Are Foreign Investors Locusts?
The Long-Term Effects of Foreign Institutional Ownership*

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Abstract

This paper challenges the view that foreign investors lead firms to adopt a short-term orientation and forgo long-term investment. Using a comprehensive sample of publicly listed firms in 30 countries over the 2001-2010 period, we find instead that greater foreign institutional ownership fosters long-term investment in tangible, intangible, and human capital. Foreign institutional ownership also leads to significant increases in innovation output. We identify these effects by exploiting the exogenous variation in foreign institutional ownership that follows the addition of a firm to the MSCI indices. Our results suggest that foreign institutions exert a disciplinary role on entrenched corporate insiders worldwide.

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"We support those companies, who act in interest of their future and in interest of their employees against irresponsible locust swarms, who measure success in quarterly intervals, suck off substance and let companies die once they have eaten them away."

– Franz Müntefering, German Social Democratic Party Chairman, 2005

"The effects of the short-termist phenomenon are troubling (...) In the face of these pressures, more and more corporate leaders have responded with actions that can deliver immediate returns to shareholders, such as buybacks or dividend increases, while underinvesting in innovation, skilled workforces or essential CAPEX necessary to sustain long-term growth."

– Laurence Fink, CEO, BlackRock, 2015

1. Introduction

How does financial globalization affect long-term corporate investment and productivity? Over the last decades, there has been a trend away from the "stakeholder capitalism" and concentrated ownership model historically predominant in continental Europe and Japan, which promoted long-term relationship with labor, creditors, and other stakeholders (Tirole (2001), Carlin and Mayer (2003), Allen, Carletti, and Marquez (2015)). Many companies have been moving toward the Anglo-Saxon "shareholder capitalism" model with its dispersed and globalized shareholder structure. The agents of this change are foreign institutional investors who increasingly play a prominent monitoring role as shareholders worldwide (Aggarwal, Erel, Ferreira, and Matos (2011)).

In this paper, we examine two hypotheses. Our first hypothesis is that the presence of foreign institutional investors as shareholders may lead managers to cut long-term investment by reducing capital expenditures, research and development (R&D) expenditures, and employment. This view posits that foreign portfolio flows represent "hot money" in search of short-term profits, with little regard for firms' long-term prospects.[1] Regulators and policy makers express concerns that the rising importance of activist investors is leading firms to short-termist strategies, delivering immediate returns to shareholders at the expense of long-term investment

[1] Brennan and Cao (1997) argue that foreign investors, less informed about the prospects of local stocks, may rebalance portfolios disproportionally and amplify the stock reaction to negative public news. Borensztein and Gelos (2003) suggest that international capital flows are more "panic-prone" in emerging markets.

(Organisation for Economic Co-Operation and Development (2015)). In a high-profile case that made the front page of the news, Franz Müntefering, German Social Democratic Party Chairman, compared foreign investors to an invasion of "locusts" stripping companies bare.[2] Since then, the "locust" label has been used to denote international capital more broadly (*Financial Times* (2007), *The Economist* (2007)). The concern regarding "locust" foreign capital is that it might lead to asset stripping to boost short-term profits, delocalization of production and adoption of unfriendly labor policies (e.g., layoffs). This attitude is part of a more general phenomenon of protectionist sentiment with regard to foreign capital flows.[3]

Foreign institutional investors may create market pressure that induces short-termism if they prompt managers to prioritize short-term earnings at the cost of long-term growth. Ferreira, Manso, and Silva (2014) argue that the stock market pressures managers to select projects that are easy to communicate to investors. Managers then forgo innovation and instead try to acquire ready-made technologies, as such choices are more transparent to investors. Moreover, foreign institutions may be less failure-tolerant and thus put executives at a greater risk of being terminated, which could lead to career concerns. These factors may steer risk-averse managers away from pursuing innovative growth opportunities.

Our second hypothesis is that monitoring by foreign institutional investors promotes long-term investment in fixed capital, innovation, and human capital. This positive impact derives from the disciplinary effect that the presence of institutions has on corporate insiders. Managers tend to prefer a quiet life (Hart (1983), Bertrand and Mullainathan (2003)) and institutional investors may persuade managers to innovate through diplomacy, actively voting their shares, or ultimately via confrontational proxy fights.[4] In an international context, besides "lazy managers"

[2] The remark was originally aimed at foreign private equity and activist hedge funds targeting German companies. For example, Children's Investment Fund, a U.K. hedge fund, helped block Deutsche Börse's attempt to buy the London Stock Exchange, arguing that buying back shares would be a better use of its cash (*The Economist* (2005)).
[3] Dinc and Erel (2013) find evidence for the presence of economic nationalism in mergers and acquisitions in Europe, in that governments prefer target companies to remain in domestic hands.
[4] In an alternative to the voice channel, institutional investors can threaten to exit (e.g., selling and depressing stock prices). Our identification strategy using stock additions to the MSCI ACWI emphasizes the voice channel.

other corporate insiders such as blockholders can extract private benefits of control and may not be diversified, which makes them risk averse.

Foreign institutions may be in a better position to monitor corporate insiders and influence strategic decision making than domestic institutional investors. Domestic institutions, because they are more likely to have business ties with local companies, may have less of an arm's-length relation with the firms they invest in. This suggests that domestic institutions may be more accommodative to corporate insiders and thus less effective as external monitors (Gillan and Starks (2003), Ferreira and Matos (2008)).[5] In contrast, foreign institutions are less encumbered by ties with insiders, so they can reduce managerial entrenchment and promote investment in riskier growth opportunities. Furthermore, foreign institutions may be better able to tolerate the high-risk/high-return trade-off associated with long-term investment as they can better diversify risks by holding international portfolios.[6]

There is mixed evidence on the impact of institutional investors on long-term investment in the United States. Aghion, Van Reenen, and Zingales (2013) find that institutional ownership has a positive effect on innovation in firms by mitigating managers' career concerns. Bushee (1998) finds that firms with larger institutional ownership are less likely to cut R&D in order to reverse a decline in earnings. Brav, Jiang, Ma, and Tian (2014) show that firms targeted by activists reduce R&D expenditures but experience increases in innovation output. Harford, Kecskes, and Mansi (2015) show that long-term institutional investors monitor managers and encourage firm policies that increase shareholder value and discourage overinvestment.[7]

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[5] Domestic institutional investors are often affiliated with the banks that act as creditors, underwriters, advisors or hold board seats (Ferreira and Matos (2012), Ferreira, Matos, and Pires (2015)).

[6] There are some markets that have witnessed the development of independent domestic institutions. For example, Giannetti and Laeven (2009) show that the reform of the pension system in Sweden increased investor monitoring, but only by independent private pension funds. More generally, Beck, Levine, and Loayza (2000) find a positive relation between the level of financial intermediation development and capital investments.

[7] Francis and Smith (1995) find a positive relation between institutional ownership concentration and R&D. In terms of private equity investors, Lerner, Sorensen, and Stromberg (2011) find that leveraged buyout targets do not cut innovation activities, Boucly, Sraer, and Thesmar (2011) find that leveraged buyout targets become more profitable and grow faster, and Davis, Haltiwanger, Handley, Jarmin, Lerner, and Miranda (2014) study how private equity

To test our hypotheses, we use a comprehensive data set of portfolio equity holdings by institutional investors covering over 30,000 publicly listed firms in 30 countries during the period 2001-2010. We find that a larger foreign institutional ownership leads to an increase in long-term investment (proxied by capital expenditure and R&D) and innovation output (proxied by patent counts). We also find that a larger investment in tangible and intangible capital does not induce unfriendly labor policies. On the contrary, we show that foreign institutional ownership leads to higher employment, as well as increasing other measures of human and organization capital.

The endogeneity of foreign institutional ownership makes it difficult to provide causal estimates. In fact, foreign institutions may choose to invest in firms with better long-term growth prospects or in firms for which they anticipate a surge in innovation. We address omitted variables concerns using firm fixed effects that control for time-invariant unobserved firm heterogeneity. Furthermore, we address reverse causality (and omitted variables) concerns using instrumental variable (IV) methods that isolate plausible exogenous variation in foreign institutional ownership. We exploit the fact that foreign institutions are more likely to invest in Morgan Stanley Capital International (MSCI) indices' stocks, because international portfolios are typically benchmarked against these indices (Cremers, Ferreira, Matos, and Starks (2015)). Our instrument for foreign institutional ownership is the stock additions (and deletions) to the MSCI All Country World Index (MSCI ACWI).

Our first-stage results indicate that foreign institutions increase their holdings by nearly 3 percentage points more than expected when a firm is added to the MSCI ACWI. Importantly, we find that domestic institutional ownership does not increase significantly when a firm is added to the MSCI ACWI. This result suggests that stock additions do not affect or outcomes of interest through channels (e.g., new information about firms' future prospects, investor recognition or attention, changes in capital supply) other than foreign institutional ownership, and thus supports

affects jobs and productivity. Hsu, Huang, Massa, and Zhang (2014) show that family ownership promotes innovation.

the validity of the exclusion restriction.

The second-stage results show that a 3 percentage point increase in foreign institutional ownership leads to a 0.3 percentage point increase in long-term investment (as a fraction of assets), a 12% increase in employment, and an 11% increase in innovation output. We obtain similar results when we restrict our sample to firms in the 10% bandwidth of the number of stocks around the MSCI ACWI cutoff that determines index inclusion.[8] Results are also consistent when we employ a difference-in-differences estimation around the MSCI ACWI stock addition events. We conclude that foreign institutional ownership has a positive effect on long-term investment, employment, and innovation output, which is consistent with the monitoring hypothesis.

Our evidence from stock additions suggests that indexed money managers play an active governance role and influence corporate policies. In similar work, Crane, Michenaud, and Weston (2014) and Appel, Gormley, and Keim (2015) use stock additions into the Russell indices as an identification strategy and find that passive investors (in a portfolio management sense) act as active investors (in a corporate governance sense) in the United States. In fact, Larry Fink, the Chairman of Blackrock, the world's largest (and mostly indexed) asset manager, sent a high-profile letter to chairmen/CEOs asking them to "(…) understand that corporate leaders' duty of care and loyalty is not to every investor or trader who owns their companies' shares at any moment in time, but to the company and its long-term owners."

Next, we investigate whether foreign institutions increase long-term investment and innovation output through reducing managers' career concerns in alternative to monitoring. Using investors' portfolio turnover as a measure of investment horizon (Gaspar, Massa, and Matos (2005), Harford, Kecskes, and Mansi (2015)), we first find that long-term foreign institutional ownership has a positive relation with long-term investment and innovation output. To the extent that these investors have a larger incentive to monitor, this evidence supports the

[8] The MSCI ACWI contains the largest firms and covers about 85% of the free float-adjusted market capitalization in each country.

monitoring hypothesis.

We also find a positive relation between foreign institutional ownership and long-term investment and innovation output when firms have weaker corporate governance, when country-level investor protection is weaker, and when competition in product markets is less intense (i.e., when managers are more entrenched). If corporate governance standards are weak or there is little competition, there is more need for monitoring by foreign institutions, as managers are not disciplined by mechanisms such as boards and the threat of takeover; the career concerns hypothesis predicts the reverse. Finally, we also show that the decision to terminate a CEO is more affected by poor stock market and accounting performance for firms with higher foreign institutional ownership, which again supports the monitoring channel.

Overall, our findings suggest that foreign institutions act as effective monitors by compelling corporate insiders to pursue long-term projects instead of enjoying a quiet life. The evidence differs from the career concern hypothesis that explains the role of domestic institutions in U.S. corporate innovation in Aghion, Van Reenen, and Zingales (2013). This may be due to the fact that other corporate insiders matter more in an international context, while domestic institutions represent the great majority of institutional ownership in U.S. firms.

Finally, we examine whether the presence of foreign institutions is value-enhancing. Indeed, increases in long-term investment and innovation output could be symptoms of overinvestment and "empire building" (Jensen (1986)). To this end, we conduct additional tests using several measures of firm performance. We find that foreign institutional ownership is positively associated with total factor productivity, foreign sales, and shareholder value, suggesting that foreign institutional ownership does not lead to overinvestment.

Our paper is related to the literature on the role of stock markets in promoting or distorting manager incentives to pursue short-term performance at the expense of long-term value. Stein (1988, 1989) discusses investor myopia and optimal managerial decision-making in irrational stock markets. Asker, Farre-Mensa, and Ljungqvist (2015) show that short-termism distorts investment and innovation decisions in U.S. public firms. However, Acharya and Xu (2015) find that public listing is beneficial to the innovation of firms in industries that are more dependent on external finance. Kaplan (2015) names the Internet, the fracking revolution, and the biotech booms in the last decades as evidence against the short-termist view of U.S. corporations that were part of a "failing capital investment system" (Porter (1992)). We contribute to this literature by studying the role of cross-border portfolio flows for long-term investment.

Our paper also adds to recent international studies on corporate innovation. Guadalupe, Kuzmina, and Thomas (2012) show that foreign direct investment has a positive impact on innovation in local firms through technology and know-how transfers associated with controlling stakes. Hsu, Tian, and Xu (2014) find that equity market development positively affects aggregate innovation levels. In contemporaneous work, Luong, Moshirian, Nguyen, Tian, and Zhang (2016) find that foreign institutional investors enhance innovation, but the authors do not explore the implications for long-term investment and employment. Others examine the role of different stakeholders in the innovation process, such as blockholders, creditors, and workers. Using country-level data, Acharya, Baghai, and Subramanian (2013) show that employee-friendly laws promote innovation, while Acharya and Subramanian (2009) show that creditor-friendly bankruptcy codes hinder innovation.

2. Data and Variables

Our initial sample consists of a panel of publicly listed firms in the 2001-2010 period drawn from the Worldscope database. We exclude utilities (SIC codes 4900-4999) and financial firms (SIC codes 6000-6999) because these industries tend to be regulated. We further restrict the sample to firms based in the 30 countries where publicly listed firms have, in total, at least ten patents over the sample period and $10 billion of stock market capitalization. The final sample consists of 30,952 unique firms for a total of 181,173 firm-year observations.

2.1 Long-Term Investment

In our main tests, we focus on the long-term investment in both tangible and intangible capital, which we proxy for by the sum of capital expenditures (CAPEX) and research and development expenditures (R&D). Panel A of Table 1 shows that close to $16.3 trillion was invested in fixed capital by our sample firms in 2001-2010. U.S. and non-U.S. firms have a similar average CAPEX-to-assets ratio at about 5%. Panel B of Table 1 shows that the industry (using the Fama-French 12-industry classification) with the highest capital intensity is energy, followed by telecom. Panel A of Figure 1 shows that CAPEX is well distributed around the world, and Panel A of Figure 2 shows a rise in the share of CAPEX of firms located in the Asia Pacific region during the 2000s. Figure 3 shows that seven of the top ten firms worldwide in CAPEX are energy firms as of 2010.

Our data show that R&D expenditures are well distributed across regions in the world in our sample period.[9] Panel A of Table 1 shows that close to $4.7 trillion was invested in R&D by our sample firms in 2001-2010. U.S. firms have the highest average R&D-to-assets ratio at 5.1%, which well exceeds the average of 1.5% for non-U.S. firms; we set R&D to zero for firms that do not report R&D in Worldscope. While U.S. firms lead in terms of R&D intensity, the combined R&D spending of non-U.S. firms exceeded that of U.S. firms over the sample period (see also Panel B of Figure 1). Panel B of Figure 2 shows a rise in the share of R&D expenditures of firms in the Asia Pacific region from 24% to 34% of the worldwide total during the 2000s. This suggests a globalization of innovation activity. Panel B of Figure 3 illustrates the ascendance of Toyota and Roche as the top R&D spenders in the last years of the sample period, surpassing major U.S. firms such as Ford Motor Company and Pfizer. Panel B of Table 1 shows that the industries with the highest R&D intensity are healthcare (medical equipment and drugs), followed by business equipment (computers, software, and electronic equipment), and consumer durables (cars, TVs, furniture, and household appliances).

[9] International Accounting Standard "IAS 38 Intangible Assets" defines the accounting requirements for investments in creating intangible assets such as R&D. Historically, there have been potential sample selection issues due to the voluntary nature of R&D disclosure and differences in national accounting standards. Hall and Oriani (2006) conclude that even though reporting R&D was not required in some countries in continental Europe, in fact, a fairly large share of major companies reported it. Additionally, in the second half of the 2000s, the transition by many firms to International Financial Reporting Standards (IFRS) has considerably improved R&D reporting practices.

