Foreign Rivals are Coming to Town:
Responding to the Threat of Foreign Multinational Entry[*]

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Abstract

How do domestic firms respond to the *threat* of foreign competition? This paper quantifies the threat of foreign competition by exploiting news of potential foreign multinational investments appearing in over 35,000 newspapers, business presses, magazines, newswires, and other forms of media in 200 countries. Using unique time-variant firm-specific measures of foreign multinational threat, the analysis shows that domestic firms respond to the threats by upgrading productivity, raising innovation, investment and wage rate, and altering product composition. However, the responses exhibit substantial heterogeneity across firms: the right tail of the productivity distribution responds by increasing innovation while the left tail escapes threats by dropping products, leading to a U-shape relationship between initial productivity and productivity growth. Actual multinational competition, in contrast, leads to product dropping only. These previously unexplored responses to the threat of foreign competition constitute an economically important source of gains from globalization and convey new implications for the timing, evolvement, and form of industrial, trade and investment policies.

JEL Codes: F1, F2, L2, D2
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1   Introduction

How do domestic firms respond to the *threat* of foreign competition? An extensive body of research assesses the impact of competition from globalization on the productivity and organization of domestic firms, emphasizing the market reallocation or spillover effects of actual foreign competition. But relatively little analysis has investigated the response of domestic firms to the threat of foreign competition, a distinctively different mechanism through which domestic firms could be influenced by globalization. A central challenge in investigating this mechanism—as distinct from how domestic firms respond to actual foreign competition—is the difficulties of identifying the threat separately from actual competition.[1]

In this paper, we examine domestic firm responses to the threat of foreign multinational competition. We quantify multinational competition threats by exploring news of potential multinational firm investments from over 35,000 newspapers, business presses, magazines, newswires, television and audio transcripts, and web and social media in 200 countries in 2000-2007. We identify and collect foreign direct investment (FDI) news by searching in Factiva, the largest global digital business intelligence in the world. For each piece of news, we record the publishing date of a potential foreign investment to record the time at which a threat emerges. We also document detailed characteristics of each potential investment (when available)—such as expected investment size, expected output and employment, investment motive, and entry form—and characteristics of each news—such as news content and publisher information—by carefully reading the text of each news and extracting related information.

Exploring this unique data, we examine how domestic firms behave when faced with the threat of foreign multinational competition. For example, an October 2007 news article in *Shanghai Daily* reported that Continental AG plans to "invest US$216 million to build its first Chinese tire-making plant in Hefei, Anhui Province... The new facility, awaiting approval from the central government, will be able to produce four million passenger tires a year in the long term... Construction will start in the middle of next year and production is due to begin in early 2010." In another example, an automotive online news portal (just-auto.com) published an article noting that "Goodyear is reportedly considering plans to invest in a new tyre production plant in Yaroslavl region north of Moscow. According to local media reports, Goodyear executives met with the regional governor in the Yaroslavl region in April to discuss a land acquisition for the new plant. Goodyear has reportedly also asked Russian president Dmitry Medvedev to provide the company with incentives to support the project." The newspaper also noted that Goodyear's plans are likely to meet with resistance down the road from local tire

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[1]How entry threat affects incumbent firm innovation and productivity is a topic of considerable theoretical and policy debate (see, for example, Aghion et al., 2005; 2009). A central empirical issue widely noted in the literature (e.g., Aghion et al., 2009) is that entry threat is usually unobservable and cannot simply be proxied by actual entry. One of the main reasons is that actual entry deviates from entry threat systematically when entrants may lose against incumbents; as a result, whether entry threat will eventually become actual entry and the ultimate impact of actual entry are largely dependent on how incumbents respond to entry threat.

makers. These news enables us to quantify threats of foreign multinational entry and identify a unique time window between the news and the occurrence of foreign competition (if foreign competition actually occurs). Investigating domestic firm behavior during this time window—when product and factor markets have not been exposed to actual foreign competition—allows us to distinguish firm responses to foreign competition threats from the potential market reallocation and spillover effects of actual competition.

We merge the constructed foreign investment news data with a large cross-country firm panel dataset drawn from Bureau van Dijk's Orbis and Chinese National Bureau of Statistics' (NBS) Annual Census of Enterprises. The cross-country firm panel dataset contains rich time-series financial, operation, and ownership information and enables us to assess domestic firms' reactions to anticipated as well as actual foreign multinational competition in a variety of dimensions including not only productivity but also innovation, investment, wage, and product composition decisions. We construct a time-variant firm-specific measure of foreign multinational competition threats as well as a time-variant firm-specific measure of actual foreign multinational competition by linking city-industry-year specific foreign investment news and actual foreign investments to each domestic firm based on the firm's initial product composition. This measure enables us to explore within-firm variation in exposure to foreign multinational threats as well as actual foreign competition and control for all time-variant city-industry-specific shocks and trends with a city-industry-year fixed effect and all firm-specific factors with a firm fixed effect. To further account for unobserved investment-related trends and shocks, we also quantify and include news of investments by domestic firms similarly at the firm level.

Our analysis shows that domestic firms respond significantly to the threat of foreign multinational competition. Domestic firms upgrade productivity when faced with the threat of foreign competition and the degree of productivity upgrading increases with the size of threats measured by either the expected investment value or the expected employment. In exploiting the underlying mechanisms of productivity response, we find that domestic firms significantly raise innovation, investment and wage rate after the arrival of foreign competition news. In addition, we find domestic firms undertake significant product composition adjustments in reaction to the threat of foreign multinational competition. Domestic firms are more likely to drop products and switch primary products when exposed to foreign multinational competition threats. The arrival of actual foreign multinational competition, in contrast, is shown to have an insignificant effect on productivity and leads to product churning only. The insignificant productivity effect of actual FDI echoes the overwhelming existing evidence finding actual FDI to exert little or even a negative productivity effect on domestic firms including, among many others, Aitken and Harrison (1999), Javorcik (2004), Guadalupe et al. (2012), Fernandes and Paunov (2012), Carluccio and Fally (2013), and Fons-Rosen et al. (2013).[2] This finding is often attributed to the two opposing ways in which actual FDI competition could influence domestic firm productivity,

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[2]We discuss related literature in detail below.

including a positive productivity spillover channel and a negative market reallocation channel.

Our analysis further shows that responses to foreign multinational threats exhibit substantial heterogeneity across firms, industries, and countries. Within each country and industry, firms at both the right and the left tails of the TFP distribution upgrade TFP, while firms in the middle do not change productivity significantly. But the mechanisms of productivity upgrading are sharply different for the right and the left tails of the distribution. The most productive domestic firms—those closest to the productivity frontier—improve TFP by increasing innovation, while the least productive domestic firms—those furthest behind the frontier—enhance TFP by dropping and switching products. Domestic firms in the middle range of the productivity distribution do not exhibit significant TFP responses. Incorporating a unique dataset from Orbis that reports top direct competitors of MNCs, we also investigate how news of an MNC's new FDI activity (e.g., Toyota's new investment in China) might affect the behavior of the MNCs' top competitors, most of which are MNCs themselves (e.g., GM's existing subsidiary in China) and show that top competitors respond to the news by increasing local advertising expenses rather than innovation. Further, we find single-plant firms and firms that only sell or operate domestically respond more strongly to foreign competition threats. Across industries, domestic firms in industries with more "neck-to-neck" competition and a more left-skewed productivity distribution are more responsive to foreign multinational threats. Across countries, domestic firms in developed countries are found to react more to FDI news while FDI news from developed countries are also found more influential.

Given our goal to establish the role of information in firm behavior, we also explore the detailed content of each news to extract useful information contained in each news report and examine how domestic firms' reactions might vary with the specific information provided. We find that the substance of the news significantly affects domestic firms' behavior. First, we identify whether the news contains information on the credibility of threats by revealing any uncertainty or ambiguity (such as contingencies on government approval) about the foreign investments. Domestic firms are shown to respond more to more credible foreign multinational threats whose investments are described with less ambiguity. Second, we record the position in each news, measured by the paragraph number, where information of the investment was first provided. We find that domestic firms respond more strongly to information reported earlier on.

In the analysis, we account for all time-variant city-industry specific factors and time-invariant firm attributes using a city-industry-year fixed effect and a firm fixed effect to address the possibility that either FDI news or actual FDI might be driven by local industry-specific or firm-specific shocks. We also include firm-specific domestic investment news to control for factors that might be correlated with the reporting of investment news or actual investments. However, to further establish the robustness of the results we pursue several additional strategies. First, we consider a series of placebo tests by exploiting the specific timing of FDI news

and assuming that each FDI news had been published slightly earlier or later. If FDI news indeed capture local or domestic-firm-specific productivity and economic trends or simply reflect actual FDI trends, the slight backward or forward adjustment in the timing of news should lead to relatively little changes in the estimated effects of FDI news. If, instead, the concern does not apply, FDI news, when assumed to have been published before the actual publication date, should not result in any responses from domestic firms; similarly, when assumed published after the actual publication date, the aged FDI news should result in little or more moderate reactions. Our placebo tests show that domestic firms do not react to the placebo news.

In addition, we consider two alternative instrumental variable (IV) approaches. First, we isolate a subset of news articles that briefly touch upon, but do not center on, foreign investment issues. Specifically, we consider weekend narrative news on broad topics which meet the following criteria: (i) the title of the news is not FDI related (e.g., does not contain any words related to investment); (ii) the articles were narrative and published over weekends. FDI news in this category are usually a relatively minor and subtle part of a long narrative article discussing non-FDI-specific topics. Weekday FDI news, in contrast, usually highlight FDI in the headlines and devote most, if not all, of the content to describing the investment. Compared to weekday FDI news which tend to cater to readers with strong business interests and orientations, narrative weekend news tend to cater to broader, general-interest audiences with preferences for a lighter business content. The probability for weekend narrative news to be driven by unobserved domestic firms' productivity shocks (given that we already control for all city-industry-year specific shocks and firm fixed effect) is therefore low. We find that the estimated effect of weekday FDI news is positive and robust to the IV.

In a second strategy, we exploit the interdependence between FDI news and other news categories, which are unlikely to be correlated with individual domestic firms' productivity shocks, in the supply decisions of news media. For example, the volume of FDI news could be influenced by domestic political news with readers' interests in globalization (including FDI) issues rising during political debates. Conversely, FDI news (and economic news in general) could be crowded out by sports news, as readers' interests in those issues subside during sports events. These interactions, confirmed in the data, provide us relatively exogenous sources of variation in FDI news, thereby allowing us to provide an additional robustness check of the results.

