2531	0.4103	0.1756	0.3337	0.6442	0.3238
Guidance	2624	2.0976	0	2	4	1.8962
Intangibles/TA	2624	0.2204	0.0275	0.1497	0.3739	0.2176
Institutional ownership	2531	0.3808	0.1948	0.3416	0.5411	0.2326
IR ranking	2624	76.2519	22	50	110	74.0062
Leverage	2624	1.1222	0.2361	0.5841	1.2119	3.8019
Ownership largest investor	2624	0.2664	0.0951	0.1901	0.4080	0.2425
R&D/TA	2624	0.0177	0	0	0.0153	0.0437
ROE	2624	0.1221	0.0499	0.1101	0.1811	0.6064
Stock return	2531	0.1018	-0.0989	0.0742	0.2514	0.3847
Stock volatility	2531	0.0193	0.0141	0.0174	0.0218	0.0091
Tobin's Q	2624	1.8159	1.0572	1.3833	1.9941	1.3795

Table 8: Benefits of IR - Cross-country evidence from 13 European countries

This table reports coefficients from OLS regressions of the eight different capital market outcomes used in Tables 2-5 on our measure of investor relations quality, *IR ranking*, and the set of control variables used in the regressions shown in Tables 2-5. All regression specifications include year, (Datastream ICB 2-digit) industry, and country fixed effects and a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively. The sample covers three years of data (2015-2017) for the following countries: Austria, Belgium, Denmark, France, Germany, Italy, Norway, Portugal, Spain, Sweden, Switzerland, the Netherlands, and the United Kingdom.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking	0.2375***	0.0093	-0.1320***	-0.0045**	-0.0006**	-0.0521***	0.3327***	-0.0048***
	(9.038)	(1.189)	(-3.236)	(-2.276)	(-2.168)	(-2.862)	(6.677)	(-3.209)
Firm size	0.2397***	0.0047	0.0196	-0.0020**	-0.0009***	-0.1073***	-0.2191***	0.0015*
	(18.131)	(1.161)	(0.918)	(-2.168)	(-6.162)	(-8.736)	(-8.638)	(1.748)
ROE	0.0582	0.0064	-0.2615**	-0.0140*	-0.0017**	-0.0318	0.2402**	-0.0006
	(1.404)	(1.067)	(-2.111)	(-1.849)	(-2.085)	(-1.254)	(2.436)	(-0.371)
Leverage	-0.0162***	-0.0013**	0.0193**	0.0007*	0.0002***	0.0075	-0.0050	0.0006
	(-2.660)	(-2.297)	(2.190)	(1.730)	(3.425)	(1.306)	(-0.905)	(1.162)
R&D/TA	-0.2374	0.2185	1.0240	-0.0276	0.0255***	-0.8873**	5.0913***	-0.0224
	(-0.571)	(1.462)	(1.061)	(-0.921)	(3.353)	(-2.412)	(3.583)	(-0.753)
Intangibles/TA	0.0831	0.0932***	-0.5445***	-0.0247***	-0.0015	0.0016	-0.3175*	-0.0017
	(0.872)	(3.069)	(-3.388)	(-2.839)	(-1.570)	(0.020)	(-1.720)	(-0.268)
CapEx/TA	0.2326	-0.0449	-0.8713	0.0003	0.0013	-0.0486	0.1427	-0.0476
	(1.341)	(-0.714)	(-1.146)	(0.004)	(0.804)	(-0.331)	(0.482)	(-1.535)
Firm age	-0.0008	-0.0005***	-0.0016	-0.0000	-0.0000**	0.0003	0.0007	-0.0000
	(-0.812)	(-2.662)	(-1.312)	(-0.109)	(-2.258)	(0.486)	(0.630)	(-0.151)
Ownership largest investor	-0.1529**	-0.2515***	-0.3216***	-0.0099*	-0.0022***	0.1294**	0.0358	-0.0182***
	(-2.018)	(-3.727)	(-2.660)	(-1.826)	(-2.781)	(2.107)	(0.294)	(-4.074)
Guidance	0.0550***	0.0027	0.0283*	0.0013	0.0002**	-0.0118	0.0121	0.0003
	(4.720)	(0.855)	(1.777)	(1.644)	(2.534)	(-1.226)	(0.710)	(0.533)
Stock return	-0.0450	-0.0006	-0.4661***	-0.0211***	-0.0005	-0.0407		
	(-1.316)	(-0.054)	(-5.358)	(-4.437)	(-0.684)	(-0.765)		
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,495	2,531	2,403	2,394	2,531	2,530	2,624	1,346
R-squared	0.578	0.501	0.288	0.199	0.395	0.415	0.361	0.237

Table 9: Financial reporting, ownership concentration, and marginal benefits of IR

This table reports coefficients from OLS regressions of the eight different capital market outcomes used in Tables 2-5 on interactions of *IR Ranking* with a dummy equaling one for countries with a financial reporting score (Isidro et al. 2016) below or equal to the sample median (*Reporting ≤ Median*) (Panel A) or on interactions of *IR Ranking* with a dummy equaling one for countries with ownership concentration above the annual sample median (*Concentration > Median*) (Panel B) along with *IR Ranking* and the set of control variables used in the regressions shown in Tables 2-5. All regression specifications include year, (Datastream ICB 2-digit) industry, and country fixed effects and a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Financial reporting score