2.2 Human and Organization Capital

Along with investment in fixed and intangible capital, firms need to make long-term investments in human and organization capital. In this regard, the notion that foreign investors act as "locusts" is that they may push for strategies adverse to local labor, such as de-localization of production or employee layoffs, as a way to boost short-term performance. To proxy for investment in human capital, we use the number of employees (*EMPLOYEES*), which has a wide coverage in Worldscope. For non-U.S. firms, we are also able to use wage-based proxies: staff costs-to-sales ratio (*STAFF_COST*), and average staff costs per employee (*AV_STAFF_COST*). While *EMPLOYEES* and *STAFF_COST* measure the level of employment and labor costs, *AV_STAFF_COST* measures the relative importance of high-skill versus low-skill jobs. To proxy for investment in organization capital (Eisfeldt and Papanikolau (2013)), we use the ratio of selling, general, and administrative expenses to sales (*SG&A*).

2.3 Innovation Output

We measure the output of R&D activity by the number of patents, the exclusive rights over the invention of a product or a process. Researchers have argued that patent counts are the most important measure of firms' innovation output (Griliches (1990)). While patent counts per se do not necessarily convey the economic value of underlying inventions, there is ample evidence of a positive relation between patents and firm value both in the United States (Hall, Jaffe, and Trajtenberg (2005)) and in Europe (Hall, Thoma, and Torrisi (2007)).

We collect information from the complete set of patent grant publications issued weekly by the U.S. Patent and Trademark Office (USPTO). In this way, we obtain the universe of utility patents awarded by the USPTO to both U.S. and non-U.S. companies, individuals, and other institutions.[10] For each patent, we identify patent assignees listed in the patent grant document, countries of these assignees, and an indicator of whether each assignee is a U.S. firm, a non-U.S.

[10] The USPTO publications are also the source for the National Bureau of Economic Research (NBER) patent database developed by Hall, Jaffe, and Trajtenberg (2001), which is commonly used by researchers.

firm, an individual, or a government entity. Using this information, we match patents to the publicly listed firms in the Worldscope database. The matching algorithm involves two main steps. First, we standardize patent assignee and firm names, focusing on unifying suffixes and removing the non-informative parts of patent assignee and firm names. Second, we apply multiple fuzzy string matching techniques to identify the firm, if any, to which each patent belongs. Using this procedure, we match 1,411,376 patents to 13,045 unique firms for patents applications in the 1990-2010 period.[11]

There are several reasons to focus on USPTO patents to measure innovation output in our international setting. First, we follow the commonly-used approach to calculate patent indicators based on information from the most important patent office, the USPTO. We choose this approach as patent regulations (with regard to the scope of patent protection) and patent office practices (governing the processing and publishing of patent applications) across different countries may not be comparable. This makes the aggregation of patent statistics difficult across different patent offices and over time.

Second, for non-U.S. firms, the patents in the sample arguably reflect more important innovations to make these firms willing to accept the costs of securing a patent in the United States. In this way, we address the common criticism that there is an excessive heterogeneity in the quality of patents. In our regressions, we include country and year fixed effects that remove a possible home advantage bias by U.S. firms, as well as any foreign country-level bias due to applying for U.S. patents.

Finally, our sample contains predominantly large firms that commonly protect their innovations by simultaneously applying for patents at the USPTO, the European Patent Office (EPO), and the Japanese Patent Office (JPO) irrespective of their domicile. The use of U.S. patents therefore does not necessarily underestimate innovation output. In robustness checks, we also examine “triadic” patents (i.e., patents applied for simultaneously at all three major

[11] In the Internet Appendix, we provide a detailed description of the matching procedure and a comparison to the NBER patent matching in terms of top U.S. firms (Table IA.1).

patenting offices − USPTO, EPO, and JPO). This alternative definition of patent counts alleviates concerns from relying on the USPTO data, and it also addresses the concern that USPTO-filed patents may be especially visible or attractive to U.S.-based institutional investors and may thus drive our results on innovation output.

We count patents as of the filling date, which is the time that is the closest to the time the innovation was created. In the ordinary least squares (OLS) regression tests, we use log(1+*PATENTS*), which is the logarithm of one plus the number of patents applied for by a firm in a given year. We assume that patent count is zero for firm-years with missing USPTO information. In robustness checks, we also weight patents by the number of future citations and use Poisson count-data models.

Panel A of Table 1 shows that our sample firms were granted a total of 686,541 patents in 2001-2010. The distribution of patents across countries illustrates the global nature of innovation. More than half of the USPTO patents are granted to non-U.S. firms. Japanese firms have the highest average patent count per year. The United States has the highest number of firms reporting patents, followed by Japan and South Korea. Although German firms are also highly active in innovation, overall, European firms filed fewer USPTO patents as a region than Asian or North American companies (see Panel C of Figure 1). Panel B of Table 1 shows that the business equipment sector accounts for over half of all patents.[12] Panel C of Figure 2 shows the geographic distribution of patents over the sample period, illustrating the large increase in the share of patents by Asian firms from 39% to 54%. Panel C of Figure 3 shows the rise of Asian firms among the list of the top ten innovator firms in the world.

[12] Some authors argue that computer, electronics, and software patents may be applied for merely to build patent portfolios for strategic reasons rather than to protect real inventions. In robustness tests, we address this concern by using patent counts adjusted by the average number of patents in each technological class and time period (Bena and Li (2014)).

2.4 Institutional Ownership

We collect institutional holdings data from the FactSet/LionShares database for the period 2000-2009.[13] The institutions in the database are professional money managers such as mutual funds, pension funds, bank trusts, and insurance companies. See Ferreira and Matos (2008) for more details on these data.

We define total institutional ownership (*IO_TOTAL*) as the sum of the holdings of all institutions in a firm's stock divided by its total market capitalization at the end of each calendar year.[14] Following Gompers and Metrick (2001) and Ferreira and Matos (2008), we set institutional ownership variables to zero if a stock is not held by any institution in FactSet/LionShares.[15] Next, we separate total institutional ownership by the nationality of the institution. Domestic institutional ownership (*IO_DOM*) is the sum of the holdings of all institutions domiciled in the same country in which the stock is listed divided by the firm's market capitalization, while foreign institutional ownership (*IO_FOR*) is the share of holdings of all institutions domiciled in a country different from the one in which the stock is listed.

Panel A of Table 1 shows that the countries with the highest average total institutional ownership as of 2009 are the United States (75%), Canada (53%), Israel (48%), and Sweden (40%). The average institutional ownership is 43% worldwide and 23% for non-U.S. firms in our sample in 2009. Even though they are, on average, minority shareholders, institutions tend to be the most influential group in terms of their share of trading (effectively being the marginal investors) and in terms of shareholder activism. In most countries, the holdings of foreign institutions exceed those of domestic institutions; the exceptions are Canada, Sweden, and the United States.

[13] Since we lag the explanatory variables by one year, our institutional ownership data span the 2000-2009 period.
[14] In calculating institutional ownership, we include ordinary shares, preferred shares, American Depositary Receipts (ADRs), Global Depositary Receipts (GDRs), and dual listings.
[15] When we repeat the analysis using only firms with positive holdings, our main results are not affected.

2.5 Firm Characteristics

We obtain firm characteristics from the Worldscope database. Table 2 shows summary statistics, and Table A.1 in the Appendix provides variable definitions and data sources. We use several firm-level control variables in our regressions. First, we control for insider ownership, which is measured by the fraction of closely held shares (*CLOSE*), including both domestic and foreign blockholders. The objectives and risk-taking incentives of blockholders are likely to be different from those of institutional investors. Second, we control for the ratio of foreign-to-total sales (*FXSALES*), as exporting firms may be more likely to innovate. We use similar variables in the employment regressions. In the innovation output regressions, we use the same firm-level controls as Aghion, Van Reenen, and Zingales (2013), namely, the logarithm of sales (*SALES*), the logarithm of capital-to-labor ratio (*K/L*), and cumulative R&D expenditures (*R&D_STOCK*). In the long-term investment regressions, we also include a measure of Tobin's Q (*TOBIN_Q*), free cash-flow-to-assets ratio (*FCF*), debt-to-assets ratio (*LEVERAGE*), cash holdings-to-assets ratio (*CASH*), and net property, plant, and equipment-to-assets ratio (*PPE*). We winsorize all firm-level variables at the bottom and top 1% levels.

3. Results

3.1 Identification Strategy

We begin our analysis using ordinary least squares (OLS) regressions. However, there is a plausible concern that these regressions may suffer from endogenous selection bias. Skilled foreign institutional investors may invest in firms (on the basis of characteristics that are unobservable to us) with better growth prospects or anticipate a surge in innovation, which could explain the positive association between foreign institutional ownership and long-term investment or innovation output. To address this issue, we run our regressions with firm fixed effects that account for unobserved firm heterogeneity and remove potential bias due to time-invariant firm-level omitted variables.

We also implement an instrumental variables (IV) approach using a two-stage least squares (2SLS) regression. Following Aggarwal, Erel, Ferreira, and Matos (2011), we use the inclusion of a firm in the MSCI All Country World Index (MSCI ACWI) as an instrument for foreign institutional ownership, which addresses reverse causality and measurement error concerns, in addition to omitted variables bias. The MSCI ACWI captures large and mid-cap equities across 23 developed markets and 23 emerging markets countries so it encompasses all of the MSCI indices that are the most commonly used benchmarks by foreign portfolio investors (e.g., MSCI World, MSCI Emerging Markets).[16] We exploit the exogenous variation in foreign institutional ownership around the threshold that determines the inclusion of a stock in the index. The index methodology follows the rule that the coverage is about 85% of the free float-adjusted market capitalization in each country (MSCI (2015)). Specifically, stocks are included in the index in descending order of their free float-adjusted market capitalization until the cumulative share of firms included in the index reaches 85% of the free float-adjusted market capitalization in each country. Because index membership is determined by the arbitrary rule that firms are included depending on their market capitalization ranking, the variation in foreign institutional ownership induced by this rule is plausibly exogenous.

The importance of index membership for ownership by foreign institutional investors is illustrated in Figure 4 as of 2009 (the final year of our sample period). We sort stocks using their end-of-year free float-adjusted market capitalization in each country and plot the average foreign institutional ownership (*IO_FOR*) versus the average cumulative share of firms in the MSCI ACWI. Figure 4 shows a discontinuity in *IO_FOR* around the 85% threshold of the cumulative share of firms in the MSCI ACWI.

[16]As of 2015, MSCI ACWI had 2,480 constituents and the index covered approximately 85% of the global investable equity opportunity set. Cremers, Ferreira, Matos, and Starks (2015) show that the MSCI indices are the most followed by open-end mutual funds around the world. For example, the *Financial Times* (2015) reports that these benchmarks are currently tracked by funds worth $1.7 trillion and that the potential addition of China A-shares to the MSCI indices might cause significant rebalancing of institutional investors' portfolios. In the U.S. context, a number of authors take the stock membership in the S&P 500 index (e.g., Aghion, Van Reenen, and Zingales (2013), Cella (2014)) or the discontinuity in the Russell 1,000/2,000 indices (e.g., Appel, Gormley, and Keim (2015)) as an exogenous shock to institutional ownership.

Our IV estimation relies on the assumption that inclusion in the MSCI ACWI is associated with an increase in *IO_FOR* (relevance condition), but does not directly affect our outcomes of interest except through its impact on ownership by foreign institutions (exclusion restriction). We verify the relevance condition below in the first stage estimations, and the exclusion restriction seems reasonable as it is unclear why index inclusion would be directly related to our outcomes of interest (after controlling for the factors that determine index membership). In fact, the exclusion restriction assumption is likely to be satisfied as stocks are added to the MSCI ACWI because they represent a country's investable equities, not because of their expected performance or firm investment policy.

We also estimate reduced-form regressions using the instrumental variable (*MSCI*) as the explanatory variable to check the validity of our identification strategy. Table IA.2 in the Internet Appendix reports the results for long-term investment, employment, and innovation output. The coefficients on *MSCI* are positive and statistically significant in all specifications, which indicates that our identification strategy is supported by the data.

3.2 First-Stage Results

Table 3 presents the results of the first-stage regression of the IV estimator. The instrument is a dummy variable (*MSCI*) that equals one if a firm is included in the MSCI ACWI in a given year, and zero otherwise. The first-stage tests whether the instrument is correlated with foreign institutional ownership. Column (1) presents the results of the specification including country, industry, and year fixed effects, and column (2) presents the results using firm and year fixed effects. In the firm fixed effects specification, the result is driven by within-firm changes in the *MSCI* dummy variable, that is, by the stock additions to or deletions from the MSCI ACWI. The coefficient on the *MSCI* instrument is positive and statistically significant in both cases. In column (1), the *MSCI* coefficient is 0.063, with an F-statistic of 331. In column (2), the *MSCI* coefficient is 0.029, with an F-statistic of 353. The F-statistics are well above the conventional threshold, confirming that the instrument provides explanatory power for the variation in foreign institutional ownership. Using the estimate in column (2), foreign institutions hold about 3 percentage points more of market capitalization in firms that are included in the MSCI ACWI.

As a placebo test, we also run a first-stage regression of domestic institutional ownership on the instrument (*MSCI*). Columns (3) and (4) of Table 3 show the results. The coefficient on *MSCI* is *negative* and statistically significant in column (3), and statistically insignificant in column (4) when we include firm fixed effects in the regression. Since domestic institutions do not increase (decrease) their holdings following stock additions (deletions) to the MSCI ACWI, this result suggests that these index re-composition events do not reveal new information to institutional investors about the firms' future growth prospects (Denis, McConnell, Ovtchinnikov, and Yu (2003)). This result also does not support other channels such as investor recognition and attention and changes in capital supply, and thus lends further support to the validity of the exclusion restriction.

3.3 Second-Stage Results

Tables 4-6 present our baseline results of the long-term effects of foreign institutional ownership. Our main outcome variables are: (1) long-term investment (proxied by the ratio of CAPEX plus R&D expenditure-to-assets); (2) human capital (proxied by employment); (3) innovation output (proxied by patent counts). We report the results of the OLS specifications and second-stage specifications of the IV estimator. The regressions control for domestic institutional ownership (*IO_DOM*), insider ownership (*CLOSE*), and other firm characteristics that may also affect the outcome variables. The regressions also include country, industry, and year fixed effects, or firm and year fixed effects.

Table 4 presents the results of the effect of foreign institutional ownership on long-term investment (*CAPEX+R&D*). Columns (1) and (2) present the OLS specification results. The coefficients on foreign institutional ownership (*IO_FOR*) are positive and statistically significant, and range from 0.022 to 0.041. The results show a positive relation between foreign institutional ownership and long-term investment.

Columns (3) and (4) of Table 4 present IV estimates using *MSCI* as an instrument for foreign institutional ownership. The coefficients are positive and statistically significant in both columns, and range from 0.094 to 0.108. A 3 percentage point increase in foreign institutional ownership leads to an increase of about 0.3 percentage points in long-term investment using the firm fixed effects estimate (column (4)). Interestingly, the coefficients on foreign institutional ownership from the IV specification are larger than those reported in columns (1) and (2) from the OLS specification. The OLS bias towards zero could be due to foreign institutions selecting firms that are currently underinvesting (but may increase investment in the future) or due to attenuation bias related to measurement error in the explanatory variable of interest.[17]

Table 5 reports the results for human capital as proxied by the logarithm of the number of employees (*EMPLOYEES*). The OLS coefficient estimates on foreign institutional ownership are positive and statistically significant indicating a positive association between foreign institutional ownership and employment. The IV coefficients on foreign institutional ownership are also positive and statistically significant. A 3 percentage point increase in foreign institutional ownership leads to an increase of about 12% in the number of employees using the firm fixed effects estimate (column (4)).

Table 6 presents the results of the effect of foreign institutional ownership on innovation output as proxied by the logarithm of one plus the number of patents (*PATENTS*). The OLS coefficient estimates on foreign institutional ownership are positive and statistically significant. The results show a positive association between foreign institutional ownership and innovation output. The IV coefficient estimates on foreign institutional ownership are positive and statistically significant. A 3 percentage point increase in foreign institutional ownership leads to an increase of about 11% in patent counts using the firm fixed effects estimate (column (4)).[18] Similar to Tables 4 and 5 on long-term investment and employment, the estimates of the effect of

[17] In fact, foreign institutional ownership might be noisy due to differences in mandatory portfolio holdings disclosure rules across countries, as well as recording and classification mistakes.