Finally, we perform several additional data-related checks. For example, we investigate the potential concern of large FDI news bias and address the implications of this issue for our analysis. Specifically, we show that there are low correlations between the scale of FDI reported in the news and the amount of media attention. We also re-perform our analysis by separately considering either small-scale FDI news or large-scale or news-reported actual FDI and find the results to be qualitatively similar. We also focus on countries with comprehensive news coverage—to account for the potential bias of large news publications—and countries with the

best domestic-firm coverage—to mitigate the concern of large- and medium-firm bias—and find the results to remain robust.

In establishing the magnitude of the economic impact of FDI news, we show that in 2001-2007 responses to FDI threats account for 5 percent of firm productivity growth across all sample countries and 10 percent of firm productivity growth in developing nations while actual FDI does not contribute net productivity gains. These estimates are comparable to the estimated firm productivity gains from (actual) foreign competition that have been documented in the literature, suggesting that responses to the threat of foreign multinational competition constitute an economically important mechanism through which foreign multinational competition could affect domestic firms and represent a source of productivity gains that could be equally important as the effects of actual foreign competition due to either FDI or trade liberalization.

The results have direct implications for the policy debate on industrial policy, foreign investment deregulations, and trade liberalization. Not only are complementary industrial policies likely needed to help foster the innovation and productivity responses of domestic firms, these policies should not be delayed until after actual foreign competition occurs, but should instead be introduced as soon as the threat of foreign competition emerges. The specific form of the policies should also evolve over time with the development of foreign competition threats as domestic firms respond differently at different stages of competition. Further, the finding that firms closest to the productivity frontier respond to the threat of foreign competition differently than firms farthest behind the frontier as well as firms in between suggests that differential policy interventions as well as policies to facilitate resource reallocation might be demanded.

Our paper is directly related to a broad empirical trade literature examining the economic effects of foreign multinational competition. A comprehensive review of this literature is beyond the scope of our paper; we focus instead on most related areas. First, an extensive literature evaluates the effect of FDI on domestic firm productivity through productivity spillover. Overwhelming evidence suggests positive productivity spillovers between industries with vertical production linkages, but little or weak within-industry productivity gains. The seminal work by Aitken and Harrison (1999) uses a panel data of Venezuela plants and finds that FDI negatively affects the productivity of domestically owned plants. Javorcik (2004), which has spurred many studies to explore productivity spillover through vertical production linkages, shows that in Lithuania multinational production generates positive spillovers via backward production linkage but little effects on the productivity of domestic firms in the same industry. Fernandes and Paunov (2012) examine the effects of FDI in services on manufacturing productivity growth in Chile and again find relatively weak evidence for horizontal spillovers. Guadalupe et al. (2012) account for the endogenous acquisition decisions of foreign multinational firms and find that in Spain while foreign ownership leads to productivity improvement in acquired plants, it raises productivity dispersion within the industry. Carluccio and Fally (2013) examine how productivity spillovers via backward linkages depend on technological incompatibilities between foreign

and domestic technologies and show robust evidence of positive vertical spillovers and evidence of negative horizontal spillovers in the case of developing countries and neutral or positive horizontal spillovers in the case of developed economies. Most recently, Fons-Rosen et al. (2013), similarly using cross-country data, find the productivity impact of FDI to be either insignificant or relatively small, mostly between related industries within the same sector. One of the few exceptions is Keller and Yeaple (2009) who examine imports and FDI to U.S. manufacturing firms in 1987-1996 and show that both imports and FDI lead to productivity gains for domestic firms in the sample considered.[3]

In addition to the literature on FDI and productivity, several studies evaluate the impacts of FDI on labor and capital markets. For example, Aitken, Harrison, and Lipsey (1996) investigate the impact of foreign-owned plants on the wages of domestically owned establishments in Mexico and Venezuela and report an increase of industry wages due to foreign multinational production. Similarly, Feenstra and Hanson (1997) find a higher level of maquiladora activity to lead to a higher share of total wages going to skilled (nonproduction) workers in Mexico, interpreting their result as increased competition for skilled labor from foreign multinational firms. Exploring the effect of multinational production on domestic financial markets, Harrison and McMillan (2003) find that the presence of foreign firms exacerbates domestic firms' credit constraints. Alfaro and Chen (2015) use a cross-country firm-level panel dataset and find significant evidence of market reallocation due to foreign multinational competition, accounting for the majority of aggregate productivity gains.

The above strands of literature shed important light on the ex-post effects of foreign multinational competition on domestic firms stressing, in particular, two main mechanisms. First, increased access to foreign firms could generate positive productivity spillovers, via, for example, direct technology transfer, labor mobility, and higher-quality intermediate inputs (a spillover channel). Second, increased foreign multinational competition could result in market reallocations in final-good as well as factor markets from domestic firms to foreign competitors and from less efficient to more efficient domestic firms (a market reallocation channel).

However, there is a third and least stressed channel through which foreign multinational competition could influence the productivity and organization of domestic firms: domestic firms

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[3]In contrast to the ambiguous link that has been documented between FDI and domestic firm productivity in the same industry, a separate strand of literature shows that trade liberalization could have an unambiguously positive effect on domestic firm productivity through channels including export market access, import competition, and imported intermediate inputs. The pioneering work by Pavcnik (2002) uses Chilean plant-level panel data and shows significant within-plant productivity improvements as well as market reallocations following Chilean trade liberalization. Lileeva and Trefler (2010) investigate the effect of U.S. tariff cuts on Canadian plants' export and productivity growth and find lower-productivity Canadian plants that were induced to export by the tariff cuts tend to increase labor productivity and product innovation. Examining the impact of MERCOSUR, Bustos (2011) shows that Argentinean firms in industries facing higher reductions in Brazil's tariffs upgrade technology faster. Topalova and Khandelwal (2011) exploit India's externally-imposed trade reform and find that both pro-competitive forces due to lower final-good tariffs and access to foreign inputs due to lower input tariffs increase firm productivity. Bloom, Draca and Van Reenen (2015) investigate the impact of Chinese import competition and find that productivity increases among European firms that are most affected by Chinese imports.

could respond to the threat of foreign multinational competition by undertaking strategic actions and upgrading productivity with the aim to escape competition (a threat channel). In contrast to the extensive literature on the productivity spillover and market reallocation effects of FDI, little analysis has investigated how domestic firms respond to the threat of FDI. Unlike the spillover and market reallocation channels, responses to the threat of foreign multinational competition can arise as soon as the threat emerges—without the presence of actual competition—and when final-good and factor markets have not been exposed to actual foreign competition and the demand, supply and prices of final goods and factors have not changed. The motive of these responses is also distinctively different. Responses to the threat of foreign competition are aimed to strengthen domestic firms' own competitiveness and to either deter foreign rivals or weaken their competitiveness after entry. Consequently, these responses could ultimately alter the economic impacts, including the productivity spillover and market reallocation effects, or even the occurrence of actual FDI. However, because it is difficult to identify threat separately from actual competition and pinpoint when the threat of competition arises, there is little existing evidence on whether and how domestic firms strategically respond to the threat of foreign multinational competition and how the responses differ from the effects of actual competition.

Our paper contributes to the literature by exploring a new approach to quantify the threat of foreign competition and investigating responses to these threats. We distinguish between the strategic actions of domestic firms and the spillover and the market reallocation effects of actual multinational competition and offer one of the first evidence on how foreign multinational threats could stimulate innovation, investment, product churning, and productivity growth even in the absence of actual competition. We show that the strategic, self responses to competition threats represent an under-emphasized, but crucially important mechanism through which globalization affects domestic economies; this mechanism, given the weak productivity effect of actual FDI, could constitute a central source of firm productivity gains from multinational competition that has not previously been accounted for. Further, exploring unique detailed characteristics of our primary treatment variable (such as the timing and location, the primary consumers, and the content of each FDI news) enables us to employ various strategies to identify the treatment effect. The findings presented in the paper convey important implications on how the impact of foreign competition evolves—and consequently the design of economic policy should as well—at different stages of competition. The findings suggest that it is essential to take into account domestic firms' strategic responses to the threat of foreign competition when evaluating the aggregate gains from foreign competition.

The rest of the paper is organized as follows. Section 2 discusses theoretical hypotheses emerging from existing theories. Section 3 describes the methodology and process used in constructing the foreign investment news dataset and the information as well as the patterns embodied in the data. Section 4 discusses the supplementary cross-country firm-level financial,

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ownership, and operation data. Sections 5 and 6 report the baseline econometric evidence and the sensitivity analysis, respectively. Section 7 concludes.

2 Theoretical Hypotheses

An extensive number of studies offer theoretical rationales on how domestic firms should respond to the threat of foreign competition, specifically, through innovation and product composition decisions. In this section, we briefly describe these theories and their respective predictions.

2.1 Innovation

First, theoretical studies show that the threat of competition affects the innovation incentive of incumbent firms. Aghion et al. (2009), for example, shows that the threat of entry affects the innovative effort of incumbent firms. The paper predicts that a higher threat of technologically advanced entry should encourage innovation by incumbents in sectors that are initially close to the technological frontier, with the aim to escape entry and competition. Incumbents that are further behind the frontier, in contrast, have no hope to win against a potential entrant and therefore the effect of an increased entry threat is to reduce the incumbents' expected payoff from investing in R&D. The paper also predicts that the effects of entry threat on incumbent productivity growth in sectors near and further behind the technological frontier should mirror the heterogeneous pattern of entry effects on innovation incentives.

Innovation responses to the threat of competition are particularly essential in the context of foreign competition. As established in Melitz (2003) and Helpman, Melitz and Yeaple (2004), foreign firms participating in international activities, including both foreign exporters and foreign multinational firms, are generally more productive than average domestic firms. Preemptive actions like increased innovation thus could be especially important for helping domestic firms gain cost advantages, survive, and better compete with foreign rivals after the foreign rivals actually arrive and ultimately influence the economic impacts of actual foreign competition.

2.2 Product Composition

The threat of foreign competition could also affect domestic incumbent firms' product composition decisions and result in within-firm reallocation and subsequently productivity improvement. Several studies—including, for example, Bernard, Redding and Schott (2010), Eckel and Neary (2010), Mayer, Melitz and Ottaviano (2014, 2015), and Nocke and Yeaple (2014)—investigate how trade liberalization could affect the product composition of multi-product firms and show that the threat of increased competition can motivate firms to change their product mix by dropping their least competitive products and specializing at their most competitive products. Their analysis suggests that product switching contributes to a reallocation of resources within firms toward their most efficient use and represents an important channel of productivity gain.