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Reporting ≤ Median	0.3401*** (7.456)	0.0403** (2.543)	-0.2777*** (-3.730)	-0.0102*** (-2.854)	-0.0009** (-2.072)	-0.3464*** (-5.678)	0.2791*** (3.913)	-0.0048* (-1.860)
IR ranking	0.1736*** (6.836)	0.0018 (0.231)	-0.0892** (-2.121)	-0.0031 (-1.539)	-0.0004 (-1.541)	0.0129 (0.770)	0.2915*** (5.420)	-0.0041** (-2.461)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,427	Yes	2,338	2,329	2,463	2,462	2,553	1,307
R-squared	0.602	2,463	0.282	0.199	0.387	0.444	0.364	0.242

Panel B: Ownership concentration

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Concentration > Median	0.3192*** (7.138)	0.0401** (2.559)	-0.2283*** (-3.153)	-0.0077** (-2.180)	-0.0007* (-1.696)	-0.3502*** (-5.820)	0.2547*** (3.736)	-0.0045* (-1.766)
IR ranking	0.1790*** (7.034)	0.0020 (0.255)	-0.0901** (-2.157)	-0.0031 (-1.506)	-0.0004 (-1.519)	0.0117 (0.712)	0.2870*** (5.472)	-0.0040** (-2.385)
Concentration > median	-0.2470*** (-4.925)	-0.0079 (-0.524)	0.1125 (1.184)	-0.0044 (-0.592)	0.0008 (1.354)	0.2505*** (5.691)	-0.2730*** (-3.424)	0.0055 (1.166)
Controls as in Panel A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,495	2,531	2,403	2,394	2,531	2,530	2,624	1,346
R-squared	0.593	0.504	0.292	0.202	0.396	0.448	0.365	0.240

Online Appendix

Table OA.1: Investor relations and capital market benefits – entropy balanced sample

This table replicates the third columns of Panels A and B from Tables 2, 3, 4, and 5, except that U.K. firms are weighted based on the entropy balance technique, so that mean and variance firm size, ROE, leverage, R&D/TA, intangibles/TA, CapEx/TA, firm age, largest owner, guidance, US cross-listing and stock return are the same in the German and U.K. sample.

VARIABLES	(1) Analyst following	(2) Institutional ownership	(3) Forecast error	(4) Forecast dispersion	(5) Stock volatility	(6) Amihud illiquidity	(7) Tobin's Q	(8) Cost of capital
Interaction (GER)	0.0831** (2.387)	0.0205** (2.247)	-0.0190*** (-2.931)	-0.0585 (-0.753)	-0.0009 (-1.424)	-0.0130*** (-3.678)	0.1505*** (2.955)	-0.0041* (-1.839)
IR ranking	-0.0084 (-0.355)	-0.0070 (-1.065)	0.0018 (0.397)	-0.0834 (-1.436)	-0.0001 (-0.268)	0.0029 (1.623)	-0.0084 (-0.239)	-0.0018 (-1.282)
Firm size	0.2619*** (6.240)	0.0246** (2.559)	0.0106 (1.582)	0.3087*** (3.901)	-0.0017** (-2.515)	-0.0120** (-2.288)	-0.2596*** (-4.319)	0.0147*** (6.171)
ROE	-0.0003 (-0.007)	0.0304** (2.033)	-0.0830*** (-3.582)	-0.9294*** (-5.761)	-0.0060*** (-4.654)	-0.0203** (-2.072)	0.2160** (2.079)	-0.0005 (-0.144)
Leverage	0.0002 (0.035)	-0.0007 (-0.358)	0.0046 (1.501)	-0.0143 (-0.676)	0.0002 (0.902)	0.0025*** (2.642)	0.0167 (1.520)	0.0004 (0.581)
R&D/TA	2.8336*** (3.390)	-0.4031** (-2.173)	0.2527** (2.285)	2.4237 (1.369)	-0.0080 (-0.652)	0.2538 (1.430)	-1.4344 (-0.848)	0.1065* (1.761)
Intangibles/TA	0.1656 (1.024)	0.0586 (1.335)	0.0156 (0.777)	0.7638*** (2.703)	-0.0010 (-0.389)	0.0337* (1.788)	-1.6168*** (-3.827)	0.0031 (0.342)
CapEx/TA	0.0284 (0.046)	0.0455 (0.427)	-0.0959* (-1.646)	-1.6822* (-1.892)	-0.0094 (-1.536)	-0.0385 (-1.164)	0.7854 (1.457)	0.0445* (1.867)
Firm age	0.0114 (0.389)	-0.0213* (-1.903)	0.0022 (0.720)	0.0123 (0.227)	-0.0013*** (-2.738)	0.0028 (1.364)	-0.0259 (-0.696)	0.0006 (0.379)
Largest owner	-0.4937*** (-3.205)	-0.1569*** (-3.008)	-0.0290 (-0.871)	0.4844 (1.572)	0.0005 (0.198)	0.0068 (0.649)	0.5670 (1.440)	-0.0056 (-0.706)
Guidance	0.0063 (1.322)	0.0018 (1.291)	0.0012 (1.253)	-0.0363*** (-3.023)	0.0002** (2.100)	-0.0015** (-2.340)	0.0247*** (2.916)	0.0006* (1.884)
US cross-listing	0.0483 (1.011)	0.0048 (0.342)	0.0002 (0.035)	0.0125 (0.105)	-0.0012* (-1.693)	0.0033 (0.882)	0.0626 (1.008)	-0.0006 (-0.174)
Stock return	-0.0764*** (-4.561)	0.0090 (1.316)	-0.0018 (-0.473)	-0.0894* (-1.834)	0.0011*** (2.794)	0.0025 (1.310)		
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No
Index FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,668	2,675	2,427	2,402	2,676	2,666	2,673	2,247
R-squared	0.885	0.929	0.593	0.787	0.840	0.834	0.872	0.857