[18] In untabulated results, we find that our results are unchanged when we include firm fixed effects determined using the pre-sample mean scaling method proposed by Blundell, Griffith, and Van Reenen (1999).

foreign institutional ownership are larger in the IV specification than in the OLS specification. The results suggest that the OLS specification underestimates the positive effect of foreign institutional ownership on innovation output by treating institutional ownership as exogenous. Aghion, Van Reenen, and Zingales (2013) also find a negative selection bias indicating that OLS regressions underestimate the positive effect of institutional ownership on innovation for U.S. firms.

Our IV results suggest that (foreign) indexed money managers influence corporate policies. Appel, Gormley, and Keim (2015) also suggest that quasi-indexed investors increasingly play an active role in corporate governance in the United States. Following Appel, Gormley, and Keim (2015), we repeat our IV estimation using a sample restricted to firms in the 10% bandwidth of the number of stocks around the MSCI ACWI cutoff that determines index inclusion where membership is likely to be random. The MSCI ACWI cutoff point is the (free float-adjusted) market capitalization ranking of the first stock after which the index coverage is at least 85% of the free float-adjusted market capitalization in each country. Table 7 shows that the IV results are similar to those in Tables 3-6 when we use the 10% bandwidth.

3.4 Quasi-Natural Experiment: Stock Additions to the MSCI Index

To further validate a causal effect of foreign institutional ownership (and the quality of our instrument), we perform a quasi-natural experiment using additions of stocks to the MSCI ACWI. In this approach, we employ a difference-in-differences regression around the period a stock is added to the MSCI ACWI (treated firms). We use a two-year event window surrounding each stock addition and identify 574 additions to the index. We select control firms using propensity score matching with replacement that best matches each firm in the treatment group (the nearest neighbor) on multiple lagged (two years before the event) covariates (*CAPEX+R&D*, log(1+*PATENTS*), *CLOSE*, *FXSALES*, log(*SALES*), log(*R&D_STOCK*), log(*K/L*), and *IO_FOR*), and country and industry fixed effects. Panel A of Table 8 reports results of the tests of equality of means and medians between the treatment and control groups.

In general, we cannot reject the hypothesis of equal means or medians between the treatment and control groups.

Panel B of Table 8 presents difference-in-differences regression results obtained using the treatment-control sample and firm fixed effect specifications. In these tests, the explanatory variable of interest is the interaction of the *TREATED* dummy variable (which takes a value of one if a firm is added to the MSCI ACWI) with the *AFTER* dummy variable (which takes a value of one in the year a firm is added to the MSCI ACWI and thereafter). The interaction term coefficient captures the differential effect between the treatment and control groups following a stock addition to the MSCI ACWI.

Column (1) of Table 8 shows that foreign institutional ownership increases significantly by 2 percentage points of market capitalization after a firm in the treatment group is added to the MSCI ACWI relative to control firms. The results in column (2) show that the differential effect on domestic institutional ownership is close to zero and statistically insignificant, which supports the exclusion restriction.[19] We also find that firms in the treatment group increase long-term investment, employment, and innovation output (columns (3)-(5)) in the post-treatment period relative to control firms. These results are both statistically and economically significant. The firms in the treatment group experience a 0.5 percentage point increase in long-term investment, a 14.3% increase in employment, and a 5.4% increase in innovation output following the addition of their stocks to the MSCI ACWI. These results are qualitatively similar to those obtained using the IV approach in Tables 4-6.

Figure 5 shows the evolution of the differences in foreign and domestic institutional ownership between the treatment and control groups in the two years before and after a firm is added to the MSCI ACWI, based on estimates in which the treatment variable is interacted with indicators for event years. The index additions occur between year -1 and year 0. Importantly,

[19] This result suggests that foreign institutions are not buying their shares from domestic institutions. In unreported tests, we find that there is a statistically significant decrease in closely-held shares, which suggests that insiders (and potentially also retail investors) are the primary sellers of shares after MSCI ACWI additions.

the figure shows that the two groups follow parallel trends in the pre-treatment period. Panel A shows that *IO_FOR* increases significantly after a firm has been added to the MSCI ACWI. Panel B shows that there is no such pattern for *IO_DOM*, which alleviates concerns that the addition of a firm in the MSCI ACWI is driven by good news about the firm, since such news would drive all institutional investors to increase their stock holdings. Using the same methodology, Figure 6 shows a positive differential effect in long-term investment, employment, and innovation output after a firm has been added to the MSCI ACWI.

We also perform a quasi-natural experiment using deletions of stocks from the MSCI ACWI. Table IA.3 in the Internet Appendix shows a negative differential effect in long-term investment, employment, and innovation after a firm has been deleted from the MSCI ACWI. The coefficient on long-term investment is negative but statistically insignificant. The lack of precision is likely due to a smaller number of firms deleted from the MSCI ACWI (167 firms) relative to the number of firms added to the index (574 firms). In short, we find the opposite results using deletions, which provides further support for the validity of the instrument.

3.5 Monitoring versus the Career Concerns Channel

Our findings of a positive effect of foreign institutional ownership on long-term investment, employment, and innovation output are consistent with the idea that foreign institutions reduce managerial entrenchment by monitoring managers otherwise enjoying a "quiet" life (Bertrand and Mullainathan (2003)) or insider blockholders that extract private benefits of control. Monitoring refers to influencing management directly (by voice) or indirectly by selling their shares (exit or voting with their feet). The alternative channel is that foreign institutional involvement alleviates managers' career concerns and risks and increases tolerance for failure (Manso (2011)).

We first examine whether our effect is driven by foreign investors with a longer or shorter horizon. Short-term foreign investors have fewer incentives to monitor and are not likely to motivate corporate managers to invest, but rather to focus on short-term earnings goals. For example, the Kay Review (2012) in the U.K. argues that R&D expenditures by British businesses has been in steady decline and that the short-term incentives of asset managers have been pushed down to corporate managers. Following Gaspar, Massa, and Matos (2005) and Harford, Kecskes and Mansi (2015), we measure shareholder horizons using investors' portfolio turnover (value-weighted average). We then define *IO_FOR_LT* as the ownership by long-term foreign institutional investors, that is, those who have a portfolio turnover rate below the median. Similarly, *IO_FOR_ST* is ownership by short-term foreign institutional investors, that is, those who have a portfolio turnover rate above the median.

Table 9 reports the results. We run an OLS regression of *CAPEX+R&D* (column (1)), *EMPLOYEES* (column (2)), and *PATENTS* (column (3)), and find a positive effect of long-term foreign institutional ownership (*IO_FOR_LT*) and short-term foreign institutional ownership (*IO_FOR_ST*). However, the magnitude of the effect is more pronounced for *IO_FOR_LT*, which is consistent with the monitoring hypothesis.

Second, we examine whether the benefits of foreign institutional ownership are felt more strongly when managers are entrenched. If instead, the career concern channel dominates, the impact of institutional ownership should be weaker when managers are entrenched. We measure managerial entrenchment using a firm-level index consisting of 41 governance attributes defined by Aggarwal, Erel, Stulz, and Williamson (2009) and Aggarwal, Erel, Ferreira, and Matos (2011). The *GOV* index provides a firm-level governance measure that is comparable across countries and incorporates information on board structure, anti-takeover provisions, auditors, compensation, and ownership structure. The index is constructed using data obtained from RiskMetrics/Institutional Shareholder Services.[20]

Columns (1), (4), and (7) of Table 10 report the results. The regression includes as main explanatory variables foreign institutional ownership (*IO_FOR*), the governance index (*GOV*),

[20] *GOV* is similar in spirit to the governance index of Gompers, Ishii, and Metrick (2003), but the scale is reversed (a higher *GOV* means more shareholder-friendly governance practices).

and the interaction *IO_FOR* × *GOV*.[21] We find that foreign institutional ownership positively affects long-term investment, employment, and innovation output controlling for corporate governance. The positive association is stronger under weaker corporate governance, as indicated by the negative and significant coefficient on the interaction variable *GOV* × *IO_FOR*. We conclude that the effect of foreign institutional ownership is more pronounced when managers are more entrenched. These findings are thus consistent with the monitoring channel, and contrary to the career concerns channel.

Third, we examine at country-level measures of investor protection. We use the anti-self-dealing index (*ANTI_SD*) of Djankov, La Porta, Lopez-de-Silanes, Shleifer (2008)), which measures the legal protection of minority shareholders against expropriation by corporate insiders. Columns (2), (5) and (8) of Table 10 show a negative and significant coefficient on the interaction variable *ANTI_SD* × *IO_FOR*, which indicates that the effect of foreign institutional investors is more pronounced in countries where the problem of investor expropriation is more acute. The findings are again consistent with the monitoring hypothesis.

A final test exploits the fact that the two channels differ in the interaction between foreign institutional ownership and product market competition. In the monitoring channel, competition and institutional ownership are substitutes. Specifically, in highly competitive environments there should be little managerial slack and therefore little need for monitoring by institutions or other mechanisms. In contrast, in the career concern channel, the two are complements, that is, the positive effect of foreign institutions on innovation should be stronger when competition is higher. Following Aghion, Van Reenen, and Zingales (2013), we measure *COMPETITION* as one minus the Lerner index for a given three-digit SIC industry.[22] In columns (3), (6), and (9) of Table 10, we find that the *IO_FOR* coefficient remains positive even after controlling for *COMPETITION*. In column (6), we find that the *COMPETITION* × *IO_FOR* coefficient is

[21] The sample of firms in these tests is significantly smaller because of sparser coverage of the *GOV* measure, which is limited to the largest market capitalization firms in each country.
[22] We obtain similar results when we use the Lerner index in a given country-industry or country-industry-year.

negative and significant, which indicates a more pronounced effect of foreign institutional ownership on innovation output in less competitive industries (the interaction variable coefficient is insignificant in the case of long-term investment and employment in columns (3) and (9)). This finding is again consistent with the monitoring channel.

An alternative test of the monitoring versus career concerns channel is to examine whether foreign institutions affect the sensitivity of CEO turnover to (poor) performance. The prediction is that higher foreign institutional ownership increases the ability of a firm's board of directors to identify and terminate poorly performing CEOs. In the career concern hypothesis, CEO turnover is less sensitive to performance in the presence of higher foreign institutional ownership.

Following Aggarwal, Erel, Ferreira, and Matos (2011), we classify a firm as having experienced a CEO turnover using the BoardEx database.[23] We use a probit regression model of CEO turnover on lagged firm (market or accounting) performance and foreign institutional ownership (*IO_FOR*). We use both abnormal stock returns (*RETURN*) and change in return on assets (ΔROA). The explanatory variable of interest is the interaction of performance and foreign institutional ownership ($RETURN \times IO\_FOR$ or $\Delta ROA \times IO\_FOR$).

Table 11 presents the results of the CEO turnover analysis. The results show that CEO turnover is more sensitive to low abnormal stock returns in firms with higher foreign institutional ownership. The estimated mean of interaction effects (reported at the bottom of the table) are negative and statistically significant.[24] These results indicate that firms with higher foreign institutional ownership are more likely to replace poorly performing CEOs. This suggests that foreign institutions act as monitors, forcing managers to exert effort and invest instead of enjoying a quiet life. We conclude that monitoring by foreign institutional investors is likely the

[23] We cannot distinguish between voluntary and forced turnovers, but this distinction just leads to additional noise in the dependent variable, because voluntary turnovers are unlikely to be related to performance (Hermalin and Weisbach (2003)).

[24] Ai and Norton (2003) show that we cannot draw conclusions about the sign and the significance of the interaction term in nonlinear models (such as probit models) by examining the coefficient on the interaction term. To ensure that we draw valid inferences on the interaction variable effect, we estimate the marginal effect of the interaction variable and its significance using the delta method described by Ai and Norton (2003).

channel through which managers are more willing to invest in long-term firm growth.

These results contrast with those reported by Aghion, Van Reenen, and Zingales (2013), who find that the careers concerns channel explains the relation between *domestic institutional ownership* and innovation output in U.S. firms. They find that the effect of domestic institutional ownership on innovation is more pronounced when CEOs are less entrenched and when competition is lower. In addition, they find that firms with greater domestic institutional ownership are less likely to fire their CEOs when performance is poor. In untabulated results, we replicate their findings using domestic institutional ownership in the sample of U.S. firms and in our worldwide sample of firms. We conclude that foreign and domestic institutional investors differ in the way they provide incentives for managers and other corporate insiders to make long-term investments and exploit innovative growth opportunities. Domestic institutional investors appear to tolerate failure, while foreign institutional investors seem to engage in activism.

3.6 Human Capital

We perform additional tests on the effects of foreign institutional ownership on human capital. We show that foreign institutional ownership has a positive impact on firm-level employment (see Table 5), but this may be at a cost of lower salaries or an increase in the relative importance of low-skill versus high-skill jobs. We address these questions by examining the effect of foreign institutional ownership on salaries as a fraction of sales (*STAFF_COST*) and average salary per employee (*AV_STAFF_COST*). These two variables are available only for non-U.S. firms since there is no disclosure of this information by U.S. firms. We also examine the effect of foreign institutional ownership on organization capital, which is an input that is distinct from physical capital. Eisfeldt and Papanikolau (2013) show that shareholders investing in firms with high organization capital are exposed to additional risks, and therefore demand higher risk premia. Following these authors, we proxy for investment in organization capital using the ratio of selling, general, and administrative expenses-to-sales (*SG&A*).

Table 12 shows the results for the proxies of investment in human capital using OLS (columns (1) and (2)) and IV regressions (columns (3) and (4)). We find a positive effect of foreign institutional ownership on human capital and organization capital. The effects are also economically significant. A 3 percentage point increase in foreign institutional ownership leads to an increase of 3.9 percentage point in the ratio of staff costs-to-sales, and an increase of 3.6% in the average salary using the IV specification in column (4) of Panels A and B. The magnitude of the effect is particularly strong in the case of organization capital as a 3 percentage point increase in foreign institutional ownership leads to an increase of about 5.7 percentage points in the ratio of SG&A-to-sales, as shown in column (4) of Panel C.

3.7 Productivity and Performance

So far, our evidence supports the view that foreign institutional investors foster long-term investments in tangible, intangible, and human capital, leading to higher innovation output. However, not all investment and innovative activities necessarily enhance firm value. To examine this issue, we conduct additional tests using several measures of firm productivity and performance. Table 13 presents the results using both OLS and IV regressions.

We first ask whether foreign institutional ownership increases total factor productivity. We run a regression of the logarithm of total sales (*SALES*) on foreign institutional ownership (*IO_FOR*) with controls for the logarithm of capital (*K*) and logarithm of labor (*L*). Panel A of Table 13 shows that the *IO_FOR* coefficient is positive and statistically significant, which indicates that foreign institutional ownership is associated with increases in productivity. A 3 percentage point increase in foreign institutional ownership leads to a 5.8% increase in total sales using the IV specification in column (4).[25]

The second measure is foreign operations. In Panel B of Table 13, we examine whether foreign institutional ownership leads to the growth in products and services that can be marketed internationally. We use foreign sales as a fraction of total sales (*FXSALES*) as the dependent

[25] In untabulated results, we obtain qualitatively similar results if we use the logarithm of sales per employee as a dependent variable.

variable. We find that foreign institutional ownership increases the internationalization of firm operations, as indicated by the positive and significant coefficient on *IO_FOR*. A 3 percentage point increase in foreign institutional ownership leads to an increase of 1.3 percentage points in the fraction of foreign sales using the IV specification in column (4).