Bloom et al. (2013) develop a novel "trapped-factor" model of trade-induced innovation where firms can allocate a factor of production either to produce old goods or innovate and produce new goods. Increased import competition reduces the profitability of old goods and consequently the opportunity cost of innovating and producing new goods, thereby increasing firms' incentives to innovate and introduce new goods.

The above product-composition responses also apply to the context of this paper. In anticipation of future competition from foreign multinational firms, domestic firms have strong incentives to drop their least competitive products or the products facing future competition before actual foreign competition occurs. Such changes in product composition could lead to an increase in the firm's overall productivity.

Our empirical analysis will incorporate the above theoretical literature and investigate how domestic firms respond to anticipation of foreign multinational entry through innovation and production decisions. We will also investigate—following the theoretical predictions—how the effects could vary across firms depending on each firm's distance to the productivity frontier, across industries depending on each industry's competition structure, and finally across countries.

3 Quantifying Foreign Multinational Threats

As described earlier, a central challenge in assessing firm responses to the threats of foreign competition is the difficulties of identifying foreign competition threats separately from actual foreign competition. It is widely noted in the literature that entry threat is usually unobservable and cannot be proxied by actual entry. Different from the effect of actual competition, responses to entry threat can arise before and without the presence of actual competition and actual demand and supply shifts in final-good, factor and input markets. These responses exhibit the strategic motive to deter future rivals or—when deterrence is unlikely—weaken the competitiveness of future rivals after their actual entry. Consequently, how incumbents respond to entry threat will directly determine whether entry threat will eventually lead to actual entry and the ultimate impacts of actual entry.

In this paper, we quantify threats of foreign competition by exploring news of potential foreign multinational investments. Compared to other types of international competition such as exports and imports, the foreign investment activity of multinational firms has always received considerably more media attention. Many newspapers, industry journals, and magazines closely monitor and report the latest news and rumors about multinationals' future investments. This offers us an opportunity to measure the threat of foreign multinational competition—through the channel of news.[4] In this section, we describe the source and the process used to construct

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[4] We recognize that FDI news is only one of the channels through which information about future multinational competition might dissipate across firms and countries. Information might also be transmitted through

a database of foreign investment news and the detailed information collected in the data.

3.1 Factiva

The primary source of our news information is Factiva, founded by Dow Jones and Reuters. Factiva is one of the largest global digital business intelligence aggregators and archives in the world. Factiva delivers the world's news and business information with access to more than 35,000 news sources, including newspapers, trade press, consumer magazines, newswires, press releases, television and audio transcripts, digital video and audio clips, web media, and social media, from 200 countries in 28 languages.[5] Top examples in each category include Wall Street Journal and the New York Times (newspapers); the Oil and Gas Journal and the Automotive News (trade presses); Dow Jones Newswire and AFP (newswires); PR Newswire and Business Wire (press releases); ABC News—Good Morning America and Deutsche Welle (TV and audio transcripts); WSJ Live (multimedia); Gazzetta di Parma Online News, L'Unione Sarda Online News, and Sina Corp (web media). Factiva's combination of global content, business search, and monitoring technologies offers users timely, reliable and relevant knowledge.

Two other sources, namely, LexisNexis Academic and ABI/Inform Complete Plus were also considered. LexisNexis Academic News, published by Reed Elsevier, gives access to major newspapers from around the world as well as industry and market news sources in 16 languages. Its main advantage, however, is access to U.S. and international law documents which are outside of our research interest. A comparison of Factiva and LexisNexis suggests that 84 percent of Factiva's news titles are unique and not covered in LexisNexis Academic News. Factiva has a more comprehensive coverage by including both major and local newspapers, industry journals, trade publications, and multimedia whereas LexisNexis Academic News focuses on major newspapers and law documents only. Similar to LexisNexis Academic News, ABI/Inform Complete Plus consists of primarily the largest publications specifically in the U.S. and Europe. Given our goal of collecting news information from not only prime but also local channels and from not only the U.S. and Europe but also other regions (especially developing countries), we adopt Factiva as the primary data source. In our final FDI news sample, only 33 percent of FDI news were collected from major (international or national) news publications and 51 percent of

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informal channels like business connections. However, compared to the informal channels, formal FDI news has several distinct advantages, namely, (i) a much broader audience coverage that includes people/firms without access to the informal channels; (ii) greater reliability and higher quality; and (iii) systematically available and quantifiable information. In contrast, information access through informal channels depends greatly on the extent of a person's/firm's informal connections and can be less reliable and accountable. More crucially, information transmitted through such channels is infeasible to quantify systematically. Further, we note that even if informal channels constitute an important source of business information, as long as business news promptly capture these information FDI news will still be a good proxy for the threat of competition, if not the channel through which information spreads. In cases of omitted information, our estimation results focusing on formal FDI news would likely be biased downwards.

[5]While Factiva is the largest business news archive in the world, its coverage still varies across countries. In Section 6.5, we examine the robustness of our analysis by focusing on countries with the most comprehensive news coverage.

FDI news were published in the U.S. and western Europe.

3.2   Methodology

The following specifications are employed in our data search process. A more detailed description of the data construction process is provided in the supplement Online Data Appendix. We limit the search to the period of January 1, 2000-December 31, 2007.[6] The search includes all types of sources, all regions, and companies in manufacturing industries including Food, Beverages, Tobaccos, Automobiles, Chemicals, Clothing and textiles, Computers, Electronics, machinery, telecommunications, and other industrial and consumer products.

Our data collection process proceeds in three steps. First, we collect all investment related news from Factiva by searching the string "invest" (as either a whole word or part of whole words such as "invested" and "investment") in the text (including headlines and lead paragraphs). The search results in 146,663 investment-related news articles, which constitute about 12 percent of all corporate and industrial news.

In the second step, we manually screen each article, in particular, the text around the keywords to identify news about possible future investments. Investment news with expressions such as "plan to", "agree to", "say they will", "sign an agreement", "expect", and "consider" when describing the investment activity were considered as news of future investments.[7] We also identify the companies involved in the investments and perform a background check on each company using business intelligence sources such as Hoover's to distinguish between domestic and foreign investments and to identify the headquarter country of each firm as most news articles do not indicate the source country of investments. The vast majority of news also do not report the stake share of the MNCs; those that do all report more than 10 percent. We separately record news of foreign multinational investments and news of domestic firm investments, the latter of which is included in the empirical analysis to control for local industry-specific investment shocks and trends. This step yields 20,432 pieces of foreign investment news.

In the third step, we collect detailed investment and news characteristics by carefully reading the text of each investment news. The main characteristics recorded are described in the next sub-section.

In a supplement Online Data Appendix, we describe in detail the data verification and audit procedures used to ensure the accuracy of the data.

3.3   Investment and News Characteristics

The following list of information is recorded about each piece of investment news. The first group is information about the potential investment and the second group includes characteristics of

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[6]The time frame is largely determined by the availability of firm-level financial data.

[7]The list of words discussing a future investment that we have come across is included in the Data Appendix. We also recorded news of current foreign investments and used the information as an alternate measure of actual FDI activity in the analysis to examine the robustness of the results.

the news itself.

Investment Information

1. *Multinational firm*: the firm that would undertake the foreign investment. We identify each firm's name, home country, primary industry, and ultimate owner (if the firm is a subsidiary of another firm). In most cases, only one firm engages in the investment. In cases where more than one firm is involved, each firm's information is recorded separately.

2. *Publishing date*: the date on which the news was published.

3. *Possible start year*: the potential production starting year.

4. *Investment country*: the country where the multinational firm might invest. There are 138 host countries in the final data.

5. *Investment state/province*: the state or province where the multinational firm might invest.

6. *Investment city/town*: the city where the multinational firm might invest. The city information is reported in most investment news. There are 2,463 cities in the final sample. In cases in which only investment states and provinces are reported, we use the largest city to proxy for investment city/town.

7. *Entry or expansion*: whether the potential investment is a new entry or an expansion of an existing investment.

8. *Investment industry*: the primary industry in which the subsidiary would operate. Based on the description in the news, we identify the 4-digit US SIC code of the industry and later aggregate it to the 3-digit level to merge with the financial data. In a relatively few cases where the industry information is not given, we search company information from other sources to identify the primary industry.

9. *Investment value and currency*: the expected amount of investment value and its currency. We convert all investment values to current U.S. dollars based on daily exchange rates.

10. *Expected employment, output, and revenue*: the expected employment, output, and revenue from the investment.

11. *Subsidiary name*: the name of the prospective subsidiary.

12. *Investment form*: whether the potential investment is greenfield, M&A, or joint venture.

13. *Investment contingency*: the contingency of the potential investment such as "*subject to government approval.*"

14. *Investment motive*: the motive of the potential investment such as "*to meet the local demand*" and "*to use it as an export hub.*" We separately identify local-market seeking FDI news and export-platform FDI news.

15. *Expected consumer market*: related to the investment motive, the targeted consumer market of the potential investment, namely, domestic or foreign market (and share of exports if available).

News Characteristics

1. *Publication title*: the name of the news source. Our final sample consists of 832 news sources from 67 countries.

2. *Publisher*: the publisher company of the news source.

3. *Publisher country*: the headquarter country of the news source.

4. *Publication location*: the location where the news was published.

5. *Word count*: the number of words in the news text.

6. *Type of news sources*: the type of news sources. Our final sample consists of four major types of news sources, including newspapers, journals, and magazines; news agency or news service; website; broadcast. The majority of news sources are the former two.

7. *Circulation*: the circulation volume of the publication. For newspapers, journals, and magazines, we separately collect circulation data to measure their influences. The circulation data are obtained from Ulrich: Global Periodicals, News bank: Access World News, and Audit Bureau of Circulations.

8. *Online*: whether the publications have an online version.

9. *Frequency*: the annual frequency of publications.

10. *News agency reputation*: whether the news agency is an established national or international news agency.

3.4 Foreign Investment News: Stylized Facts

Our final sample consists of 20,432 pieces of foreign investment news. In this sub-section, we describe a number of stylized facts that emerge from the patterns of foreign investment news.