Table OA.2: Isidro et al.' (2016) country-specific factors and marginal benefits of IR

This table reports coefficients from OLS regressions of the eight different capital market outcomes used in Tables 2-5 on interactions of *IR Ranking* with four different indicator variables, i.e., *Factor 1 ≤ Median*, *Factor 2 ≤ Median*, *Factor 3 ≤ Median*, *Factor 4 ≤ Median*, along with *IR Ranking* and the set of control variables used in the regressions shown in Tables 2-5. The four indicator variables equal one for countries with factor values (for factors 1, 2, 3 and 4) below or equal to the sample median. The four factors are from Isidro et al. (2016). Panel A shows the results for Factor 1, Panel B shows the results for Factor 2, Panel C shows the results for Factor 3, and Panel D shows the results for Factor 4. All regression specifications include year, (Datastream ICB 2-digit) industry, and country fixed effects and a constant (not reported). All variables are defined in Appendix A. Standard errors are clustered at the firm level. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Factor 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Factor 1 ≤ Median	-0.2469*** (-4.959)	-0.0434** (-2.430)	0.0132 (0.162)	0.0017 (0.441)	0.0006 (1.235)	0.5305*** (6.828)	-0.2230*** (-2.840)	0.0015 (0.583)
IR ranking	0.4510*** (8.874)	0.0470** (2.530)	-0.1512* (-1.798)	-0.0064 (-1.625)	-0.0011** (-2.281)	-0.5130*** (-6.621)	0.5362*** (6.310)	-0.0063*** (-2.603)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,427	2,463	2,338	2,329	2,463	2,462	2,553	1,307
R-squared	0.592	0.510	0.275	0.195	0.386	0.472	0.361	0.240

Panel B: Factor 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Factor 2 ≤ Median	0.3401*** (7.456)	0.0403** (2.543)	-0.2777*** (-3.730)	-0.0102*** (-2.854)	-0.0009** (-2.072)	-0.3464*** (-5.678)	0.2791*** (3.913)	-0.0048* (-1.860)
IR ranking	0.1736*** (6.836)	0.0018 (0.231)	-0.0892** (-2.121)	-0.0031 (-1.539)	-0.0004 (-1.541)	0.0129 (0.770)	0.2915*** (5.420)	-0.0041** (-2.461)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,427	2,463	2,338	2,329	2,463	2,462	2,553	1,307
R-squared	0.602	0.510	0.282	0.199	0.387	0.444	0.364	0.242

Panel C: Factor 3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Factor 3 ≤ Median	0.3862*** (7.823)	0.0452*** (2.673)	-0.2104*** (-2.583)	-0.0092** (-2.323)	-0.0009* (-1.876)	-0.4503*** (-6.490)	0.3135*** (4.008)	-0.0028 (-1.072)
IR ranking	0.1808*** (7.255)	0.0027 (0.351)	-0.1102*** (-2.660)	-0.0036* (-1.886)	-0.0005* (-1.729)	0.0138 (0.843)	0.2970*** (5.707)	-0.0046*** (-2.784)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,427	2,463	2,338	2,329	2,463	2,462	2,553	1,307
R-squared	0.605	0.510	0.279	0.198	0.387	0.459	0.364	0.240

Panel D: Factor 4

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Analyst following	Institutional ownership	Forecast dispersion	Forecast error	Stock volatility	Amihud illiquidity	Tobin's Q	Cost of capital
IR ranking * Factor 4 ≤ Median	0.3636*** (8.000)	0.0413*** (2.611)	-0.1728** (-2.372)	-0.0071** (-2.083)	-0.0006 (-1.245)	-0.3273*** (-5.440)	0.2916*** (4.060)	-0.0039 (-1.515)
IR ranking	0.1688*** (6.712)	0.0016 (0.199)	-0.1082** (-2.564)	-0.0036* (-1.823)	-0.0005* (-1.776)	0.0099 (0.595)	0.2888*** (5.454)	-0.0043** (-2.557)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,427	2,463	2,338	2,329	2,463	2,462	2,553	1,307
R-squared	0.605	0.510	0.278	0.197	0.386	0.440	0.364	0.241