Our third measure is firm valuation. We estimate a regression in which Tobin's Q (*TOBIN_Q*) is the dependent variable. Panel C of Table 13 shows that foreign institutional ownership increases firm valuation. A 3 percentage point increase in foreign institutional ownership leads to an increase of about 0.12 in Tobin's Q using the IV specification in column (4). Thus, we find evidence that foreign institutional investor monitoring increases firm value.[26]

3.8 Robustness

We perform several robustness tests. We start by testing for alternative channels. We first examine whether financial constraints explain our findings. We measure financial constraints using the Kaplan-Zingales index (*KZ_INDEX*). Table IA.4 in the Internet Appendix shows that the impact of foreign institutional ownership is stronger in firms that are less likely to be financially constrained. We then test whether asymmetric information, proxied by stock illiquidity measure of Amihud (2005), explains our findings. Table IA.4 also shows that the impact of foreign institutional ownership is stronger in less illiquid stocks, which are less likely to be subject to information asymmetry. We conclude that our findings are not explained by the financial constraints and information asymmetry channels.

We next assess the sensitivity of our results when we restrict the sample to non-U.S. firms. Table IA.5 in the Internet Appendix shows that our main findings are qualitatively similar when we restrict the sample to non-U.S. firms.

[26] In untabulated results, we estimate a regression where the dependent variable is *TOBIN_Q* and the main explanatory variable is log(1 + *PATENTS*). The coefficient on this variable is positive and significant, indicating that a higher innovation productivity is positively valued by capital markets. This is consistent with findings on the market value of patent citations by Hall, Jaffe, and Trajtenberg (2005) for U.S. firms and Hall, Thoma, and Torrisi (2007) for European firms.

We also perform several robustness tests on our long-term investment results. In Table IA.6 in the Internet Appendix, we find similar results for foreign institutional ownership in the following cases: (1) the sample is restricted to the 2005-2010 post-IFRS adoption period when R&D disclosure is harmonized in firms worldwide; (2) we control for country-by-industry-by-year fixed effects to capture any country-specific and industry-specific time trends; (3) we scale CAPEX plus R&D expenditures by sales (instead of assets, as in our main tests); and (4) and (5) we split long-term investment into its individual components (i.e., CAPEX and R&D are separate dependent variables).

We also perform several robustness checks on our innovation output results. The results are in Table IA.7 in the Internet Appendix. First, we restrict the sample to firms with at least one patent in the 2001-2008 period. We exclude the final two years of the sample period to address truncation bias concerns because patents can be granted multiple years after their applications are filed. Second, we check the sensitivity of our results when we include country-by-industry-by-year fixed effects. Third, we consider alternative proxies for innovation output. Since patents may take several years to develop, we use patent counts computed over a three-year rolling window, as well as patents counts three years in the future. We also use patent counts scaled by technological class and time period (Bena and Li (2014)), and the ratio of patent counts-to-R&D stock (i.e., patent counts per a measure of input into the innovation process).[27] Since the quality and value of patents may differ, we also consider patent counts weighted by future citations and "triadic" patents (i.e., patents filed simultaneously with all three major patent offices − USPTO, EPO, and JPO). Finally, we use count-based models such as a Poisson regression as alternatives to the OLS model (Hall, Jaffe, and Trajtenberg (2001)). The findings in all these robustness tests confirm our baseline results that the presence of foreign institutional investors is associated with more innovation.

[27] Patent counts in different technology classes may not be directly comparable. In addition, large increases in the number of awarded patents in some technology classes over time might reflect the evolution of the USPTO practices with respect to what is a patentable invention, so patent counts from different time periods may not be time-consistent measures of innovation productivity even within the same technology class.

4. Conclusion

We study the long-term effects of foreign institutional ownership using firm-level data from 30 countries over the 2001-2010 period. We identify the effects by exploiting the exogenous increase in foreign institutional ownership that follows the addition of a stock to the MSCI indices. We find that higher foreign institutional ownership leads to more long-term investment in tangible, intangible, and human capital. Foreign institutional ownership also leads to significant increases in innovation output, as well as internationalization of a firm's operations and shareholder value. We show that these effects are explained by the disciplinary and monitoring roles of foreign institutions.

Our results help dismiss popular fears that portray foreign investors as predominantly interested in short-term gains, often at the expense of long-term investment and employment. We conclude that the globalization of a firm's shareholder base is a positive force for capital formation and helps make firms more competitive. There are also wider policy implications, as the use of scarce corporate resources in long-term investment and innovation activities has important benefits. Our results do not support economic nationalism aimed at protecting "national champions" from predatory foreign capital. Instead, our findings suggest that openness to international portfolio investment may generate positive externalities for the real economy by helping to create jobs, as well as facilitating the development of new technologies, products, and services.

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Table 1
Institutional Ownership, Long-Term Investment, and Innovation by Country and Industry

This table shows the number of publicly-listed firms and statistics of foreign and domestic institutional ownership (as a fraction of market capitalization), capital expenditures-to-assets ratio, R&D-to-assets ratio, and patent counts by country (Panel A) and industry (Panel B). The sample consists of Worldscope non-financial and non-utility firms in the 2001-2010 period. Variable definitions are provided in Table A.1 in the Appendix.

Panel A: Statistics by Country

			Capital Expenditures		R&D Expenditures		Patent Count		Institutional Ownership	
Region	Country	Firms	Total ($bln) 2001-2010	Mean CAPEX/ Assets	R&D ($ bln) 2001-2010	Mean R&D/ Assets	Total 2001-2010	Mean Patent Count	Foreign IO 2009	Domestic IO 2009
North America	United States	8,657	4,702.1	0.050	1,873.5	0.051	298,200	6.17	0.08	0.67
	Canada	1,311	610.2	0.085	40.5	0.034	5,957	1.15	0.26	0.27
Europe	Germany	919	1,045.8	0.050	410.5	0.022	29,484	4.90	0.23	0.06
	France	977	900.6	0.046	235.2	0.015	8,767	1.41	0.19	0.08
	Netherlands	192	224.6	0.051	100.7	0.014	7,893	5.97	0.34	0.03
	Switzerland	224	193.3	0.044	194.8	0.028	5,759	3.55	0.25	0.04
	Finland	145	77.0	0.055	63.5	0.034	5,347	4.66	0.26	0.09
	Sweden	499	131.9	0.037	76.7	0.024	4,407	1.50	0.14	0.26
	United Kingdom	2,199	1,107.8	0.047	201.3	0.026	2,476	0.20	0.20	0.13
	Denmark	160	98.6	0.058	22.4	0.026	1,343	1.24	0.21	0.07
	Belgium	135	84.3	0.058	19.4	0.019	875	0.99	0.18	0.01
	Italy	269	341.7	0.042	53.1	0.006	751	0.41	0.18	0.02
	Norway	259	179.3	0.074	7.9	0.013	304	0.22	0.13	0.10
	Austria	107	62.2	0.067	4.9	0.021	231	0.36	0.20	0.02
	Ireland	84	34.6	0.049	5.1	0.017	12	0.03	0.39	0.01
	Spain	148	309.3	0.049	3.4	0.003	42	0.04	0.18	0.02
	Hungary	40	18.6	0.082	1.0	0.007	53	0.23	0.23	0.01
Asia Pacific	Japan	4,152	2,673.3	0.036	1,143.5	0.013	212,034	6.56	0.09	0.04
	South Korea	1,691	676.1	0.053	77.9	0.009	56,020	5.81	0.14	0.00
	Taiwan	1,573	337.1	0.050	74.7	0.025	41,147	4.29	0.15	0.02
	India	1,121	250.9	0.081	9.5	0.003	1,869	0.45	0.08	0.03
	Singapore	534	67.4	0.048	2.9	0.002	1,289	0.58	0.13	0.02
	China	1,904	950.6	0.062	32.2	0.002	752	0.07	0.09	0.06
	Australia	1,049	284.5	0.067	7.4	0.016	372	0.08	0.17	0.02
	Hong Kong	857	365.0	0.043	8.7	0.005	32	0.01	0.11	0.03
	New Zealand	49	10.7	0.070	0.2	0.006	77	0.39	0.12	0.03
	Malaysia	898	53.2	0.044	1.3	0.001	14	0.00	0.06	0.01
Other	Israel	298	25.1	0.035	12.3	0.050	825	0.62	0.47	0.01
	Brazil	205	343.9	0.065	9.0	0.001	192	0.21	0.24	0.03
	South Africa	296	117.8	0.067	2.1	0.003	17	0.01	0.20	0.04
	Non-U.S.	22,295	11,575.4	0.050	2,822.0	0.015	388,341	2.92	0.16	0.07
	All Countries	30,952	16,277.5	0.050	4,695.5	0.024	686,541	3.79	0.13	0.30

Table 1 (continued)

Panel B: Statistics by Industry

Region	Industry	Firms	Capital Expenditures Total ($ bln) 2001-2010	Capital Expenditures Mean CAPEX/ Assets	R&D Expenditures Total ($ bln) 2001-2010	R&D Expenditures Mean R&D/ Assets	Patent Count Total 2001-2010	Patent Count Mean Patent Count
Non-U.S.	1: Consumer Non-Durables	2,244	529.4	0.046	97.2	0.005	5,065	0.36
Firms	2: Consumer Durables	1,013	1,645.2	0.056	733.9	0.016	112,615	17.15
	3: Manufacturing	3,838	1,485.5	0.049	471.8	0.010	61,245	2.55
	4: Energy	831	1,860.1	0.129	46.0	0.002	762	0.22
	5: Chemicals and Allied Products	952	399.2	0.055	158.8	0.013	21,010	3.37
	6: Business Equipment	4,315	775.7	0.043	606.4	0.036	165,387	6.60
	7: Telecom	509	1,506.6	0.066	87.9	0.007	3,781	1.35
	9: Shops	2,622	1,031.8	0.042	40.6	0.002	2,614	0.16
	10: Healthcare	1,105	269.1	0.047	511.4	0.047	13,980	2.20
	12: Other	4,866	2,072.9	0.050	67.8	0.007	1,882	0.07
U.S.	1: Consumer Non-Durables	474	204.5	0.040	28.5	0.009	2,664	0.99
Firms	2: Consumer Durables	209	134.1	0.044	126.7	0.034	11,272	8.98
	3: Manufacturing	832	323.9	0.042	186.7	0.025	32,846	6.34
	4: Energy	472	1,153.1	0.155	25.2	0.004	580	0.23
	5: Chemicals and Allied Products	215	141.3	0.041	85.8	0.035	4,795	3.73
	6: Business Equipment	2,306	451.8	0.035	840.3	0.099	214,557	16.85
	7: Telecom	395	650.0	0.067	9.2	0.019	2,521	1.32
	9: Shops	954	592.9	0.057	16.6	0.005	1,073	0.20
	10: Healthcare	1,128	267.0	0.036	524.0	0.109	24,330	3.64
	12: Other	1,672	783.5	0.052	30.6	0.019	3,562	0.41
All	1: Consumer Non-Durables	2,718	733.9	0.046	125.6	0.006	7,729	0.47
Firms	2: Consumer Durables	1,222	1,779.3	0.054	860.7	0.019	123,887	15.84
	3: Manufacturing	4,670	1,809.5	0.048	658.5	0.012	94,091	3.23
	4: Energy	1,303	3,013.1	0.140	71.1	0.002	1,342	0.22
	5: Chemicals and Allied Products	1,167	540.5	0.053	244.6	0.016	25,805	3.43
	6: Business Equipment	6,621	1,227.4	0.040	1,446.7	0.058	379,944	10.05
	7: Telecom	904	2,156.6	0.067	97.2	0.012	6,302	1.34
	9: Shops	3,576	1,624.7	0.046	57.2	0.003	3,687	0.17
	10: Healthcare	2,233	536.1	0.041	1,035.4	0.079	38,310	2.94
	12: Other	6,538	2,856.4	0.050	98.4	0.010	5,444	0.15

Table 2
Summary Statistics

This table shows mean, median, standard deviation, minimum, maximum, and the number of observations for each variable. Variable definitions are provided in Table A.1 in the Appendix. The sample consists of Worldscope non-financial and non-utility firms in the 2001-2010 period. Variables are winsorized at the top and bottom 1%.

	Mean	Median	Standard Deviation	Minimum	Maximum	Number of Observations
CAPEX+R&D	0.071	0.043	0.085	0	0.798	181,173
EMPLOYEES	4,133	650	10,888	1	70,700	166,305
PATENTS	1.280	0	5.809	0	43	181,173
SALES ($ million)	941	120	2,740	0.001	18,341	181,173
FXSALES	0.157	0	0.272	0	0.954	181,173
TOBIN_Q	2.120	1.243	4.451	0.413	60.589	171,432
STAFF_COST	0.342	0.185	0.858	0.001	9.238	73,259
AV_STAFF_COST ($ thousands)	45	36	43	0	328	70,274
SG&A	0.440	0.201	0.850	0.026	4.956	144,800
IO_TOTAL	0.153	0.021	0.259	0	1	181,173
IO_FOR	0.027	0.001	0.067	0	1	181,173
IO_DOM	0.126	0.004	0.246	0	1	181,173
IO_FOR_LT	0.018	0	0.048	0	1	181,173
IO_FOR_ST	0.009	0	0.029	0	1	181,173
CLOSE	0.287	0.242	0.275	0	0.913	181,173
K/L	192	41	790	0	9,959	181,173
R&D_STOCK ($ millions)	30	0	92	0	490	181,173
FCF	-0.132	0.015	0.729	-7.818	0.344	179,360
LEVERAGE	0.257	0.194	0.346	0	3.219	181,046
CASH	0.180	0.116	0.189	0	0.989	180,998
PPE	0.284	0.240	0.222	0	0.948	181,166
GOV	0.537	0.537	0.128	0.220	0.927	37,061
ANTI_SD	0.617	0.654	0.187	0.181	1	181,173
COMPETITION	0.760	0.765	0.072	0.404	1	181,173
CEO_TURNOVER	0.139	0	0.346	0	1	29,885
RETURN	0.104	-0.042	0.809	-1.180	5.542	170,705
ROA	-0.099	0.036	0.681	-7.424	0.375	176,601
MSCI	0.077	0	0.266	0	1	181,173

Table 3
Institutional Ownership and MSCI ACWI Membership: First Stage

This table shows the results of ordinary least squares (OLS) firm-level panel regressions of institutional ownership on MSCI ACWI membership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. *IO_FOR* is holdings by foreign institutions as a fraction of market capitalization. *MSCI* is a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise. Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	First Stage: *IO_FOR*		Placebo: *IO_DOM*	
	(1)	(2)	(3)	(4)
MSCI	0.063***	0.029***	-0.062***	-0.001
	(0.003)	(0.002)	(0.008)	(0.003)
IO_DOM	-0.014***	0.003*		
	(0.002)	(0.002)		
CLOSE	-0.008**	-0.010***	-0.146***	-0.051***
	(0.003)	(0.001)	(0.021)	(0.003)
FXSALES	0.033***	0.004***	0.021***	0.005*
	(0.003)	(0.001)	(0.003)	(0.003)
log(*SALES*)	0.007***	0.004***	0.045***	0.015***
	(0.001)	(0.000)	(0.007)	(0.001)
log(*K*/*L*)	0.002***	0.002***	0.008***	0.005***
	(0.000)	(0.000)	(0.002)	(0.001)
TOBIN_Q	0.001***	0.000***	0.002***	0.001***
	(0.000)	(0.000)	(0.001)	(0.000)
FCF	-0.003***	-0.001***	0.019***	0.001*
	(0.000)	(0.000)	(0.004)	(0.001)
LEVERAGE	-0.004***	-0.004***	-0.040***	-0.017***
	(0.001)	(0.000)	(0.002)	(0.002)
CASH	0.034***	0.008***	0.104***	0.034***
	(0.003)	(0.001)	(0.016)	(0.004)
PPE	-0.006***	-0.010***	-0.011*	-0.024***
	(0.001)	(0.002)	(0.006)	(0.005)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.30	0.81	0.60	0.92
Number of observations	179,125	175,912	179,125	175,912

Table 4
Foreign Institutional Ownership and Long-Term Investment

This table shows the results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of long-term investment on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets. In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
IO_FOR	0.041***	0.022***	0.108***	0.094**
	(0.006)	(0.005)	(0.016)	(0.038)
IO_DOM	-0.003	0.001	-0.002	0.001
	(0.002)	(0.005)	(0.002)	(0.003)
CLOSE	-0.002	0.005***	-0.001	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)
FXSALES	0.017***	-0.001	0.015***	-0.001
	(0.001)	(0.002)	(0.001)	(0.002)
log(*SALES*)	-0.002***	-0.001	-0.002***	-0.001**
	(0.000)	(0.001)	(0.000)	(0.001)
log(*K*/*L*)	0.004***	0.001**	0.004***	0.001**
	(0.000)	(0.001)	(0.000)	(0.001)
TOBIN_Q	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
FCF	-0.009***	-0.002***	-0.008***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
LEVERAGE	-0.017***	-0.023***	-0.016***	-0.023***
	(0.002)	(0.003)	(0.002)	(0.002)
CASH	0.101***	0.038***	0.099***	0.037***
	(0.004)	(0.003)	(0.005)	(0.003)
PPE	0.083***	-0.036***	0.084***	-0.036***
	(0.003)	(0.005)	(0.003)	(0.004)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.21	0.64		
Number of observations	179,125	175,912	179,125	175,912