3.4.1 News Composition

We proceed by examining the composition of FDI news in several dimensions. First, we show in Figures 1 and 2 that host countries appearing most frequently in the FDI news include China, India, Russia, the United States, and Thailand and top industries include transportation, electrical products, chemicals, computer, and food. We also find that 56 percent of FDI reported in the news was expected to occur from OECD countries to non-OECD countries and about 30 percent of FDI was expected to occur between OECD countries. Among multinationals that most frequently appear in FDI news are Siemens, Toyota, LG, Volkswagen, Nestle, Honda, GM, BASF, Hong Hai Precision, and Samsung, as seen in Figure 3.[8]

[Figures 1-3 inserted here]

Second, we examine the investment motive reported by the news. Based on the news description, we identify three main types of motive—local market access (FDI seeking to serve

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[8]Figure 3 reports the total count of FDI news pertaining to an MNC, including both entry and expansion news, unique and duplicate news. The top MNC list by the size of announced investments is different.

local markets), export-platform (FDI seeking to serve export markets), and comparative advantage (FDI seeking lower production costs)—for news with available information. As shown in Table A.1, the three investment motives constitute, respectively, 39, 59, and 8 percent of total FDI news.[9] The composition of investment motive, specifically the concentration of FDI news in export-platform and comparative advantage FDI, is consistent with the observation that North-South FDI accounts for over half of the news.

Third, we consider investment forms, including greenfield, mergers and acquisitions (M&As), and joint venture. We show in Table A.1 that greenfield FDI, M&As, and joint venture account for, respectively, 68, 7, and 14 percent of FDI news.[10] The low share of M&As in the data is likely due to the fact that news of M&As, even though often in the form of rumors, are usually reported either on the day or a few days before the deals are completed. According to Zephyr, a database reporting M&A news (along with IPO, private equity and venture capital news), 70 percent of the cross-border M&A news concerns completed M&A deals; 30 percent of the news is M&A rumors. However, even when rumors are circulated before the formal announcement, the time lag between rumors and formal announcements is usually very short. According to Zephyr, the average time window between a rumor and a completed deal is 28 days, leaving very little preparation time for domestic firms. In contrast, greenfield FDI is usually reported well in advance, with an average of 25 months, of the expected actual investment, allowing domestic firms significant time to react to the news.

Fourth, we consider the size distribution of potential investments and find large variations. While the maximum expected investment value and the maximum expected output are over $100 billion and 80,000, respectively, the minimum investment value is less than $1,000 and the minimum expected employment is 8. The average expected investment value and expected employment are $355 million and 1,508, respectively.[11] Across industries, lumber, printing and allied products, and chemicals have the lowest average expected employment, while leather, food, and electronic components have the highest average expected employment.

Finally, we separate FDI news described with certainty from those that reveal uncertainty or ambiguity about the foreign investment. We define uncertainty in several ways, including, for example, investments with reported contingencies (government approval, broad-of-directors approval, and so on) and investments described with phrases such as "could invest", "want to invest", "may invest", "expect to invest", "intend to invest", and "consider to invest".[12] We consider threats of FDI involving uncertainty to be less credible than the others. As reported in Table A.1, we find that investments described with uncertainty account for about 48 percent of

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[9]Note that the three types of motive are not mutually exclusive in the data. Compared to information on expected markets which is reported by most news, information on cost motives is more limited. Examples of texts that describe each of these motives are provided in the Data Appendix.

[10]These three forms of FDI do not add up to 1 as the form is not described in some news.

[11]In Section 6.5, we investigate the potential concern of large FDI news bias and address its implications for our analysis.

[12]See the Data Appendix for more details.

total FDI news. It is worth noting even FDI news that are "confirmed" or provide a clear start date could still be subject to changes down the road, as we observe below.

3.4.2 News versus Actual FDI

Now we compare the data of FDI news with the data of actual FDI obtained from two different sources, namely, Orbis and UNCTAD.[13] To identify actual entry of foreign multinational firms, we explore the birth year of each foreign multinational establishment reported in Orbis. Identifying entry based on establishment dates offers a more accurate account of entry than counting foreign multinational subsidiaries newly appearing in the dataset because of data censoring and churning issues. According to the data, 21,930 new foreign multinational subsidiaries were established in 92 host countries and 149 manufacturing industries in 2000-2008.

As shown in Figure 4, we find a positive and significant correlation (around 0.4) between FDI news and actual FDI at the aggregate host-country level, based on either Orbis or UNCTAD. The correlation is lower when we compare FDI news with actual FDI at the city, industry, or the city-industry pair level. This suggests that there exist significant variations in the patterns of FDI news and actual FDI. FDI news in some countries, cities, and industries attract disproportionately high media attention. For example, China and India are two host countries that appear in FDI news more frequently than in actual FDI.[14] The different patterns of FDI news and actual FDI offer us an important source of variation for establishing their respective effects on domestic firms. The correlation between FDI news and actual FDI, as shown in Figure 5, rises to 0.7 at the aggregate headquarter-country level, suggesting less variation in the headquarter-country dimension and that countries with more outward FDI news also tend to engage in more actual FDI overseas. Two exceptions are the U.S. and Japan, which attract considerably greater media attention than suggested by the levels of their actual FDI.

[Figures 4-5 inserted here]

To interpret the correlations and understand the underlying factors, we take a closer look at the comparison. First, we consider medium and large investments and find that the correlations between FDI news and actual FDI are only slightly greater for investments with over $1 million value or 100 expected employee, rising to 0.5 at the host-country level. In fact, the correlations for top investments (for example, investments with over $10 million value or 500 expected employee) are found not necessarily higher than the correlations for medium investments.

Second, as shown in Figure 4, certain FDI host countries such as China and India appear in FDI news much more frequently than in actual FDI while some countries such as Germany and Romania are less frequently reported than shown in actual FDI. Similarly, certain headquarter

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[13] In Section 4, we discuss the data sources for actual FDI in detail.

[14] The media attention bias towards China and India was present not just in FDI news but also in general news reporting. As a robustness check, we excluded China and India from the analysis and found the results remain similar.

countries such as the U.S. and Japan are reported much more frequently in the FDI news than in actual FDI while some headquarter countries like Italy appear less frequently in the news than suggested by their actual FDI. In terms of bilateral country distribution, 56 percent of FDI news involve North-South FDI—occurring from OECD to non-OECD nations—while only 30 percent of actual FDI are North-South. In contrast, North-North FDI—FDI between OECD countries—accounts for only 30 percent of FDI news, but 53 percent of actual FDI. This suggests that North-South FDI tends to receive more attention in the media than FDI between developed nations. Relating FDI news with country characteristics, we show in Figure 6 that countries with greater GDP and higher GDP and GDP-per-capita growth rates tend to be reported more frequently by the news whereas no significant correlation is observed between FDI news count and countries' GDP per capita. Across industries, FDI news tend to be more concentrated in capital intensive and skilled-labor intensive industries such as Motor Vehicles and Motor Vehicle Equipment, Communications Equipment, and Electronic Components and Accessories than actual FDI.

[Figure 6 inserted here]

Third, we track the reported FDI activities in Orbis based on the MNC name, investment city, industry, and expected start year of production. We find that around 60 percent of foreign multinational entry described in the news can be matched with the Orbis data, suggesting that a large share of FDI news are likely not materialized. We performed a check on the FDI news that were not identified in the actual subsidiary data and found numerous anecdotal evidence confirming many of these news was indeed not realized in the end.

Fourth, we compare the distributions of expected investment size and actual investments. As seen in Panels A-C of Figure 7, we find that the expected employment and investment size tend to exceed the actual materialized employment and investment; while expected output tends to be lower than actual output. In Panels D-F where we demeaned the data, we also find the distributions of expected employment, output, and investment tend to be more concentrated than the distributions of actual employment, output, and investment. These patterns suggest that FDI news tends to over-estimate or over-report the scale of the investment and job creation, but is relatively conservative about output.

[Figure 7 inserted here]

4   Cross-country Firm Financial and Operation Data

We merge the investment news dataset with a cross-country firm-level financial and operation data. The datasets and the related firm financial and operation data are described next.

4.1 Firm Data Sources

Orbis   Orbis, published by Bureau van Dijk, is a leading source of company information and business intelligence, containing comprehensive financial, operation, and ownership information for public and private companies in over 100 countries. Orbis combines information from around 100 sources and information providers. Primary sources include Tax Authorities, Ministry of Statistics, Provincial Bureau of Legal Entities, Securities and Investments Commissions, National Banks, Municipal Chambers of Commerce, and State Registry of Accounts. Over 99 percent of the companies included in the database are private. The database reports at the firm level: (i) detailed 10-year financial information including 26 balance sheet items such as total asset, fixed asset, current asset, long-run investment, and total liability and income sheet items such as total revenue, value added, material cost, labor cost, and profit; (ii) industries and activities including primary and secondary industry codes in both local and international classifications; (iii) corporate structure including board members and management; and (iv) ownership information including shareholders and subsidiaries, direct and indirect ownership, ultimate owner, independence indicator, corporate group, and all companies with the same ultimate owner as the subject company.

Orbis provides several unique advantages that are central to our analysis. First, the financial and operation data in Orbis consist of a rich array of time-series information, enabling us to examine firm responses over time in, for example, total factor productivity and product composition. Second, a notable strength of Orbis is its ownership information, which covers over 30 million shareholder/subsidiary links and is known for its scope and accuracy. The information is collected from a variety of sources including official registries, annual reports, research, and newswires. The data show full lists of direct and indirect subsidiaries and shareholders, a company's degree of independence, its ultimate owner, and other companies in the same corporate family. We explore the ownership information to identify actual multinational activity across countries and compare the effects of anticipated and realized foreign investment. Third, Orbis contains a cross-country panel dataset of patent applications and citations including information on the date and location, the inventor, and the outcome of patent applications as well as citations between patents. This information enables us to explore firm patenting activities as a proxy of innovation responses. Fourth, Orbis reports top direct competitors for a subset of firms, most of which are multinational firms. We exploit this information to assess how FDI news affect the behavior of global competitors differently than average domestic firms.

While we believe that Orbis is a very informative and useful data source for answering the question raised in our paper, we are aware of its limitations. Like most other datasets that rely on public registries and proprietary sources, Orbis does not cover the population of businesses across countries. An ideal alternative would be national census data that include the entire population of firms. However, such census data are either hard to obtain (usually subject to location and nationality restrictions and requirements) or non-existent in many developing

countries due to high costs and institutional restrictions that prevent frequent collections of economic census for all the businesses in a country.[15]

To assess the extent of coverage, in particular, with respect to small businesses, we compare the data against several benchmarks including, for example, the OECD Structural and Demographic Business Statistics (SDBS) and the U.S. Census. We find Orbis provides satisfactory coverage in many countries considered. For France, for example, the SDBS dataset reports that 84 and 91 percent of the enterprises have fewer than 10 and 20 employees, respectively, in 2007 while Orbis reports 80 and 86 percent, respectively. The coverage for some countries such as Norway and Sweden, SDBS reports that close to 88 and 93 percent, respectively, of the enterprises have fewer than 20 employees, while Orbis shows 85 and 95 percent, respectively. For some other countries, Orbis tends to have a lower share of small firms. For Spain and Portugal, for example, the percentage of enterprises with fewer than 20 employees in SDBS is 91 and 89 percent, respectively, while in Orbis it is 80 and 77 percent. The SDBS data does not include data for developing countries, but the numbers in Orbis seem comparable for some of the countries. For Argentina, for example, the share of enterprises with fewer than 20 employees was close to 90 percent (with INDEC showing 82 percent for Buenos Aires). For Latvia, it was close to 78 percent in Orbis while Eurostat reports 85 percent. In Section 6.5, we further address the potential data coverage issue by re-performing our analysis for subsets of countries with the best data coverage.

Compared to the coverage of domestic firms which might be biased towards large and medium firms in some countries, multinational firms are well represented in Orbis. A firm is considered domestically owned if it is a stand-alone domestic firm or its majority ultimate owner is based in the same country, and foreign owned if its majority ultimate owner is based in a different country. To examine the coverage of the MNC establishment data, we compared Orbis with UNCTAD's Multinational Corporation Database. For the U.S. and other major FDI source countries, the two databases report very similar numbers of multinational firms, while Orbis contains more multinational establishments.

Chinese Annual Census of Enterprises As shown in Figure 1, China is the top host country in the news data accounting for over half of the FDI news. However, one of the key variables for estimating TFP, material cost, is largely missing in Orbis for Chinese firms. To overcome this issue, we obtain Chinese firms' financial and operation information separately from the Annual Census of Enterprises published by the Chinese National Bureau of Statistics (NBS). The Annual Census of Enterprises contains both state-owned and private manufacturing firms with sales above 5 million RMB, covering 95 percent of Chinese GDP as of 2007.

Similar to Orbis, the NBS data reports at the firm level: (i) detailed financial information including balance sheet and income sheet items such as total asset, fixed asset, current asset,

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[15]See Kalemli-Ozcan et al. (2015) for a comprehensive and detailed discussion of the Orbis database and instructions on the data gathering process.

long-run investment, total revenue, value added, material cost, labor cost, and profit; (ii) industries and activities including primary and secondary products; and (iii) ownership information including, for example, state ownership and foreign ownership. The financial data are converted to U.S. dollars based on yearly exchange rates to be consistent with Orbis and deflated using the deflator from LEUVEN. Compared to Orbis, however, the NBS data has a better coverage for Chinese firms especially in terms of material cost and investment information, allowing us to estimate TFP for Chinese firms. Further, the NBS data also reports additional information that is not available from Orbis but interesting to explore including, in particular, R&D expenditure. Even though the financial variables are defined with comparable definitions in Orbis and the Chinese NBS data, we perform the main TFP analysis—where we draw from both datasets—both jointly and separately for the two sources.

4.2 Key Variables

Our empirical analysis explores four main categories of firm-level information: (i) firm financial information including revenue, employment, fixed asset, material cost, and investment (sources: Orbis for non-Chinese firms and Chinese NBS for Chinese firms); (ii) product information including the 4-digit SIC codes of the primary and secondary products in which each firm produces (source: Orbis); (iii) patent application (source: Orbis); and (iv) R&D activity (source: Chinese NBS for Chinese firms only).[16] We describe in more detail below each of the key variables used in our analysis.

FDI Threat and Actual FDI First, we construct a time-variant firm-specific measure of foreign competition threat. We link city-industry-year specific foreign investment news to each domestic firm based on the firm's location and lagged SIC 4-digit product composition to compute the level of FDI threat facing each firm given the firm's unique product mix.[17] A key advantage of the firm-specific measure of FDI threats is that it enables us to explore firm-time-specific variation in exposure to FDI threat and control for all time-variant local industry-specific shocks with a city-industry-year fixed effect and all firm-specific shocks with a firm fixed effect.[18] Specifically, we have, for each firm, the set of SIC 4-digit goods the firm produces. We use this information (taken from the first available year or a lagged year) to construct the level of FDI threat each firm is exposed to given its products and location, measured by the unweighted average number of FDI news a domestic firm faces across its products. Similarly, we also measure the level of actual FDI competition and domestic investment news facing each domestic firm by matching the actual FDI entry data and the domestic investment news data with domestic

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[16]The final sample size and the number of countries included vary with the dependent variables examined. The sample size is the largest when the dependent variables consider product adjustments and patent applications, smaller when the dependent variable is TFP, and the smallest when examining Chinese firms only.

[17]In a similar spirit, Lileeva and Trefler (2010) construct a firm-specific measure of tariff cuts by linking the tariff-cut data to a firm's product data to compute the average tariff cut experienced by the firm.

[18]We also used the city-industry-year specific measure and found similar results.

firms' city and product code information.[19] Given that some FDI plans/projects are reported more than once in the news, we consider both counts of all FDI news (including duplicate news reporting the same FDI plan/project) and counts of unique FDI news.

TFP To measure firm productivity, we estimate production functions using firms' financial data in 2001-2007.[20] We estimate production functions separately for each country group and industry; five country groups, namely, high income, upper middle, middle, lower middle, and low income, classified following World Bank's definition are considered.

A key challenge in the measurement and identification of productivity relates to the endogeneity of the firm's optimal choice of inputs. Different estimation measures exhibit different advantages and limitations. As shown by Ackerberg, Caves, and Frazer (2006), the use of instruments based on lagged input decisions as the source of identification in structural estimation methods such as Olley and Pakes (1996) and Levinsohn and Petrin (2003) may be associated with collinearity problems.

We considered a variety of productivity estimation methodologies, including Olley and Pakes (1996), Levinsohn and Petrin (2003), Ackerberg, Caves, and Frazer (2006), and Gandhi et al. (2012). Gandhi et al. (2012), one of the latest developments, use a transformation of the firm's first-order condition for flexible inputs that does not require finding instruments for the flexible inputs or subtracting them from output. The transformation enables a nonparametric regression of the flexible input revenue share against all observed inputs to non-parametrically identify the flexible input's production elasticity and the ex-post shocks.[21] We further adapt the estimation code following de Loecker (2013) to include FDI news in the TFP law of motion. We report our primary results based on productivity estimates obtained using Ghandi et al.'s (2012) technique, but confirm as well that the estimated effects of FDI news are qualitatively similar when other estimation methods are used.[22]

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[19]We also considered the sum of FDI news across each firm's products and found similar results. We prefer the measure using the mean number of FDI news since the sum of FDI news could be correlated with firm characteristics such as firm size and product scope.

[20]In some countries such as China, the financial data are available for a shorter time period. When estimating the production functions, we deflated revenue, asset, and material cost with industry-level revenue, asset, and material-cost deflators obtained from a variety of sources including the EU KLEMS, OECD STAN, LEUVEN (China), and Taiwan national statistics. For countries without industry-level deflators, we used national income and capital deflators.

[21]We thank Amit Gandhi for kindly providing the program and refer the readers to the paper for more details about the technique.

[22]As in most empirical work that exploits productivity estimates, we do not observe firm-level physical output quantities and prices. This information is especially difficult to obtain for the large panel of countries considered in the paper. It is hence plausible that the productivity estimates are, to some extent, positively correlated with prices and markups. However, our prediction on the direction in which anticipated competition might affect prices and markups is opposite to the positive effect we show on productivity; competition threats should induce domestic firms to lower, instead of raise, prices and markups. Another potential concern is that the productivity measure might reflect product quality instead. To mitigate this concern, we re-performed our empirical analysis for relatively homogeneous goods and obtained largely similar findings.

Innovation and Product Adjustment   In addition to TFP, several other response variables measuring innovation, investment, wage and product composition are considered. Table A.2 reports the summary statistics and the sources of the main variables. A list of the key response variables is included below.

All firms:

1. *TFP (Orbis and NBS)*: the total factor productivity of a firm estimated based on Gandhi et al. (2012).

2. *Patent (Orbis)*: the number of patents applied for by a firm.

3. *Investment* (Orbis and NBS): the amount of long-term investment made by a firm.

4. *Wage* (Orbis and NBS): average labor cost per employee.

3. *Add product, drop product, switch primary product (Orbis)*: whether a firm adds a product, drops a product, and switches its primary product based on each firm's product code data.

Chinese firms only:

1. *R&D (NBS)*: an indicator of positive R&D expenditure.

2. *New product (NBS)*: an indicator of whether a firm reports introduction of new products.

Final Sample   After merging the firm-level data with the FDI news data, we have about 750,000 manufacturing firms from around 30 countries and 120 SIC 3-digit industries where there are both news and firm-level productivity data. In all country-industry-year cells, over 5 percent of the cells have positive FDI news and about 14 percent of the cells have actual FDI entry. The coverage of FDI news is mostly driven by industries as about one third of the industries do not have any news in the sample period while almost all countries appear in the news. At the firm level, 16 percent of the firms face at least one FDI news in their city and primary industry in 2001-2007, with the mean number of news being 0.6; 24 percent of the firms face at least one foreign multinational entry in their city and primary industry, with the mean number of entry being 0.4.

5   Main Empirical Analysis

In this section, we present our main econometric results on how domestic firms respond to foreign competition threats and actual foreign competition, respectively. We first present baseline productivity, innovation, investment, and product responses and then explore heterogeneous responses across firms, industries and countries and the magnitudes of the economic impacts.

5.1 Productivity

We start with the following baseline empirical specification:

$$
\begin{aligned}
y_{i,city,K,t} \;=\; & \alpha + \beta_1 FDI\ News_{city,K,t-1} + \beta_2 Actual\ FDI_{city,K,t-1} \qquad\qquad (1) \\
& + \beta_3 Domestic\ News_{city,K,t-1} + \gamma Z_{i,city,K,t-1} + \delta_i + \delta_{city,t} + \delta_{city,K} + \varepsilon_{i,city,K,t},
\end{aligned}
$$

where $y_{i,city,K,t}$ is the outcome of interest, log productivity change in the baseline case, of firm i in a given city, industry, and year t, $FDI\ News_{city,K,t-1}$ is the number of (all or unique) FDI news in a given city, industry, and year, $Actual\ FDI_{city,K,t-1}$ is the number of actual foreign multinational entry, and similarly $Domestic\ News_{city,K,t-1}$ is the number of domestic investment news.[23] In addition, a vector of firm dummies is included to control for all firm specific characteristics and trends, a vector of city-year dummies is included to control for all time-variant local factors and shocks, and a city-industry fixed effect is used to control for all city-industry-specific factors such as natural location advantages.