Table 5
Foreign Institutional Ownership and Employment

This table shows the results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of innovation output on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the logarithm of the number of employees (*EMPLOYEES*). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
IO_FOR	1.131***	0.651***	6.997***	3.876***
	(0.104)	(0.061)	(0.528)	(0.458)
IO_DOM	0.734***	0.392***	0.874***	0.393***
	(0.034)	(0.029)	(0.032)	(0.025)
CLOSE	0.030	0.001	0.111***	0.037***
	(0.019)	(0.016)	(0.031)	(0.014)
FXSALES	0.321***	0.100***	0.094***	0.083***
	(0.022)	(0.016)	(0.028)	(0.021)
log(*SALES*)	0.741***	0.329***	0.673***	0.313***
	(0.006)	(0.012)	(0.007)	(0.007)
TOBIN_Q	0.012***	0.004***	0.006***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
FCF	-0.033***	0.045***	-0.004	0.048***
	(0.012)	(0.008)	(0.011)	(0.007)
LEVERAGE	-0.118***	-0.088***	-0.087***	-0.075***
	(0.015)	(0.014)	(0.016)	(0.015)
CASH	0.016	-0.075***	-0.237***	-0.103***
	(0.039)	(0.027)	(0.041)	(0.025)
PPE	0.780***	0.230***	0.746***	0.238***
	(0.033)	(0.031)	(0.035)	(0.037)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes
Industry fixed effects	Yes	Yes	Yes	No
Country fixed effects	Yes	Yes	Yes	No
R^2	0.80	0.97		
Number of observations	164,510	161,443	164,510	161,443

Table 6
Foreign Institutional Ownership and Innovation Output

This table shows results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of innovation output on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the logarithm of one plus the number of USPTO patent applications (*PATENTS*). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. A firm is required to have made at least one patent application over the sample period in the firm fixed effects regression. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
IO_FOR	0.611***	0.243**	7.662***	3.655***
	(0.084)	(0.099)	(0.815)	(1.006)
IO_DOM	0.329***	0.107***	0.463***	0.127***
	(0.045)	(0.033)	(0.047)	(0.043)
CLOSE	-0.031*	0.054***	0.053	0.099***
	(0.018)	(0.020)	(0.037)	(0.028)
FXSALES	0.209***	-0.057**	-0.039	-0.068**
	(0.030)	(0.028)	(0.025)	(0.032)
log(*SALES*)	0.037***	0.051***	-0.021***	0.032***
	(0.004)	(0.006)	(0.004)	(0.009)
log(*K*/*L*)	0.018***	-0.001	0.008**	-0.010
	(0.004)	(0.008)	(0.004)	(0.008)
log(*R&D_STOCK*)	0.048***	0.009***	0.034***	0.011***
	(0.003)	(0.002)	(0.003)	(0.003)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes
Industry fixed effects	Yes	Yes	Yes	No
Country fixed effects	Yes	Yes	Yes	No
R^2	0.27	0.82		
Number of observations	181,173	48,096	181,173	48,096

Table 7
Instrumental Variables Estimates with Bandwidth

This table shows the results of instrumental variables (IV) firm-level panel regressions of long-term investment, employment, and innovation output on institutional ownership using the bandwidth of 10% of the number of stocks around the MSCI ACWI cutoff point in each county. The cutoff point is the (free float-adjusted market capitalization) ranking of the first stock after which the index coverage is at least 85% of the free float-adjusted market capitalization in each country. The sample includes Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets, the logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	First Stage	IV		
Dependent variable	*IO_FOR*	*CAPEX+R&D*	*EMPLOYEES*	*PATENTS*
	(1)	(2)	(3)	(4)
IO_FOR		0.099***	7.485***	8.953***
		(0.032)	(0.572)	(0.940)
IO_DOM	0.001	0.001	0.322***	0.124***
	(0.003)	(0.006)	(0.051)	(0.040)
MSCI	0.035***			
	(0.002)			
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
R^2	0.41			
Number of observations	37,277	37,277	34,873	37,557

Table 8
Difference-in-Differences around Stock Additions to the MSCI ACWI

This table shows the results of difference-in-differences regressions of institutional ownership, long-term investment, employment, and innovation output around stock additions to the MSCI All Country World Index. Panel A shows pre-treatment means and medians of treated, non-treated, and control groups, and tests of the difference in mean and median between treated and control groups. Panel B shows the results of difference-in-differences regressions. The sample includes Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is foreign institutional ownership (*IO_FOR*), domestic institutional ownership (*IO_DOM*), the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets, the logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus number of patents applied with the USPTO (*PATENTS*). The treatment group is composed of the 574 firms added to the MSCI All Country World Index in the sample period. Control firms are the nearest neighbor firms matched using propensity scores. Non-treated firms are all other firms in the sample. *AFTER* is a dummy variable that takes a value of one in the year a firm is added to the MSCI ACWI and thereafter. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Pre-Treatment Sample Statistics

	Mean				Median			
	Non-Treated	Treated	Control	*t*-test (p-value)	Non-Treated	Treated	Control	Pearson χ^2 (*p*-value)
CAPEX+R&D	0.093	0.080	0.075	0.07	0.048	0.063	0.062	0.62
log(*EMPLOYEES*)	6.249	8.725	8.788	0.35	6.269	8.843	8.905	0.48
log(1+*PATENTS*)	0.220	0.823	0.854	0.58	0.000	0.000	0.000	0.76
CLOSE	0.287	0.302	0.316	0.19	0.241	0.266	0.278	0.38
FXSALES	0.150	0.265	0.265	0.99	0.000	0.149	0.167	0.48
log(*SALES*)	11.438	14.418	14.472	0.40	11.570	14.413	14.564	0.03
log(*R&D_STOCK*)	4.030	6.109	6.089	0.93	0.000	8.486	7.789	0.34
log(*K/L*)	3.690	4.444	4.396	0.46	3.673	4.294	4.240	0.59
IO_FOR	0.023	0.072	0.072	0.89	0.001	0.039	0.033	0.01

Panel B: Difference-in-Differences Regressions

Dependent variable	*IO_FOR*	*IO_DOM*	*CAPEX+R&D*	*EMPLOYEES*	*PATENTS*
	(1)	(2)	(3)	(4)	(5)
TREATED × AFTER	0.020***	-0.005	0.005***	0.143***	0.054**
	(0.003)	(0.004)	(0.002)	(0.019)	(0.022)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.86	0.97	0.78	0.97	0.95
Number of observations	5,740	5,740	5,740	5,740	5,740

Table 9
Type of Foreign Institutional Ownership: Investor Horizon

This table shows the results of firm-level panel regressions of long-term investment, employment, and innovation output on long- and short-term foreign institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets, the logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*). *IO_FOR_LT* is ownership by long-term foreign institutional investors, i.e., those who have a weighted average portfolio turnover rate below the median. *IO_FOR_ST* is ownership by short-term foreign institutional investors, i.e., those who have a weighted average portfolio turnover rate above the median. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one period. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	CAPEX+R&D	*EMPLOYEES*	*PATENTS*
	(1)	(2)	(3)
IO_FOR_LT	0.043***	1.452***	0.759***
	(0.008)	(0.146)	(0.167)
IO_FOR_ST	0.037***	0.535***	0.342*
	(0.013)	(0.182)	(0.204)
IO_DOM	-0.003	0.738***	0.331***
	(0.002)	(0.035)	(0.045)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
R^2	0.21	0.80	0.27
Number of observations	179,125	164,510	181,173

Table 10
Monitoring versus Career Concerns Channel

This table shows the results of firm-level panel regressions of long-term investment, employment, and innovation output on the interaction between foreign institutional ownership and proxies for the monitoring channel using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets, the logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*). Corporate governance is measured using the *GOV* index centered at the mean. Investor protection at the country-level is measured using the anti-self-dealing index (*ANTI_SD*). Product market competition is measured using one minus the median industry Lerner index (*COMPETITION*) centered at the mean. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one period. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	CAPEX+R&D			*EMPLOYEES*			*PATENTS*		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IO_FOR	0.037***	0.039***	0.041***	0.658***	1.101***	1.105***	1.237***	0.556***	0.621***
	(0.011)	(0.006)	(0.006)	(0.163)	(0.109)	(0.101)	(0.193)	(0.078)	(0.083)
IO_DOM	0.006***	-0.003	-0.003	0.395***	0.735***	0.703***	0.230***	0.332***	0.330***
	(0.002)	(0.002)	(0.002)	(0.027)	(0.034)	(0.036)	(0.027)	(0.045)	(0.046)
GOV	0.019***			0.515***			0.271***		
	(0.006)			(0.040)			(0.050)		
GOV × *IO_FOR*	-0.249***			-3.309***			-2.880**		
	(0.036)			(1.088)			(1.303)		
ANTI_SD		0.038			0.619***			-0.154	
		(0.025)			(0.238)			(0.311)	
ANTI_SD × *IO_FOR*		-0.050***			-0.883***			-1.568***	
		(0.013)			(0.329)			(0.339)	
COMPETITION			-0.004			-1.683***			0.116*
			(0.005)			(0.083)			(0.064)
COMPETITION × *IO_FOR*			0.032			0.845			-1.271***
			(0.042)			(0.521)			(0.419)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.31	0.21	0.21	0.86	0.80	0.80	0.38	0.28	0.27
Number of observations	36,957	179,125	179,215	35,263	164,510	164,510	37,061	181,173	181,173

Table 11
CEO Turnover-Performance Sensitivity

This table shows the results of firm-level probit regressions of CEO turnover-performance sensitivity and foreign institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable (*CEO_TURNOVER*) is a dummy variable that equals one if a firm's CEO is terminated in year *t*. The marginal effects of the interactions between foreign institutional ownership and excess stock return (*RETURN*) or change in return on assets (Δ*ROA*) are estimated using the Ai and Norton (2003) procedure. Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
IO_FOR	-0.048	-0.054
	(0.149)	(0.149)
RETURN × *IO_FOR*	-0.683**	
	(0.284)	
Δ*ROA* × *IO_FOR*		-1.362**
		(0.635)
IO_DOM	-0.065	-0.063
	(0.057)	(0.063)
RETURN	-0.175***	
	(0.040)	
Δ*ROA*		-0.081***
		(0.022)
log(*SALES*)	0.022***	0.023***
	(0.007)	(0.008)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Country fixed effects	Yes	Yes
Pseudo R^2	0.02	0.01
Number of observations	29,187	26,671
Marginal effect:		
RETURN × *IO_FOR*	-0.144**	
	(0.062)	
Δ*ROA* × *IO_FOR*		-0.295**
		(0.139)

Table 12
Human and Organization Capital

This table shows the results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of alternative measures of human and organization capital on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the ratio of staff costs-to-sales (*STAFF_COST*), the logarithm of staff costs per employee (*AV_STAFF_COST*), and the ratio of selling, general, and administrative expenses-to-sales (*SG&A*). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable – *STAFF_COST*				
IO_FOR	0.835***	0.128**	4.797***	1.297***
	(0.086)	(0.060)	(0.405)	(0.224)
IO_DOM	0.299***	0.047	0.378***	0.044
	(0.051)	(0.047)	(0.069)	(0.064)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.26	0.70		
Number of observations	72,350	70,129	72,350	70,129
Panel B: Dependent Variable – *AV_STAFF_COST*				
IO_FOR	0.426***	0.185***	2.815***	1.187***
	(0.071)	(0.053)	(0.282)	(0.436)
IO_DOM	0.075	0.030	0.130**	0.029
	(0.063)	(0.055)	(0.065)	(0.040)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.57	0.91		
Number of observations	69,431	67,376	69,431	67,376
Panel C: Dependent Variable – *SG&A*				
IO_FOR	1.003***	0.282***	6.954***	1.896***
	(0.122)	(0.052)	(0.687)	(0.208)
IO_DOM	0.129***	0.070***	0.266***	0.072***
	(0.045)	(0.017)	(0.047)	(0.020)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.48	0.82		
Number of observations	143,726	140,846	143,726	140,846

Table 13
Productivity, Foreign Sales, and Firm Value

This table shows the results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of measures of productivity and firm value on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the logarithm of sales (*SALES*) (Panel A), foreign sales as a fraction of total sales (*FXSALES*) (Panel B), and Tobin's Q (*TOBIN_Q*) (Panel C). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). Regressions include the same control variables as in Tables 4-6 (coefficients not shown). The regressions in Panel A include the logarithm of capital (*K*) and logarithm of labor (*L*) as controls. Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable – *SALES*				
IO_FOR	1.355***	0.438***	7.164***	1.919***
	(0.093)	(0.058)	(0.378)	(0.380)
IO_DOM	0.963***	0.341***	1.070***	0.339***
	(0.043)	(0.043)	(0.047)	(0.025)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.83	0.97		
Number of observations	171,327	168,222	171,327	168,222
Panel B: Dependent Variable – *FXSALES*				
IO_FOR	0.608***	0.076***	1.292***	0.430***
	(0.023)	(0.019)	(0.074)	(0.132)
IO_DOM	0.060***	0.022***	0.073***	0.021***
	(0.007)	(0.008)	(0.008)	(0.006)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.29	0.82		
Number of observations	179,125	175,912	179,125	175,912
Panel C: Dependent Variable – *TOBIN_Q*				
IO_FOR	4.421***	1.660***	30.310***	3.949*
	(0.524)	(0.434)	(3.693)	(2.054)
IO_DOM	0.567**	0.250*	1.444***	0.258***
	(0.260)	(0.138)	(0.297)	(0.090)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.36	0.66		
Number of observations	169,548	166,420	169,548	166,420

Figure 1
Long-Term Investment and Innovation Output by Country

This figure shows long-term investment in terms of CAPEX in billions of U.S. dollars (Panel A), R&D expenditures in billions of U.S. dollars (Panel B), and the number of USPTO patent filings (Panel C) by firms domiciled in each country for the sample period from 2001 to 2010. The sample consists of Worldscope non-financial and non-utility firms.

Panel A: Capital Expenditures

Panel B: R&D Expenditures

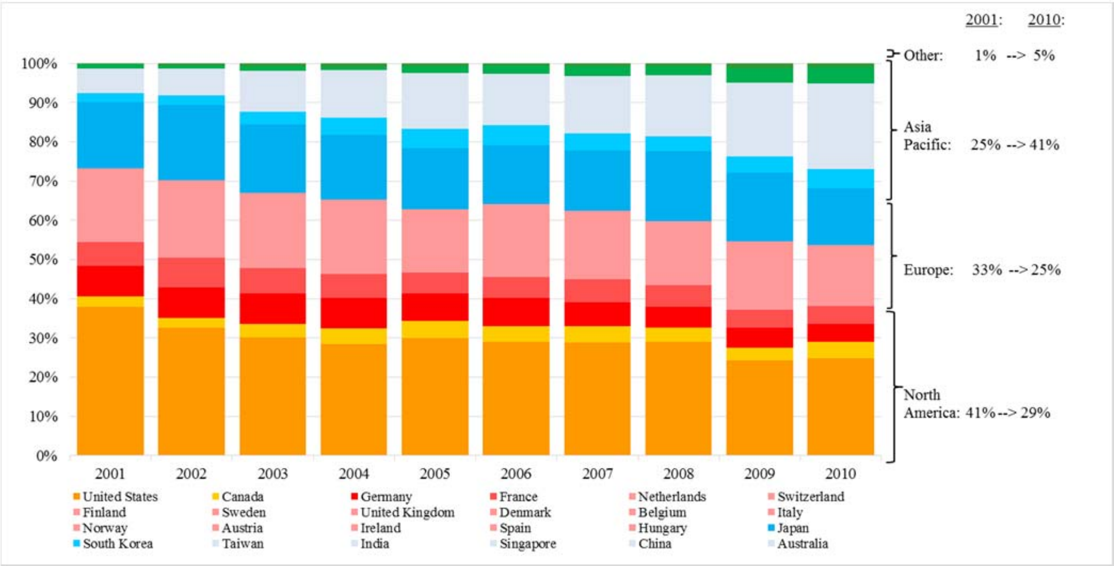
Figure 1 (continued)

Panel C: Patent Count

Figure 2
Long-Term Investment and Innovation Output by Country and Year

This figure presents CAPEX (Panel A), R&D expenditures (Panel B), and the number of USPTO patent applications (Panel C) by firms domiciled in each country as a percentage of the worldwide total in each year. The sample consists of Worldscope non-financial and non-utility firms in the 2001-2010 period.