We report the results in Table 1. We find significant productivity upgrading by domestic firms in response to local threats of foreign multinational competition. If a domestic firm is exposed to one prospective FDI news in year $t-1$, the firm's TFP would grow, on average, by 0.3 percent in year t. As some future FDI events are reported in more than one news, we also examine how the number of unique news, measured by the number of foreign multinationals appearing in the news in a given city, industry and year, affects domestic firm responses. As shown in column (5) of Table 1, each unique FDI news is associated with 0.8 percent increase in domestic firms' TFP.[24] The effect of actual multinational entry, in contrast, is statistically insignificant.[25] This result is independent of whether we control for FDI news, and echoes the overwhelming existing evidence described earlier showing that actual FDI tends to exert an insignificant or a negative productivity effect on domestic firms, consistent with the expectation that the effect of actual multinational entry can be ambiguous due to two opposing forces.[26] On the one hand,

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[23] While the main analysis considers city-level FDI news, we also considered country-level news and found similar results.

[24] We also examined domestic firms' TFP responses to greenfield FDI and M&A news, respectively, and found that greenfield FDI news exerts a significant effect while M&A has little impact. This is consistent with the fact that most M&A news, included in either our data or alternate sources such as Zephyr and SDC Platinum, have a very short time window between the rumor/announcement date and the actual deal date with an average of around 30 days (according to the Zephyr and SDC Platinum databases).

[25] The above results remained robust when we included the news or the actual entry variable alone. To ensure that the result is not driven by the measurement of actual entry relative to the measurement of FDI news, we also measured actual entry based on information from the same news sources. This, by measuring both anticipated FDI and actual FDI from news, also helps us address the concern that the FDI news variable captures only large FDI activities whereas the actual entry variable from Orbis includes FDI activities of all scales. We found that the results remain similar. In Section 6.5, we formally investigate the significance of the potential large FDI news bias and address the issue in detail.

[26] We also examined domestic productivity response using other alternate productivity estimates that have been considered in the literature. We found that anticipated foreign multinational competition always exerts a

foreign multinationals could generate productivity spillover to domestic firms within the same industry via, for example, labor mobility, knowledge transfer, and input sharing and improve domestic firm productivity. On the other hand, increase foreign multinational activities increase competition in final-good as well as factor and input markets, which could exert a negative effect on domestic firm productivity.

[Table 1 inserted here]

Next we introduce firm-specific measures of FDI threats and examine the specification given below:

$$
\begin{aligned}
y_{i,city,K,t} \;=\;& \alpha + \beta_1 FDI\ News_{i,city,K,t-1} + \beta_2 Actual\ FDI_{i,city,K,t-1} \\
& + \beta_3 Domestic\ News_{i,city,K,t-1} + \gamma Z_{i,city,K,t-1} + \delta_i + \varphi_{city,K,t} + \varepsilon_{i,city,K,t},
\end{aligned}
\tag{2}
$$

where $FDI\ News_{i,city,K,t-1}$ is the domestic-firm-specific measure of FDI news, measured by the average number of FDI news across a domestic firm's products, constructed based on each domestic firm's city location and initial product mix, $Actual\ FDI_{i,city,K,t-1}$ is the domestic-firm-specific measure of actual FDI, measured by the average number of actual foreign multinational entry across a domestic firm's products, and similarly $Domestic\ News_{i,city,K,t-1}$ is the domestic-firm-specific measure of domestic investment news.[27] This specification enables us to explore cross-firm variations in exposure to FDI threats and control for all time-varying local factors and shocks with a vector of city-industry-year dummies and all firm-specific factors with a firm fixed effect. A city-industry cluster is also used to avoid serial correlation in the error term across years within a city and industry.[28]

The results are reported in Table 2. Again, we find significant productivity upgrading by domestic firms and the degree of responses increases with the level of exposure. If a domestic firm is exposed to one FDI news in year $t-1$, the firm's TFP would grow, on average, by 0.6 percent in year t. As some future FDI events are reported in more than one news, we also examine how the number of unique news, measured by the number of foreign multinationals reported in the news in a given city, industry and year, affects domestic firm responses. As shown in column (2) of Table 1, each unique FDI news is associated with 4.9 percent increase in domestic firms' TFP. The effect of actual multinational entry, again, is statistically insignificant.

[Table 2 inserted here]

Given that our productivity measure for Chinese firms is estimated using the Chinese NBS data (following the same methodology described in Section 4), we also perform the analysis

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significant and positive effect on domestic firm TFP while actual foreign multinational competition generally has an insignificant impact. In Section 6.5, we report additional robustness analysis.

[27] While the main analysis considers city-level FDI news, we also considered country-level news and found similar results.

[28] There are in total 144,508 city-industry clusters where there are multiple observations.

separately for the Orbis sample (excluding China) and the Chinese NBS sample.[29] The results are qualitatively similar even though the magnitudes are different. As shown in Table 3, the marginal effect of each additional FDI news is greater in the Orbis sample than in the Chinese NBS sample. For example, each unique FDI news is associated with 6.4 percent higher productivity for non-Chinese firms and 5.8 percent higher productivity for Chinese firms, possibly in part due to the considerably larger number of FDI news in China.

[Table 3 inserted here]

Next we account for the size of threats. Most investment news report the expected size of the future investment, including either expected output, expected local labor employment, or investment value. We hence estimate the following equation:

$$
\begin{aligned}
y_{i,city,K,t} &= \alpha + \beta_1 FDI\ News_{i,city,K,t-1} + \beta_1' FDI\ News_{i,city,K,t-1} \times Threat\ size_{i,city,K,t-1} \\
&\quad + \beta_2 Actual\ FDI_{i,city,K,t-1} + \beta_3 Domestic\ News_{i,city,K,t-1} \\
&\quad + \gamma Z_{i,city,K,t-1} + \delta_i + \varphi_{city,K,t} + \varepsilon_{i,city,K,t},
\end{aligned}
\tag{3}
$$

where $Threat\ size_{i,city,K,t-1}$ is the average expected output, employment, or investment value of investments described in the news.

As reported in Table 4, we find the response of domestic firms to increase significantly with the size of threats. Future multinational competition with a greater investment value or a greater expected employment motivates a steeper productivity upgrading by domestic firms. For example, a 100-percent increase in future competitors' anticipated local employment leads to 1.6 percent greater TFP improvement by domestic firms.

[Table 4 inserted here]

We also explore the time path of productivity response in the window after the arrival of the FDI news and before the expected occurrence of FDI. The analysis shows that the TFP response is most pronounced when FDI is soon due to occur (i.e., as the expected investment date approaches). FDI news with a relatively long time window between the arrival of news and the expected arrival of competition tend to have little immediate effect on domestic firms.[30]

5.2 Innovation

Next we explore the underlying mechanisms of productivity upgrading, specifically how domestic firms respond to the threat of foreign competition through innovation and investment decisions.

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[29]The Chinese firm sample is restricted to the period of 2005-2007 because of availability of the material cost data.

[30]This result is not reported and available upon request.

First, we use a cross-country patent application and citation dataset obtained from Orbis which reports information such as patent name, international patent classification (IPC) code, patent application date, citing document, cited document, application outcome, current owner country code, and inventor country code. We compute the number of patent applications filed by each domestic firm in a given year and use it as a proxy for innovation as in many previous studies such as Aghion et al. (2009), Bloom et al. (2013) and Bloom, Draca and Van Reenen (2016). As shown in Table 5, we find that FDI news exert a positive and significant effect on domestic firms' patenting activities. Domestic firms raise patenting by, on average, 1.4 percent in response to firm-specific FDI threats. Actual FDI, in contrast, does not exert a significant effect on patents. The positive innovation response to the threat of FDI is consistent with existing theoretical predictions by, for example, Spence (1981) and Aghion et al. (2009) suggesting that incumbent firms should take preemptive innovation actions before new competition arrives to weaken the competitiveness of new rivals.[31] This incentive is stronger than the incentive to innovate after the actual arrival of competition, confirmed in the results above, because ex-ante actions tend to be more effective and less costly.

[Table 5 inserted here]

Second, we find that domestic firms also tend to increase investments after being exposed to the threat of FDI. Each unique FDI news is associated with 10.5 percent increase in domestic firms' investment. Third, a similar pattern emerges when we examine the average wage paid by domestic firms. Domestic firms are found to raise average wage rates by 1 percent in response to each unique FDI news, implying increased demand for skilled labor in anticipation of foreign threats.

5.3 Product Composition

Now we examine how domestic firms might respond to the threat of foreign competition by adjusting product composition, including adding and dropping products and switching primary goods, using the firm product data from Orbis.[32] As shown in Table 6, we find that domestic firms are, on average, 28 percent more likely to drop products and 9 percent more likely to switch primary products when facing FDI threats on their products. In contrast to its effects on

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[31]Similar to our findings, Bloom, Draca and Van Reenen (2015) document prompt patenting responses to import competition from China. In contrast to Bloom, Draca and Van Reenen (forthcoming) who find a 10-percentage-point increase in Chinese import penetration is associated with a 3.2 percent increase in patenting in the same year, we find that domestic firms raise patenting by, on average, 1.4 percent the next year in response to firm-specific FDI threats. An alternative interpretation of the result is that firms may simply be applying for more patents to protect their existing knowledge in anticipation of greater foreign competition. If that is the case, the average quality of patents is likely to fall. To examine this effect, we followed Bloom, Draca and Van Reenen (forthcoming) by looking at average citations per patent and did not find that is the case.

[32]Here, the analysis constructs the product adjustment variables by comparing each firm's product composition in 2005 and 2007, the two years that offer the best product data coverage, and as a result the firm fixed effect is not included.

innovation, the actual entry of multinational firms is found to exert a similar effect on product composition. Domestic firms are 17 percent more likely to drop products and 13 percent more likely to switch their primary products after the actual arrival of FDI. This result is consistent with theories outlined in Section 2 (e.g., Bernard, Redding and Schott, 2010; Eckel and Neary, 2010; Bloom et al., 2013; Nocke and Yeaple, 2014; Mayer, Melitz and Ottaviano, 2014, 2015), suggesting that both the threat of foreign competition and actual foreign competition can lead domestic firms to change their product mix by dropping and switching products.

[Table 6 inserted here]

The above results remain robust when we explore the information reported by Chinese NBS Survey on R&D decision, average wage rate, and new product introduction. We find in Table 7 that Chinese firms raise R&D expenditure significantly when facing FDI threats. The probability of increased R&D rises by, on average, 2 percent when domestic firms are threatened by future FDI competition across their products. Chinese firms are also more likely to report introduction of new products after exposure to FDI news.

[Table 7 inserted here]

5.4 Heterogeneous Firm Response

Next we examine potential heterogeneity in domestic firms' responses and how they might vary (i) within each industry, (ii) across industries, and (iii) across countries.

Cross-Firm Heterogeneity We first explore how domestic firm responses to the threats of multinational competition might vary within each industry—depending on their productivity level—by interacting the news variables with domestic firms' lagged TFP as well as its square term.

The estimates reported in Table 8 suggest a non-monotonic, U-shape pattern: domestic firms at the right and left tails of the TFP distribution tend to upgrade TFP in response to the news while domestic firms with intermediate TFP levels show little reactions. Specifically, we show in Figure 8 that when divided into 5 bins, domestic firms in the top bin and the bottom bin of each industry in each country both upgrade TFP in response to FDI news. Specifically, the top-bin domestic firms upgrade TFP by, on average, 5 percent and the bottom-bin domestic firms by 12 percent, in response to FDI threats. In contrast, domestic firms in the middle three bins of each country and industry do not change their TFP significantly.

[Figure 8 inserted here]

A natural question now is: do the most productive and the least productive firms upgrade TFP in the same way? We find that the mechanisms underlying the TFP response are sharply

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different depending on the levels of TFP. Our analysis in Table 8 and Figure 8 shows that only the most productive domestic firms—firms closest to the frontier—respond to FDI news with more patenting. The top two bins of domestic firms increase patenting by about 3 and 2 percent, respectively, when exposed to FDI threats while the other, less productive firms exhibit insignificant responses. This result is similarly seen for Chinese firms where we find that more productive Chinese firms are more likely to increase R&D in response to FDI news. In sharp contrast, the result is opposite for product adjustment. Table 8 and Figure 7 show that while all bins of domestic firms tend to drop products in response to FDI threats, the response is significantly stronger for the less productive bins. The bottom two bins of domestic firms are 41 and 39 percent, respectively, more likely to drop products when facing FDI threats while the other bins are around 30 percent more likely to drop products after FDI news. Unlike the TFP results, we do not have a significant U-shape relationship for innovation and product composition decisions. These findings suggest that while both the most and the least productive domestic firms upgrade productivity when threatened by FDI news, they do so through distinctively different mechanisms.

[Tables 8-9 inserted here]

Incorporating a unique dataset from Orbis that reports top direct competitors of MNCs, we also investigate how news of an MNC's new FDI activity (e.g., Toyota's new investment in China) might affect the behavior of the MNCs' top competitors, most of which are MNCs themselves (e.g., GM's existing subsidiary in China), and how the responses of these global players might differ from those of average domestic firms. Given that top competitors are firm-specific, this also offers us an additional dimension of firm variation to identify the effect of FDI news. Our analysis in Table 10 shows that top competitors respond to the news by increasing local advertising expenses rather than innovation, suggesting increased marketing efforts to expand the local customer base.[33] This is not surprising since these firms are most likely already competing with one another in other locations; a new Toyota subsidiary in China is hence more likely to influence GM's marketing—than TFP and innovation decisions—in China.[34]

[Tables 10-11 inserted here]

Next, we examine how firm responses to FDI threats could vary across different types of firms depending on the firm's operation structure. For example, single-plant firms are likely to be more affected by the threat of foreign multinational competition due to their location concentration; similarly, firms that sell only domestically could respond more strongly to future competition in product markets. These hypotheses are confirmed in Table 11 in which we find

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[33]The results are suppressed here but available upon request.

[34]As a separate exercise, we also examined host-country stock market responses to publicly listed domestic firms that are exposed to FDI news and found that even with the control of firm and daily fixed effects, the stock prices of the publicly listed domestic companies fall significantly the day after an FDI news is announced.

that, compared to the baseline result reported in Table 2, the estimated effect of FDI news is significantly stronger for single-plant firms as well as non-exporting and non-multinational firms in the host country (albeit to a lesser degree). Since our firm-specific measures rely on firm variations in product composition, we also separately consider multi-product firms and find similar results.

Cross-industry Heterogeneity Responses to the threat of foreign competition could also vary across industries. Aghion et al. (2005), for example, show that more competition may foster innovation for firms operating at similar technological levels, i.e., in the so-called "neck-to-neck" industries. In contrast, for technologically-laggard firms, the Schumpeterian effect of competition—where product market competition lowers post-innovation profit margins—could dominate and competition may dampen the innovation incentives. We explore this prediction by constructing two measures of "neck-to-neckness" for each country-industry pair: (i) the average productivity distance of domestic firms to the industry's top productivity level, i.e., $mean[(TFP_i - \max TFP)/\max TFP]$ (following the methodology of Aghion et al., 2005); and (ii) the skewness of domestic firm productivity.[35]

As shown in Table 12, we find that firm TFP responses increase significantly with the extent to which an industry's competition is "neck-to-neck" as predicted by Aghion et al. (2005). Industries with more "neck-to-neckness", reflected by either a lower average distance to the productivity frontier or a more-left-skewed productivity distribution, show more productivity upgrading in response to foreign multinational threats. This result suggests that when domestic firms within a country and an industry are mostly concentrated toward the productivity frontier, the threat of foreign multinational competition leads to strong incentive to innovate and upgrade productivity, which subsequently helps domestic firms better compete with foreign rivals after the rivals actually enter. In contrast, technologically-laggard industries, featuring a greater concentration of unproductive domestic firms and a more right-skewed productivity distribution, have reduced incentives to innovate and upgrade productivity.[36]

[Table 12 inserted here]

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[35]We also considered alternate definitions of productivity frontier including, for example, the mean of the top 95 percentile and excluding outliers and did not find the results to be sensitive.

[36]We also exploited how the impact of FDI threats could vary depending on the potential degrees of localized product and factor markets. For example, industries whose domestic product markets are relatively shielded from foreign competition by high transportation cost could have incentives to react more strongly to the threat of foreign multinational firms coming to town. Industries with a greater dependence on local labor markets could also feel more threatened by increasing competition in labor markets by foreign multinational firms. We hence separately considered industries with higher-than-median levels of freight cost intensity and industries with higher-than-median levels of labor intensity and found that these industries indeed exhibit stronger TFP responses to FDI news. Each FDI news led to 10.3 and 8.4 percent productivity growth in high freight-cost and high labor-intensity industries, respectively.

Cross-country Heterogeneity Next we examine how domestic firms' responses to FDI news might vary across FDI source and destination countries, specifically, between developed and developing host countries and between developed and developing source countries. We find in Table 13 that domestic firms in developing countries respond significantly to FDI news with, on average, a 4.3-percent increase in productivity. The productivity response in developed host countries, by comparison, is greater in magnitude, around 7.7 percent. Across FDI source countries, we find that domestic firms respond primarily to news of FDI by multinationals from developed countries; news of FDI originating from developing countries does not exert a significant effect.

[Table 13 inserted here]

6 Establishing the Effect of Information

6.1 Exploring the Substance of News

Given that the goal of this paper is to investigate the role of information in firm behavior, we next explore the content of each news to extract useful information contained in the news and examine how domestic firms' reactions might vary with the specific information provided. Exploiting the effect of news content helps to better establish the role of news/information as the specific substance reported—such as whether the news mentions investment motive or target market—and the tone of language used in each news tend to be driven by the information available to the news reporters and less likely—compared to the incidence of news reporting—to be driven by unobserved local productivity shocks.

We find that the substance of news significantly affects domestic firms' behavior. First, we identify whether the news reveal any uncertainty or ambiguity (such as contingencies on government approval) about the foreign investments by either explicitly mentioning the uncertainty and contingency or using ambiguous language such as "intend to", "consider", "may invest", "want to invest", "could invest", and etc. in describing a future FDI event.

For example, the following news, "ExxonMobil is also considering joining Sinopec in other petrochemical projects and is waiting for government approval for a petrochemicals complex to be built in Fujian province in partnership with Fujian Petrochemical and Saudi Aramco" and "Chinese telecommunications products maker Huawei Technologies intends to invest in the building of a research and development (R&D) centre in Romania," have either mentioned contingency of the investment (on government approval) or used uncertain words such as "intend to" and are thus considered as news with uncertainty. In contrast, investments in news like "Ciba Specialty Chemicals Holdings Inc. (CSB) said Monday it has signed an agreement with local authorities in Qingdao, China, to invest in a new pigment plant that will significantly expand its production network in Asia" are, in our definition, described with certainty. Threats

reported with uncertainty are considered less credible than threats reported unambiguously.[37] Domestic firms were found to respond more strongly, in terms of both productivity and innovation decisions, to more credible FDI threats—that is, FDI news where the investments are described less ambiguously.[38]

Next, given that the investment reported in the news could appear in various parts of the article (front, middle or last paragraphs), the position in which the investment information is first provided could offer another useful way for examining the importance of information. For each news article, we thus record the position of the paragraph in which the investment was first described. Interacting that measure with the FDI news variable, we find that news in which information of the investment is provided in earlier paragraphs have a stronger effect on domestic firm responses.[39]

Many FDI news also report the target markets of prospective foreign multinational firms. It is plausible to anticipate FDI threats targeted to host-country markets to exert a greater impact on the product market competition faced by domestic firms than FDI threats targeted to export markets. We hence sought to identify the motives and target markets of each prospective foreign multinational investment whenever the information is available and examined how domestic firm responses could vary systematically. As shown in Table 14, we find only news of foreign investments targeted to domestic markets affect domestic firms' TFP, R&D and investment decisions. News of export-platform investments, in contrast, have no significant influence.

[Table 14 inserted here]

6.2 Falsification Tests

In the analysis so far, we accounted for all time-variant city-industry specific factors using a city-industry-year fixed effect and all firm-specific factors using a firm fixed effect, addressing the possibility that FDI news might be driven by local industry-specific shocks and trends or firm-specific factors and trends. While it is unlikely that the incidence as well as the substance of FDI news is systematically driven by each individual domestic firm's future productivity shocks, we also included firm-specific domestic investment news as an additional control to control for

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[37] See the Data Appendix for a more detailed discussion of alternative (conservative v.s. liberal) definitions used.