Panel A: Capital Expenditures



Panel B: R&D Expenditures

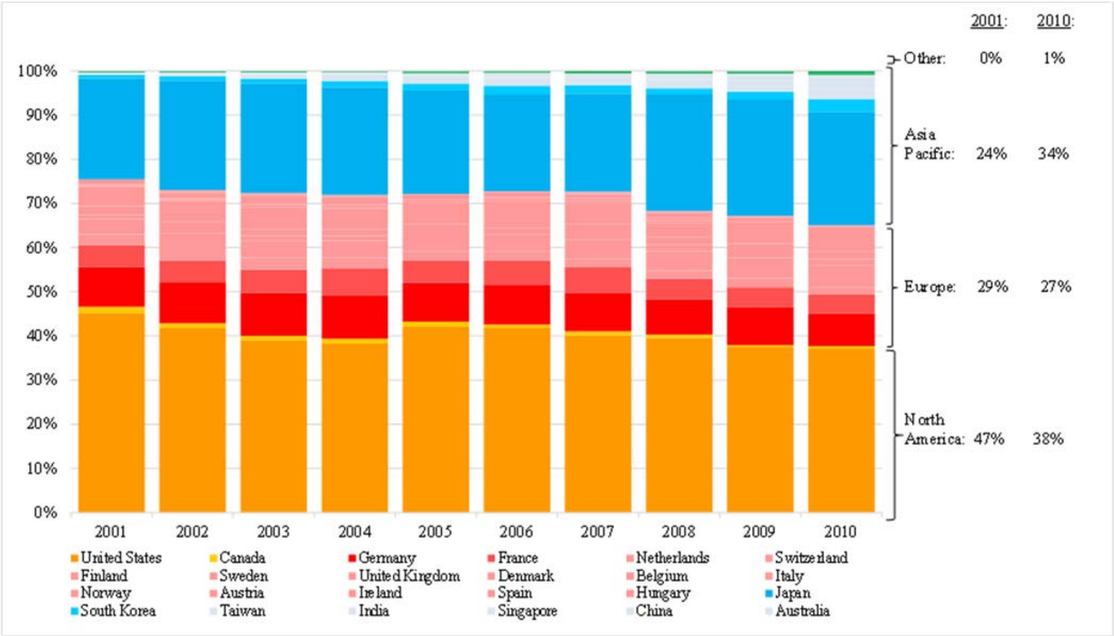


Figure 2 (continued)

Panel C: Patent Count

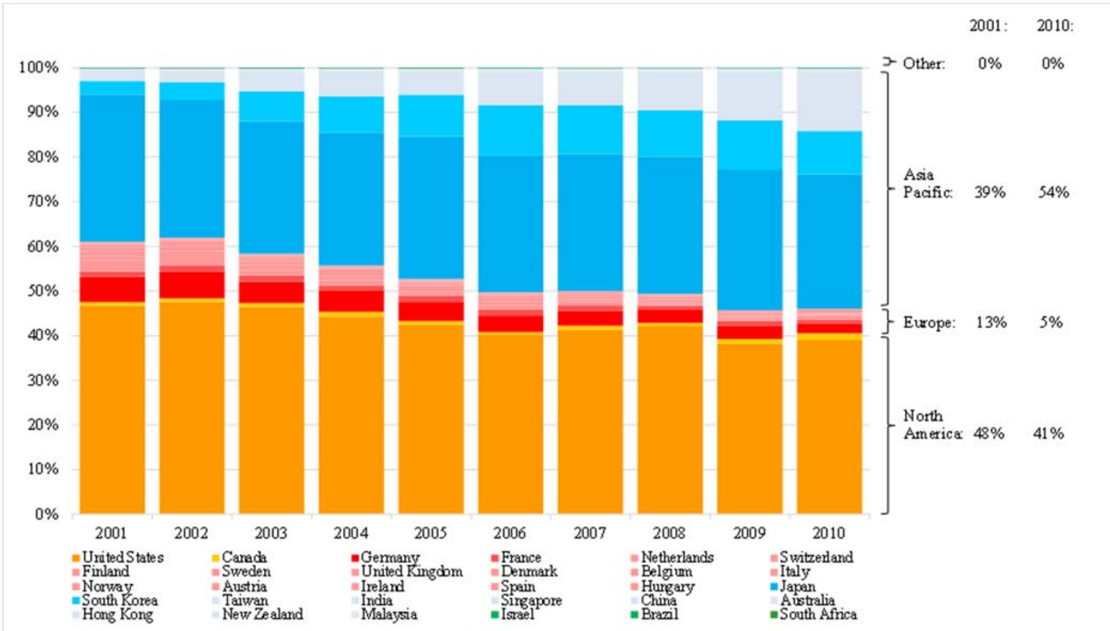


Figure 3
Long-Term Investment and Innovation Output: Top 10 Firms

This figure lists the top ten firms worldwide in terms of CAPEX in billions of U.S. dollars (Panel A), R&D expenditures in billions of U.S. dollars (Panel B), and the number of patents filed with the USPTO (Panel B) by year. The sample consists of Worldscope non-financial and non-utility firms in the 2001-2010 period.

Panel A: Capital Expenditures

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	FR Tlm (FR$8)	Daimler (DE,$26)	Daimler (DE,$28)	Daimler (DE,$33)	Daimler (DE,$32)	Daimler (DE,$41)	Daimler (DE,$23)	BMW (DE,$27)	PetroChina (CN,$38)	Petrobras (BR,$47)
2	Daimler (DE,$24)	Nippon (JP,$21)	Nippon (JP,$16)	Nippon (JP,$17)	Nippon (JP,$14)	Toyota (JP,$23)	Dutch Shell (UK,$24)	Toyota (JP,$30)	Toyota (JP,$25)	PetroChina (CN,$39)
3	Nippon (JP,$22)	Verizon (US,$12)	Avis (US,$15)	Avis (US,$13)	BMW (DE,$16)	BMW (DE,$20)	Ferrovial (ES,$4)	Dutch Shell (UK,$27)	Dutch Shell (UK,$27)	Dutch Shell (UK,$27)
4	Verizon (US,$17)	Avis (US,$18)	Toyota (JP,$14)	Toyota (JP,$15)	Toyota (JP,$16)	Verizon (US,$17)	Toyota (JP,$25)	PetroChina (CN,$32)	BMW (DE,$18)	Toyota (JP,$18)
5	VW (DE,$6)	BP (UK,$13)	BP (UK,$13)	BP (UK,$14)	BP (UK,$12)	Dutch Shell (UK,$24)	BMW (DE,$26)	Petrobras (BR,$22)	Petrobras (BR,$40)	Exxon (US,$27)
6	AT&T (US,$9)	AT&T (US,$7)	Dutch Shell (UK,$13)	Dutch Shell (UK,$13)	Dutch Shell (UK,$15)	PetroChina (CN,$17)	Verizon (US,$18)	Daimler (DE,$12)	AT&T (US,$17)	BP (UK,$19)
7	Vodafone (UK,$2)	Exxon (US,$11)	Verizon (US,$12)	Exxon (US,$12)	Verizon (US,$15)	WalMart (US,$16)	PetroChina (CN,$24)	AT&T (US,$20)	Chevron (US,$20)	Chevron (US,$20)
8	AT&T (US,$11)	Dutch Shell (UK,$13)	Exxon (US,$13)	BMW (DE,$16)	Avis (US,$12)	Exxon (US,$15)	BP (UK,$18)	BP (UK,$18)	Exxon (US,$22)	BMW (DE,$19)
9	MCI (US,$8)	AT&T (US,$4)	BMW (DE,$12)	Verizon (US,$13)	WalMart (US,$15)	Nippon (JP,$14)	WalMart (US,$15)	Verizon (US,$17)	Conoco (US,$11)	ENI (IT,$17)
10	Toyota (JP,$9)	Toyota (JP,$13)	WalMart (US,$10)	WalMart (US,$13)	Exxon (US,$14)	Avis (US,$11)	Conoco (US,$12)	Chevron (US,$20)	BP (UK,$21)	Verizon (US,$16)

Panel B: R&D Expenditures

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Ford (US,$7)	Ford (US,$8)	Ford (US,$8)	Sanofi (FR,$10)	Ford (US,$8)	Pfizer (US,$7)	Toyota (JP,$8)	Toyota (JP,$9)	Toyota (JP,$10)	Roche (CH,$10)
2	Siemens (DE,$6)	Daimler (DE,$6)	Pfizer (US,$7)	Microsoft (US,$8)	Pfizer (US,$7)	Ford (US,$7)	J&J (US,$8)	Microsoft (US,$8)	Roche (CH,$9)	Pfizer (US,$9)
3	IBM (US,$5)	Siemens (DE,$6)	Daimler (DE,$7)	Daimler (DE,$8)	Daimler (DE,$7)	J&J (US,$7)	Pfizer (US,$8)	Roche (CH,$8)	Microsoft (US,$9)	Novartis (CH,$9)
4	Daimler (DE,$5)	Pfizer (US,$5)	Siemens (DE,$6)	Pfizer (US,$8)	Toyota (JP,$6)	Daimler (DE,$7)	Ford (US,$8)	J&J (US,$8)	Pfizer (US,$8)	Toyota (JP,$9)
5	Pfizer (US,$5)	Toyota (JP,$5)	Toyota (JP,$6)	Ford (US,$7)	J&J (US,$6)	Toyota (JP,$7)	Roche (CH,$7)	Pfizer (US,$8)	Novartis (CH,$8)	Microsoft (US,$9)
6	Cisco (US,$5)	Panasonic (JP,$5)	Panasonic (JP,$5)	Siemens (DE,$7)	Microsoft (US,$6)	GlaxoSK (UK,$7)	Microsoft (US,$7)	Novartis (CH,$7)	Nokia (FI,$7)	Merck (US,$8)
7	Ericsson (SE,$4)	GlaxoSK (UK,$4)	GlaxoSK (UK,$5)	Toyota (JP,$7)	Siemens (DE,$6)	Siemens (DE,$7)	Nokia (FI,$7)	Ford (US,$7)	J&J (US,$7)	Samsung (KR,$8)
8	Microsoft (US,$4)	Microsoft (US,$4)	J&J (US,$5)	Panasonic (JP,$6)	IBM (US,$6)	Microsoft (US,$7)	Novartis (CH,$7)	Nokia (FI,$7)	Sanofi (FR,$7)	J&J (US,$7)
9	Motorola (US$4)	IBM (US,$4)	Microsoft (US,$5)	GlaxoSK (UK,$5)	GlaxoSK (UK,$5)	IBM (US,$6)	Sanofi (FR,$7)	Honda (JP,$6)	Boeing (US,$7)	Nokia (FI,$7)
10	Lucent (US,$4)	Intel (US,$4)	IBM (US,$5)	J&J (US,$5)	Panasonic (JP,$5)	Intel (US,$6)	GlaxoSK (UK,$6)	Sanofi (FR,$6)	Honda (JP,$6)	Intel (US,$7)

Figure 3 (continued)

Panel C: Patent Count

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	IBM (US,4016)	IBM (US,3547)	IBM (US,3971)	IBM (US,3730)	Samsung (KR,3857)	Samsung (KR,4527)	IBM (US,5252)	IBM (US,6937)	IBM (US,2223)	Hon Hai (TW,1125)
2	HP (US,2675)	HP (US,2321)	Samsung (KR,3015)	Samsung (KR,3637)	IBM (US,3731)	IBM (US,3691)	Samsung (KR,4391)	Samsung (KR,3284)	Samsung (KR,2107)	Samsung (KR,1020)
3	Panasonic (JP,2424)	Panasonic (JP,2168)	HP (US,2685)	Microsoft (US,2918)	Microsoft (US,3382)	Panasonic (JP,2214)	Panasonic (JP,1871)	Panasonic (JP,1468)	Hon Hai (TW,1514)	IBM (US,807)
4	Hitachi (JP,2219)	Samsung (KR,2040)	Panasonic (JP,2355)	Panasonic (JP,2450)	Panasonic (JP,2412)	Microsoft (US,2050)	Microsoft (US,1664)	Sony (JP,1411)	Sony (JP,1106)	Panasonic (JP,552)
5	Sony (JP,1941)	Intel (US,2040)	Intel (US,2263)	Intel (US,1949)	Sony (JP,2168)	Sony (JP,1678)	Sony (JP,1640)	Hon Hai (TW,1354)	Panasonic (JP,956)	Sony (JP,526)
6	Micron (US,1940)	Micron (US,2021)	Microsoft (US,1762)	HP (US,1839)	Fujitsu (JP,1657)	Intel (US,1422)	Hitachi (JP,1214)	Hitachi (JP,1312)	Fujitsu (JP,859)	NEC (JP,488)
7	Intel (US,1805)	Hitachi (JP,1884)	Micron (US,1578)	Hitachi (JP,1713)	Intel (US,1642)	Micron (US,1402)	Seiko (JP,1207)	Microsoft (US,1174)	Seiko (JP,852)	Micron (US,469)
8	Philips (NL,1726)	Sony (JP,1602)	Sony (JP,1539)	Micron (US,1635)	HP (US,1552)	Seiko (JP,1369)	LG (KR,1128)	Seiko (JP,1121)	Hitachi (JP,668)	Seiko (JP,442)
9	Fujitsu (JP,1617)	Philips (NL,1465)	Hitachi (JP,1539)	Sony (JP,1610)	Seiko (JP,1372)	Hitachi (JP,1320)	Intel (US,1082)	Ricoh (JP,1059)	LG (KR,640)	Hitachi (JP,372)
10	Samsung (KR,1607)	Fujitsu (JP,1404)	Fujitsu (JP,1230)	Fujitsu (JP,1445)	Micron (US,1352)	Fujitsu (JP,1244)	Ricoh (JP,1076)	Fujitsu (JP,911)	Ricoh (JP,626)	Fujitsu (JP,370)

Figure 4
Foreign Institutional Ownership around the MSCI ACWI Cutoff Point

This figure plots average foreign institutional ownership (*IO_FOR*) and the cumulative share of firms included in the MSCI ACWI. The cutoff point is the (free float-adjusted market capitalization) ranking of the first stock after which the index coverage is at least 85% of the free float-adjusted market capitalization in each country. The dots correspond to the sample mean within each bin, and the number of bins is selected to mimic the variability of the data. The solid line is a second-order polynomial fit estimated separately for firms above and below the cutoff ranking. The sample includes Worldscope non-financial and non-utility firms in 2009.

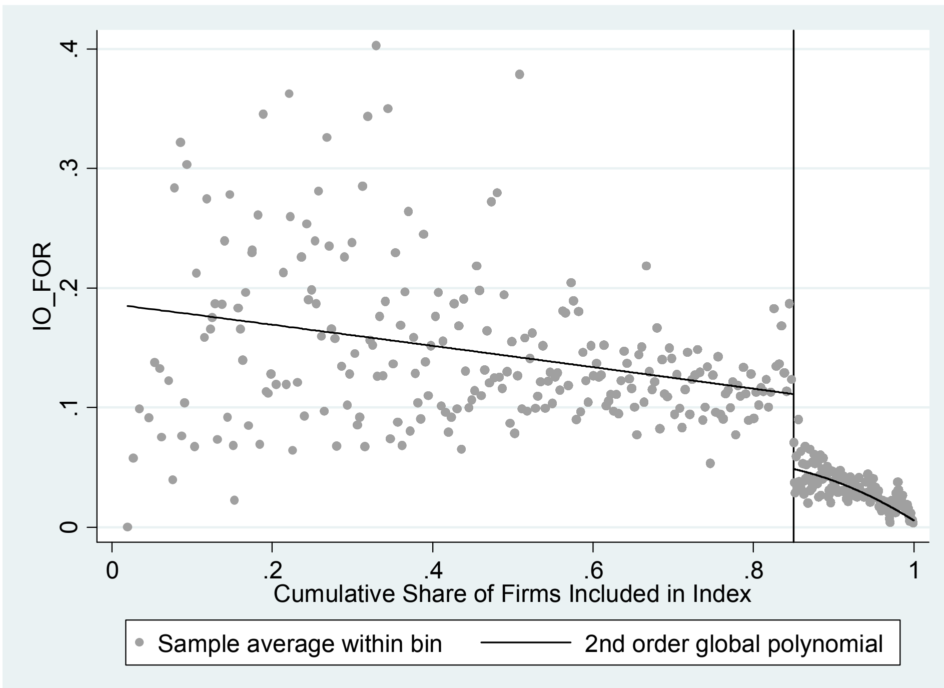
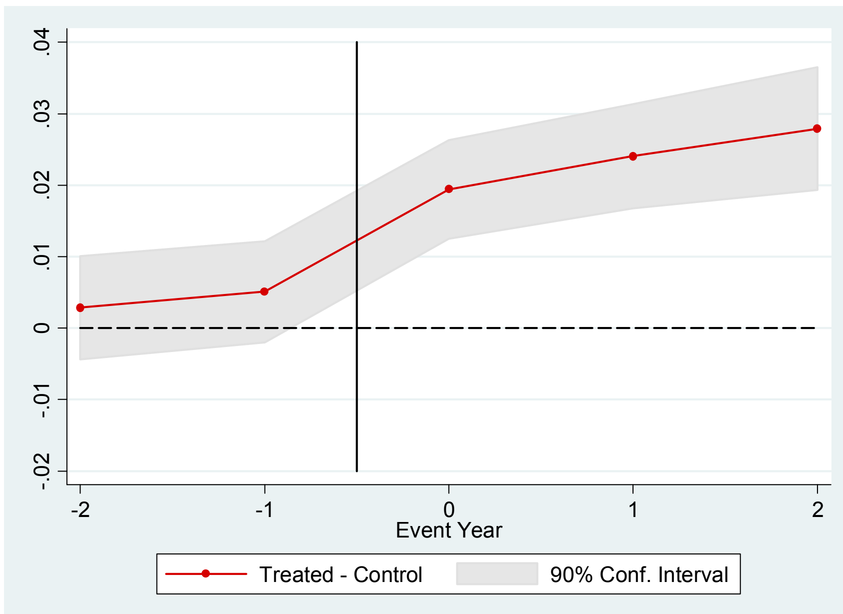


Figure 5
Institutional Ownership around Stock Additions to the MSCI ACWI

This figure shows point estimates and 90% confidence intervals of difference-in-differences regression results of foreign and domestic institutional ownership around stock additions to the MSCI All Country World Index. This is based on estimation with treatment variable interacted with indicators for event years. The index additions occur between year -1 and year 0. Firms that are added to the MSCI ACWI are in the treatment group. Control firms are the nearest neighbor firms matched using propensity scores. The sample includes Worldscope non-financial and non-utility firms in the 2001-2010 period. Variable definitions are provided in Table A.1 in the Appendix.

Panel A: Foreign Institutional Ownership



Panel B: Domestic Institutional Ownership

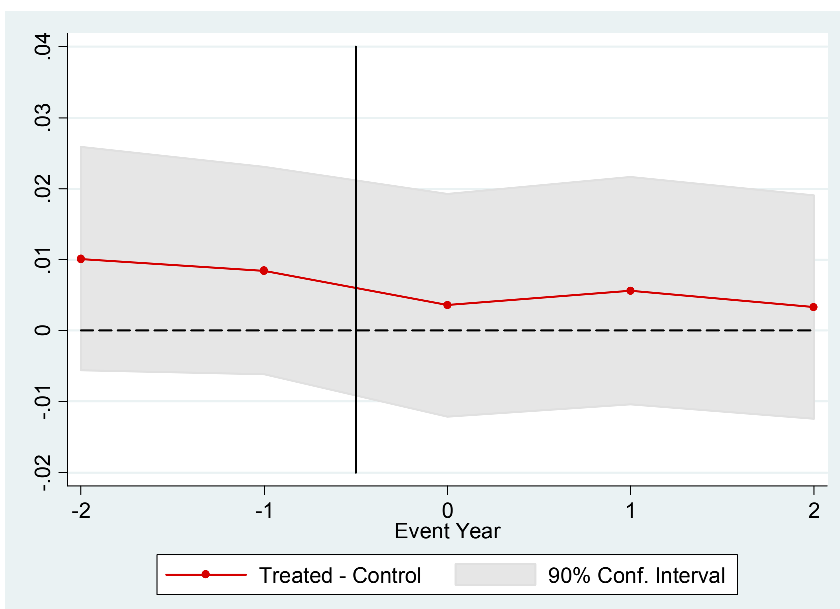
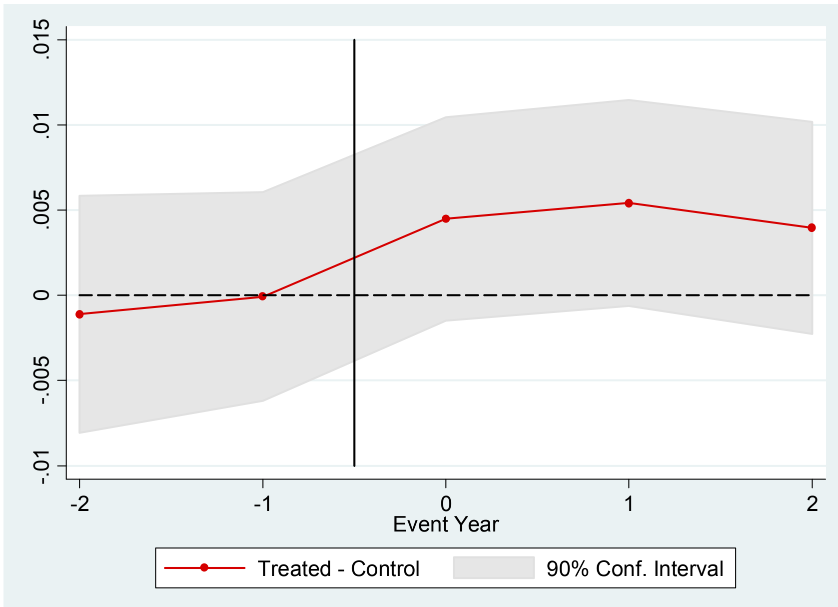


Figure 6
Long-Term Effects around Stock Additions to the MSCI ACWI

This figure shows point estimates and 90% confidence intervals of difference-in-differences regressions of long-term investment (R&D plus CAPEX-to-assets ratio), employment (number of employees), and innovation output (patent counts) around stock additions to the MSCI All Country World Index. This is based on estimation with treatment variable interacted with indicators for event years. The index additions occur between year -1 and year 0. Firms that are added to the MSCI ACWI are in the treatment group. Control firms are the nearest neighbor firms matched using propensity scores. The sample includes Worldscope non-financial and non-utility firms in the 2001-2010 period. Variable definitions are provided in Table A.1 in the Appendix.

Panel A: Long-Term Investment



Panel B: Employment

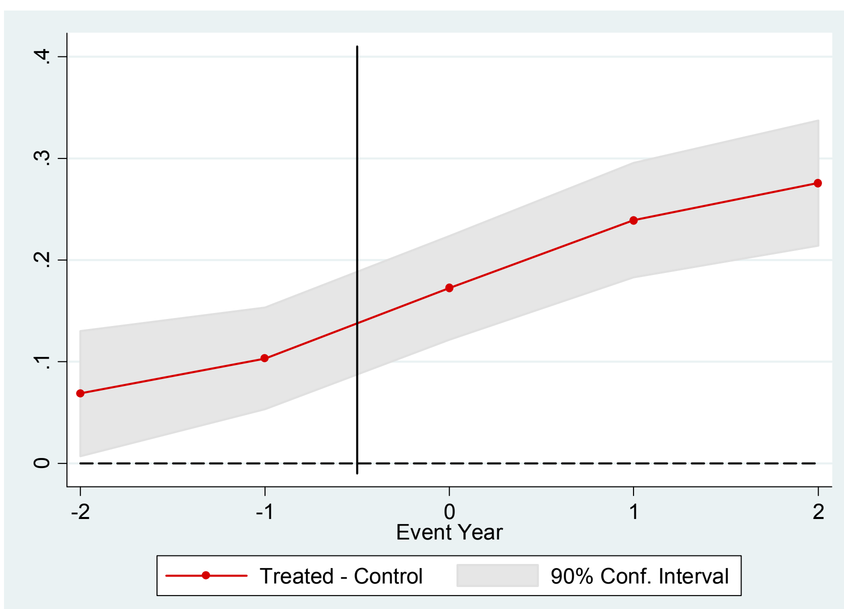
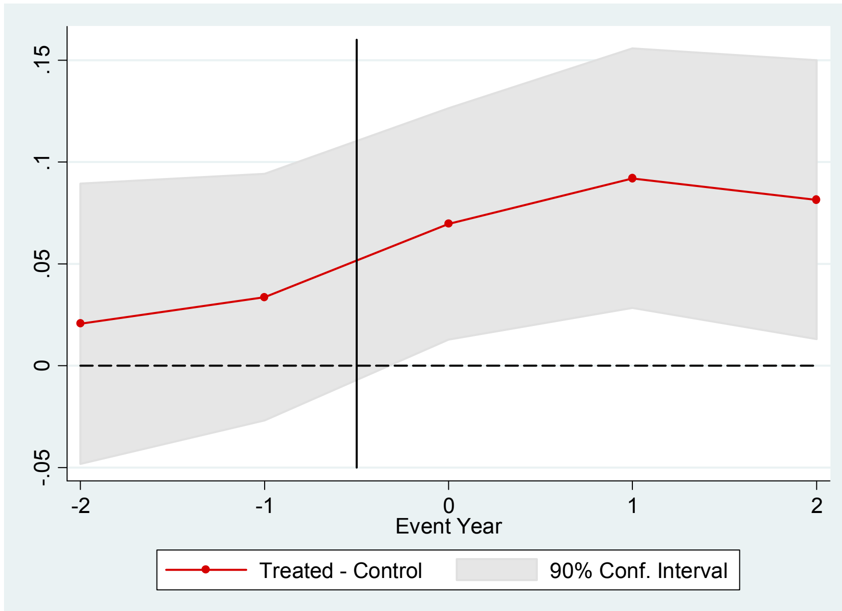


Figure 6 (continued)

Panel C: Patent Count



Appendix

Table A.1
Variable Definitions

Variable	Definition
CAPEX+R&D	Capital expenditures (Worldscope item 04601) plus research and development expenditures (Worldscope item 01201) divided by total assets (Worldscope item 02999).
EMPLOYEES	Number of employees (Worldscope item 07011).
PATENTS	Number of patents applied with the USPTO.
TOBIN_Q	Total assets (Worldscope item 02999) plus market value of equity (Worldscope item 08001) minus book value of equity (Worldscope item 03501) divided by total assets (Worldscope item 02999).
SALES	Sales in thousands of dollars (Worldscope item 01001).
FXSALES	Foreign sales (Worldscope item 07101) as a proportion of total sales (Worldscope item 01001).
STAFF_COST	Staff costs (Worldscope item 01084) divided by sales (Worldscope item 01001).
AV_STAFF_COST	Staff costs in thousands of dollars (Worldscope item 01084) divided by the number of employees (Worldscope item 07011).
SG&A	Selling, general, and administrative expenses (Worldscope item 01101) divided by sales (Worldscope item 01001).
IO_TOTAL	Holdings (end-of-year) by all institutions as a fraction of market capitalization (FactSet/LionShares).
IO_FOR	Holdings (end-of-year) by institutions located in a different country from the country where the stock is listed as a fraction of market capitalization (FactSet/LionShares).
IO_DOM	Holdings (end-of-year) by institutions located in the same country where the stock is listed as a fraction of market capitalization (FactSet/LionShares).
IO_FOR_LT	Holdings (end-of-year) by long-term foreign institutions, defined as those with weighted average portfolio turnover rate below the median, as a fraction of market capitalization (FactSet/LionShares).
IO_FOR_ST	Holdings (end-of-year) by short-term foreign institutions, defined as those with weighted average portfolio turnover rate above the median, as a fraction of market capitalization (FactSet/LionShares).
CLOSE	Number of shares held by insiders (shareholders who hold 5% or more of the outstanding shares, such as officers and directors and immediate families, other corporations or individuals), as a fraction of the number of shares outstanding (Worldscope item 08021).
K/L	Net property, plant, and equipment (Worldscope item 02501) divided by the number of employees (Worldscope item 07011).
R&D_STOCK	$S_t = R_t + (1 - \delta)\, S_{t-1}$ where S is the R&D stock, R is the R&D expenditure in dollars in year t, and $\delta = 0.15$ is the private depreciation rate of knowledge.
FCF	Net income before extraordinary items (Worldscope item 01551) plus depreciation (Worldscope item 04049) minus capital expenditures (Worldscope item 04601) divided by total assets (Worldscope item 02999).
LEVERAGE	Total debt (Worldscope item 03255) divided by total assets (Worldscope item 02999).

Table A.1 (continued)

Variable	Definition
PPE	Net property, plant, and equipment (Worldscope item 02501) divided by total assets (Worldscope item 02999).
CASH	Cash holdings (Worldscope item 02001) divided by total assets (Worldscope item 02999).
GOV	Corporate governance index, which measures compliance with 41 governance attributes (RiskMetrics/ISS).
ANTI_SD	Anti-self-dealing index which measures the strength of minority shareholder protection against self-dealing by the controlling shareholder (Djankov, La Porta, Lopez-de-Silanes, Shleifer (2008))
COMPETITION	Product market competition is measured as one minus the industry Lerner index, where the Lerner index equals the median gross profit margin (Worldscope item 08306) in a given two-digit SIC code.
CEO_TURNOVER	Dummy that equals one if the firm's CEO is terminated, and zero otherwise (BoardEx).
RETURN	Stock return minus the local country market return denominated in dollars (Datastream).
ROA	Net income before extraordinary items (Worldscope item 01551) plus interest expenses (Worldscope item 01251) divided by total assets (Worldscope item 02999).
MSCI	Dummy that equals one if a stock is a member of the MSCI All Country World Index, and zero otherwise (Bloomberg).

Internet Appendix to
"Are Foreign Investors Locusts?
The Long-Term Effects of Foreign Institutional Ownership"

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Matching Between USPTO and Worldscope

In this Appendix, we describe the algorithm we follow to match patent assignees of the patents awarded by the United States Patent and Trademark Office (USPTO) to firms in the Worldscope database for the January 1990 through December 2010 period. Using historical data, for each firm in Worldscope, we compile the list of all names used by each firm currently and in the past (we use both "name" and "extended name" Worldscope variables). We also collect each firm's country of incorporation. For each patent, we obtain the set of assignees listed on the patent grant publication document issued by the USPTO. For each assignee, USPTO provides assignee country of domicile and indicates its type: U.S. corporation, non-U.S. corporation, individual, government agency, or other. To be used for matching, we require the patent to have at least one patent assignee indicated as a U.S. corporation or non-U.S. corporation.

In the first step of our matching algorithm, we standardize patent assignee names and Worldscope firm names using regular expression language. Our standardization focuses on three main aspects of assignee/firm names:

1. We ensure that assignee/firm name strings only contain a-z, A-Z, and 0-9 characters. That means we eliminate any diacritical marks and use only the letter. For example, we replace "â" to "a," "ü" to "u," "&Oacute" to "O," "&Uuml" to "U," "&#200" to "E" etc. We do 292 such character replacements. We also remove multiple-character endings added to firm name strings by the Thomson Reuters data vendor for reasons unrelated to firm names. For example, "- ARD," "- CONSOLIDATED," "- PRO FORMA" etc. We use 46 regular expressions to perform these removals.
2. We unify the way suffixes (that typically describe the legal form of incorporation) of firm names appear in the assignee/firm name strings. For example, all the German suffixes for "GmbH" in any form ("G.M.B.H.," "G. M. B. H.," "g m b h," "G m b H," "G. m. b. H.," "G m. b. H", etc.) are changed to the same unified string "GMBH." There are 817 different suffixes we process according to this scheme using regular expression language. This ensures that differences between assignee and firm name strings do not arise because of cosmetic

differences in firm names. To minimize the probability of mistakenly changing a non-suffix part of the firm name, this procedure is country-specific (i.e., we only make the above replacements if the respective suffix is used by firms incorporated in a country).

3. We abbreviate non-unique parts of assignee/firm names that have low relevance for matching. For example, the word "CORPORATION" appears in many firm names and hence can be used to distinguish one firm name from another only marginally. We abbreviate it to "CORP" taking into account all likely misspellings of this word (e.g., "COPRPORATION," "CORPOIRATION," "CORPORTATION," "COROPORTION," "CORPOORATION," etc.). Another example is Japanese "KABUSHIKI KAISHA," which we abbreviate to "KAB KSHA" using regular expressions like "K[K]*ABUSH[IS]*KI[\.&-]*KAISH[I]*A," "KAB[UA]SHI[KN]I[\.&-]*[KH]AIS[HY]A," etc. In total, we abbreviate 302 terms like "CORPORATION" using 1,212 different regular language expressions. This step makes unique elements of assignee/firm names longer than non-unique elements, for a more efficient fuzzy-string matching procedure.

In the second step, we create a data set that includes all pairwise combinations of standardized patent assignee name strings and standardized Worldscope firm name strings. There are 156,609 different standardized Worldscope firm name strings and 405,666 different standardized patent assignee name strings, leading to approximately 63.5 billion pairs. We match all assignee-firm name pairs using the Bigram string comparison algorithm. The bigram algorithm is used to compare two strings using all combinations of two consecutive characters within each string. For example, the word "bigram" contains the bigram as follows: "bi," "ig," "gr," "ra," and "am." We code the bigram comparison function to return a value between zero and one, so that it counts the total number of bigrams that are common between the two strings divided by the average number of bigrams in the two strings. The bigram algorithm is very effective for our purposes because it is fast and good at handling misspellings and omission of characters, as well as the swapping of words in a string.

For assignee-firm name pairs with a bigram score above 0.5, we also compute the

Levenshtein distance between the two strings. Intuitively, the Levenshtein distance between two strings is the minimum number of single-character edits (specifically, insertion, deletion, and substitution of characters) required to change one string into another. Using the bigram score, Levenshtein distance, and the length of the two strings in the assignee-firm name pairs, we identify the closest Worldscope firm name for each patent assignee. We then decide whether each assignee is matched to a Worldscope firm or not, according to a metric that combines the bigram score with the Levenshtein distance. We also impose a condition that the firm's country of incorporation obtained from Worldscope is the same as the assignee's country of domicile recorded in the USPTO data. These steps result in a database that uniquely links USPTO patent numbers to Worldscope firm codes.

We perform extensive checks on our standardization-matching algorithm. First, to find the closest matches, we use different thresholds for the bigram score and the Levenshtein distance. Second, instead of standardizing the suffixes of firm names, we eliminate them from the firm name and match on the so-called stem name. These alterations, even for rather extreme parameter values, have a limited impact on the matching outcome: assignments of less than 5% of patents in our data are affected. Last, using random subsamples of patents, we manually check the results of the standardization-matching algorithm and compute type I and type II errors. We find that both types of errors are lower than 1%.

We do not have data on the list of subsidiaries owned by Worldscope firms at each point in time. For this reason, the patent portfolio we assign to firms in our sample might be smaller than the patent portfolio these firms effectively control. The robustness checks on the matching procedure we discuss above partially address this concern, as the names of subsidiaries are often similar to names of their parent companies; typically, they share the unique part of the name, like "SIEMENS" or "LAFARGE" for example.

For patents awarded to Worldscope firms that are incorporated in the U.S., we compare the outcome of our matching algorithm with the matching provided by the NBER Patent Data Project. We first compile a link table between firm codes in Worldscope and GVKEYs in

Compustat. Next, for Worldscope firms in our final sample with GVKEY, we compare the counts of patents in our data with that of the NBER Patent Data Project.

Panel A of Table A.1 provides three examples of firms with large patent portfolios: IBM, Honeywell, and Google. The table shows that, since the NBER dataset is based on patents awarded by the USPTO up to 2006, the NBER data can represent innovation output (patents filed) only up to the year 2002. In contrast, we use patent grant publication documents issued by the USPTO through the end of June 2013, which allows us to have a representative measure of innovation output over our entire sample period. Panel B of Table A.1 shows, for each year in our sample, summary statistics that compare the distribution of the counts of patents in our data with that of the NBER data. We show that the two distributions are comparable in the 2000-2002 period during which the NBER data are available. In the 2000-2002 period for which NBER data is available, patent counts in our data are comparable to that of the NBER data. The last column of Panel B shows that the correlation coefficient between counts of patents in our data and the NBER data is above 0.95 in the 2000-2002 period.

Table IA.1
Comparison to NBER Patent Matching

This table shows the number of patent applications with the USPTO assigned to selected firms by our matching algorithm (column "Matching") and the NBER matching (column "NBER") by year. Panel A provides three examples of firms with large patent portfolios. Panel B provides the mean, standard deviation, and 95th percentile of the number of patents assigned by the "Matching" and the NBER algorithms by year for the sample of U.S. firms. The last column reports the correlation between the numbers of patents obtained with the two matching algorithms in the 2000-2002 period during which the NBER data is available.

	Panel A: Examples						Panel B: Summary Statistics								
	IBM		Honeywell		Google		Matching				NBER				Correlation
Year	Matching	NBER	Matching	NBER	Matching	NBER	Nr. of Observ.	Mean	Standard Deviation	95th	Nr. of Observ.	Mean	Standard Deviation	95th	
2001	4,016	3,456	480	487	0	0	37,856	6.38	80.11	13	40,977	6.91	73.63	14	0.96
2002	3,547	2,361	570	501	0	0	38,057	6.85	79.25	15	34,102	6.14	59.40	14	0.95
2003	3,971	1,842	593	434	0	0	36,550	7.07	87.11	14	25,724	4.98	47.91	12	
2004	3,730	802	746	286	0	2	35,857	7.40	87.85	16	12,738	2.63	24.21	6	
2005	3,731	179	822	58	178	0	35,141	7.30	88.26	15	3,246	0.67	6.24	2	
2006	3,691	6	741	3	193	0	31,906	6.76	76.00	15	182	0.04	0.37	0	
2007	5,252	0	728	0	249	0	30,722	6.59	89.41	14					
2008	6,937	0	684	0	229	0	27,117	6.02	109.29	12					
2009	2,223	0	312	0	205	0	16,258	3.88	42.53	10					
2010	807	0	140	0	165	0	8,736	2.22	19.78	7					

Table IA.2
Long-Term Effects of Foreign Institutional Ownership: Reduced-Form Regression

This table shows the results of ordinary least squares (OLS) firm-level panel regressions of long-term investment, employment, and innovation output on the instrument (*MSCI*) using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. *MSCI* is a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	CAPEX+R&D		*EMPLOYEES*		*PATENTS*	
	(1)	(2)	(3)	(4)	(5)	(6)
MSCI	0.007***	0.003**	0.435***	0.109***	0.498***	0.097***
	(0.001)	(0.001)	(0.016)	(0.013)	(0.035)	(0.021)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No	Yes	No
R^2	0.21	0.64	0.80	0.97	0.30	0.82
Number of observations	179,125	175,912	164,510	161,443	181,173	48,096

Table IA.3
Difference-in-Differences around Stock Deletions from the MSCI ACWI

This table shows the results of difference-in-differences regressions of institutional ownership, long-term investment, employment, and innovation output around stock deletions from the MSCI All Country World Index. The sample includes Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is foreign institutional ownership (*IO_FOR*), domestic institutional ownership (*IO_DOM*), the sum of capital expenditures and R&D expenditures (*CAPEX+R&D*) as a fraction of assets, the logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus number of patents applied with the USPTO (*PATENTS*). The treatment group is composed of the 167 firms that were delisted from the MSCI All Country World Index in the sample period. Control firms are the nearest neighbor firms matched using propensity scores. *AFTER* is a dummy variable that takes a value of one in the year a firm is delisted from the MSCI ACWI and thereafter. Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Dependent variable	*IO_FOR*	*IO_DOM*	*CAPEX+R&D*	*EMPLOYEES*	*PATENTS*
	(1)	(2)	(3)	(4)	(5)
TREATED × AFTER	-0.019***	-0.011**	-0.002	-0.070*	-0.078**
	(0.005)	(0.005)	(0.004)	(0.040)	(0.037)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.92	0.96	0.76	0.95	0.91
Number of observations	1,670	1,670	1,670	1,670	1,670

Table IA.4
Alternative Channels: Financial Constraints and Stock Liquidity

This table shows the results of firm-level panel OLS regressions of long-term investment, employment, and innovation output on the interaction between foreign institutional ownership and alternative channels using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures as a fraction of assets (*CAPEX+R&D*), logarithm of the number of employees (*EMPLOYEES*), and the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*). Financial constraints are measured by the Kaplan-Zingales index (*KZ_INDEX*) centered at the mean. Stock liquidity is measured by the Amihud illiquidity ratio (*AMIHUD*) centered at the mean. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one period. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	CAPEX+R&D		*EMPLOYEES*		*PATENTS*	
	(1)	(2)	(3)	(4)	(5)	(6)
IO_FOR	0.042***	0.039***	1.058***	1.076***	0.591***	0.577***
	(0.006)	(0.006)	(0.108)	(0.170)	(0.077)	(0.084)
IO_DOM	-0.004*	-0.006***	0.707***	0.745***	0.345***	0.323***
	(0.002)	(0.002)	(0.035)	(0.036)	(0.043)	(0.045)
KZ_INDEX	0.003***		0.002		0.009***	
	(0.000)		(0.004)		(0.001)	
KZ_INDEX × IO_FOR	-0.000		-0.051**		-0.095***	
	(0.002)		(0.024)		(0.031)	
AMIHUD		-0.003***		-0.011***		0.011***
		(0.001)		(0.003)		(0.002)
AMIHUD × IO_FOR		-0.011***		-2.050		-0.086***
		(0.001)		(2.796)		(0.006)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.21	0.21	0.81	0.80	0.27	0.28
Number of observations	170,107	170,874	155,771	157,983	170,107	172,743

Table IA.5
Sample of Non-U.S. Firms

This table shows the results of ordinary least squares (OLS) and instrumental variables (IV) firm-level panel regressions of long-term investment, employment, and innovation output on institutional ownership using a sample of Worldscope non-financial and non-utility firms, with headquarters outside the U.S., in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures as a fraction of assets (*CAPEX+R&D*) (Panel A), the logarithm of the number of employees (*EMPLOYEES*) (Panel B), and the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*) (Panel C). In the IV regressions, foreign institutional ownership is instrumented with *MSCI* (a dummy variable that equals one if a firm is a member of the MSCI All Country World Index, and zero otherwise). In fixed-effects regressions a firm is required to have made at least one patent application over the sample period (Panel B) and to have at least two observations. Variable definitions are provided in Table A.1 in the Appendix. All explanatory variables are lagged by one year. A firm is required to have made at least one patent application over the sample period in the firm fixed effects regression. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS		IV	
	(1)	(2)	(3)	(4)
Panel A: Dependent Variable – *CAPEX+R&D*				
IO_FOR	0.030***	0.012**	0.096***	0.040
	(0.005)	(0.005)	(0.017)	(0.041)
IO_DOM	0.031***	0.007	0.027***	0.006
	(0.006)	(0.008)	(0.007)	(0.006)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.18	0.61		
Number of observations	131,056	129,053	131,056	129,053
Panel B: Dependent Variable – *EMPLOYEES*				
IO_FOR	0.937***	0.581***	5.960***	3.351***
	(0.097)	(0.062)	(0.455)	(0.512)
IO_DOM	0.854***	0.512***	0.588***	0.469***
	(0.070)	(0.062)	(0.104)	(0.056)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.77	0.96		
Number of observations	121,095	119,107	121,095	119,107
Panel C: Dependent Variable – *PATENTS*				
IO_FOR	0.637***	0.145	6.465***	3.673***
	(0.076)	(0.110)	(0.880)	(1.274)
IO_DOM	-0.235***	-0.108	-0.624***	-0.131
	(0.061)	(0.109)	(0.153)	(0.144)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	No	Yes	No	Yes
Industry fixed effects	Yes	No	Yes	No
Country fixed effects	Yes	No	Yes	No
R^2	0.24	0.82		
Number of observations	132,834	28,227	132,834	28,227

Table IA.6
Foreign Institutional Ownership and Long-Term Investment: Robustness

This table shows the results of firm-level panel OLS regressions of long-term investment on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the sum of capital expenditures and R&D expenditures (*CAPEX*+*R&D*) as a fraction of assets. The regression for column (1) restricts the sample to the 2005-2010 IFRS adoption period. In the regression for column (2), we control for country-industry-year fixed effects. In the regression for column (3), the dependent variable is the sum of capital expenditures and R&D as a fraction of sales. In the regression for column (4), the dependent variable is capital expenditures as a fraction of assets. In the regression for column (5), the dependent variable is R&D expenditures as a fraction of assets. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
IO_FOR	0.045***	0.041***	0.443***	0.019***	0.021***
	(0.006)	(0.006)	(0.047)	(0.003)	(0.004)
IO_DOM	-0.000	-0.000	0.149***	0.007***	-0.011***
	(0.003)	(0.002)	(0.015)	(0.001)	(0.002)
Year fixed effects	Yes	No	Yes	Yes	Yes
Industry fixed effects	Yes	No	Yes	Yes	Yes
Country fixed effects	Yes	No	Yes	Yes	Yes
Country-industry-year fixed effects	No	Yes	No	No	No
R^2	0.21	0.24	0.15	0.20	0.31
Number of observations	112,919	179,125	179,125	179,125	179,125

Table IA.7
Foreign Institutional Ownership and Innovation Output: Robustness

This table shows the results of firm-level panel OLS regressions of innovation output on institutional ownership using a sample of Worldscope non-financial and non-utility firms in the 2001-2010 period. The dependent variable is the logarithm of one plus the number of patents applied with the USPTO (*PATENTS*). In the regression for column (1), we restrict the sample to firms with at least one patent application in the sample period. In the regression for column (2), we restrict the sample to the 2001-2008 period. In the regression for column (3), we control for country-industry-year fixed effects. In the regression for column (4), the dependent variable is the logarithm of patent counts. In the regressions for columns (5)-(7), the dependent variable is the patent counts using a three-year rolling window, patent counts scaled by technological class and period, and patents counts three years in the future, respectively. In the regression for column (8), the dependent variable is the ratio of patent counts-to-R&D stock. In the regressions for columns (9)-(10), the dependent variable is the logarithm of one plus cite-weighted patent counts and the logarithm of one plus the number of patents applied simultaneously with the three main patent offices (USPTO, EPO, and JPO), respectively. Column (11) shows the results of a Poisson regression of innovation output (patent counts) on institutional ownership. Regressions include the same control variables as in Tables 4-6 (coefficients not shown). Variable definitions are provided in Table A.1 in the Appendix. Robust standard errors adjusted for country-year level clustering are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
IO_FOR	1.300***	0.704***	0.629***	1.286***	0.826***	0.796***	0.641***	0.150***	0.639***	0.379***	1.935***
	(0.181)	(0.100)	(0.091)	(0.214)	(0.109)	(0.105)	(0.101)	(0.019)	(0.094)	(0.056)	(0.190)
IO_DOM	0.280***	0.352***	0.348***	0.253***	0.474***	0.402***	0.319***	-0.021***	0.378***	0.151***	0.611***
	(0.058)	(0.043)	(0.045)	(0.075)	(0.072)	(0.042)	(0.056)	(0.006)	(0.069)	(0.031)	(0.036)
Year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-industry-year FE	No	No	Yes	No	No	No	No	No	No	No	No
R^2/Pseudo R^2	0.30	0.29	0.31	0.34	0.31	0.26	0.28	0.04	0.27	0.20	0.60
Number of observations	48,096	143,463	181,173	24,815	181,173	181,173	120,532	85,370	181,173	181,173	181,173