[38] The results were not reported in a table, but available upon request. In addition to the substance of news, we also investigated how domestic firms' responses might vary with the influence of the news. In the news dataset, we collected the word count, the publication title, and the news agency of each news. To differentiate the influence of each publication, we obtained additional information about each news source, including the circulation volume of the publication title and the national reputation of the news agency, from data sources such as Ulrich, News Bank's Access World News, and Audit Bureau of Circulation. We then computed, for each city, industry, and year, the average word count of news and the average circulation volume of publication titles reporting multinational entry news. We found that domestic firms exhibit stronger TFP response to more influential news, specifically news from publications with a larger circulation volume.

[39] An alternative explanation for the result that incumbents are responding more strongly to information described in the headline or an early paragraph is that those information is more important and valuable to the incumbents and hence exerts a greater effect.

firm-specific potential demand and productivity shocks that might be correlated with news. In this sub-section, we take several extra steps by performing a set of falsification tests to further examine the robustness of our results.

First, we consider a placebo test by exploiting the specific timing of FDI news and assuming that each FDI news had been published six months or a year earlier or later. If FDI news indeed capture local or domestic firms' productivity and economic trends or simply reflect actual FDI trends, the slight backward or forward adjustment in the timing of news should lead to relatively small changes in the estimated effect of FDI news. If, instead, the empirical concern does not apply, FDI news, when assumed to have been published before the actual publication date, should not lead to any response by domestic firms; similarly, when assumed published after the actual publication date, the in-effect aged FDI news should result in little or much more moderate domestic firm responses. As shown in Table 15, we find no significant TFP responses in the falsification setting.

[Table 15 inserted here]

Second, we perform a falsification test by investigating the effect of FDI news on other performance outcomes such as revenue and profit growth. If indeed FDI news reflect domestic-firm or city-industry specific trends (for instance, FDI news are reported because of the expected demand boom or actual FDI trends), we should expect as well a significant correlation between FDI news and other firm-level growth variables such as profit growth. This hypothesis is not supported in the data. We do not observe any significant relationship between anticipated competition and domestic firms' profit growth. The effect of FDI news is pronounced only in productivity, innovation, and the other strategic responses examined earlier. These results offer us further reassurance that the estimated effect of FDI news is unlikely to have captured economics trends and shocks that are not already controlled for or the effect of actual FDI.

6.3   IV Analysis

Next we further strengthen our identification strategy, in addition to the steps that have already been taken, and offer additional sensitivity analysis using an IV approach. Given our sets of controls for all time-varying local shocks and time-invariant firm factors, the primary remaining concern could be the possibility that FDI news are systematically driven by unobserved individual domestic firm shocks (given that city-industry-level shocks have already been accounted for). To mitigate this concern, we adopt two alternative strategies.

First, we isolate a subset of news articles that briefly touch upon, but do not center on, foreign investment issues. Specifically, we consider weekend narrative news on broad topics which meet the following criteria: (i) the title of the news is not FDI related (e.g., does not contain any words related to investment); (ii) the articles were narrative and published over weekends. Examples of such news include news with headlines such as "Chinese Economic News

in Brief," "Technology Brief," and "Voice of the Mirror - Euro is the only route for Britain." Compared to weekday FDI news which tend to devote its entire content to describing specific FDI events and usually cater to targeted readers with strong business interests and orientations, narrative weekend news tend to cater to broader, general-interest audiences with preferences for lighter business content. FDI news in this category are often a relatively minor and subtle part of a long narrative article focusing on non-FDI-specific topics and does not offer detailed information content on specific investments. Thus, the probability for FDI news embedded in weekend narrative articles to be driven by an individual domestic firm's shocks and trends or to directly influence domestic firms' behavior is very low, making the former a plausible instrument for weekday FDI-focused news. We find in Table 16 that indeed weekend narrative FDI news is a good predictor of FDI-oriented weekday news; further, not surprisingly, there is a positive correlation between weekday FDI news and actual FDI as well as between weekday FDI news and domestic investment news. In the second stage, we find that the estimated effect of the instrumented weekday FDI news, measured at the domestic-firm level (by linking predicted FDI news to each firm's city and product mix), is positive and significant.

[Tables 16-17 inserted here]

Table 16 also shows that the IV estimates tend to have a bigger magnitude than the OLS estimates. This is not uncommon and has been similarly seen in Keller and Yeaple (2009) and Bloom, Draca and Van Reenen (2016). A possible explanation, as noted by Keller and Yeaple (2009) is that when there is heterogeneity in the effects of FDI news as we reported in Section 5.3, the point estimate in the IV estimation reflects the impact of FDI news induced by the specific instrumenting variable and will depend on the observations that drive identification.

In the second strategy, we exploit the interdependence between FDI news and other news categories in the supply decisions of news media while the other news categories are unlikely to be correlated with individual firms' productivity shocks (in a way that goes beyond the city-industry wide effect). For example, the volume of FDI news could be influenced by domestic political news. Readers' interests in FDI issues could increase with political developments, motivating media to pay more attention to FDI activities, especially FDI activities in the city's main industries. This could lead to a positive relationship between the two types of news. On the contrary, FDI and economic news in general could be crowded out by sports news, as readers' interests in those issues likely subside during sports events. These interactions provide us relatively exogenous sources of variation in FDI news. We hence collect time-varying city-specific political and sports news and use these two types of news as instruments for FDI news. We find in Table 17, as anticipated, a positive interdependence between media attention to FDI and domestic politics and a negative correlation in media coverage on FDI and sports. FDI news tend to rise during times of increasing political events and fall during rising sports news. The instrumented FDI news, on the other hand, remain to exert similar effects on domestic firms.

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6.4 Economic Magnitude

We now discuss the magnitude of the economic impact of FDI news on productivity growth that is suggested by our estimates. As Bloom, Draca and Van Reenen (2016) noted, it is difficult to examine general equilibrium results which require taking into account a range of broader impacts. Nevertheless, we can, as in Bloom, Draca and Van Reenen (2016), use the regression coefficients to perform partial equilibrium calculations to get rough magnitudes for the potential importance of FDI threats in shaping individual firms' productivity growth.

In 2001-2007, we estimate an average 8-percentage-point productivity growth for domestic firms in our sample. These firms are threatened, on average, 0.08 times during this period. Given the baseline estimate in Table 1 (4.9 percent), this means that firm responses to FDI threats account for 5 percent of firm productivity growth.[40] Actual FDI, in contrast, is not found to contribute net firm productivity gains, as shown in most existing studies. As expected, the economic impact of FDI threats can vary significantly in magnitude across regions and countries. For example, domestic firms in developing countries experienced, on average, a 5-percent productivity growth in 2001-2007. Given that they are threatened, on average, 0.11 times across products and the estimated parameter of FDI news is 0.043, productivity self-upgrading in response to FDI threats account for about 10 percent of firm productivity growth in developing countries.

Our estimated firm productivity gains from responding to FDI threats are comparable to the firm productivity gains from (actual) foreign competition documented in the literature. Focusing on productivity gains from trade liberalization in Chile, Pavcnik (2002) show that 3 to 10 percent of Chilean plants' productivity gains in the import-competing sector is attributable to trade liberalization. Bloom, Draca and Van Reenen (2016), examining the impact of Chinese import competition on European firms, find that over the 2000-2007 period Chinese imports accounted for 9 percent of within-firm TFP growth. Keller and Yeaple (2009), one of the few studies that show actual FDI to increase domestic firm productivity using U.S. manufacturing firm data in 1987-1996, estimate that increases in foreign MNC activities account for 8 percent

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[40]The anticipation of foreign competition could also affect aggregate productivity gains by influencing the innovation and productivity of vertically linked industries. As shown in Goldberg et al. (2010a, b) and Topalova and Khandelwal (2011), increased imports of intermediate inputs could enhance innovation and firm productivity by enabling domestic firms to access better foreign technologies and higher-quality foreign intermediate inputs. Similarly, increased competition in final-good markets could raise the payoff from innovation for intermediate-input producers and motivate them to increase innovation and productivity. This mechanism can become active before actual competition occurs. In anticipation of increased future competition in upstream and downstream industries, domestic firms may increase innovation in advance to better utilize foreign intermediate inputs and access final-good producers when actual entry occurs. While the focus of this paper is to examine the role of foreign competition threats on domestic firm responses in the same industry, we also explored potential responses by domestic input suppliers and downstream customers by constructing the weighted sum of FDI news in upstream and downstream industries using the 2002 Benchmark Input-Output Accounts published by the U.S. Bureau of Economic Analysis. We found that while domestic firms' TFP is not significantly affected by upstream or downstream FDI news, domestic firms' innovation increases when there is FDI news in downstream industries. In addition, actual FDI activities in downstream industries are found to be associated with higher TFP in upstream industries.

of U.S. firm productivity growth.[41]

The above comparison suggests that responses to the threat of foreign multinational competition constitute an economically important mechanism through which foreign competition could affect domestic firms and represent a source of productivity gains that could be equally important as the effects of actual foreign competition due to either FDI or trade liberalization.[42]

6.5 Additional Robustness Analysis

Measure of Productivity and FDI News   In our main analysis, we estimate firm productivity using a recent methodology developed by Ghandi et al. (2012). We have also compared our results using other productivity estimates including simple labor productivity, solow productivity, and Olley and Pakes (1996). As shown in Table 18, the results are qualitatively similar across the different productivity estimates.

As in most empirical work that exploits productivity estimates, we do not observe firm-level physical output quantities and prices. This information is especially difficult to obtain for the large cross-section of countries considered in this paper. We therefore estimate firm productivity based on the output value (instead of physical output) produced by each firm, given its inputs.[43] If foreign multinational competition reduces domestic firm markups or raises input costs, the estimated effects on revenue-based TFP could be biased downward. This could potentially explain the limited evidence on productivity spillover from foreign multinational firms in both this and previous studies, as most empirical work relies on revenue-based productivity measures. It is worth noting that the central findings of the paper—that domestic firms engage in TFP upgrading, innovation, as well as product churning in response to the threat of foreign multinational competition—do not depend on the measures of productivity. Unlike actual foreign multinational competition, competition threats should not cause immediate changes in firm markups or input costs. Furthermore, the limited responses to actual foreign multinational competition are also documented in patenting and R&D decisions, in alignment with the productivity effect.[44]

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[41] We also considered Olley and Pakes (1996) TFP estimates in order to directly compare the results with Keller and Yeaple (2009) and found the estimated economic impacts to be similar.

[42] We also explored how anticipation of future foreign competition and responding to the threat might shape the ex-post effects of actual foreign competition. We differentiated between anticipated and unanticipated foreign multinational entry and found that when enry is anticipated, domestic firms tend to fare significantly better in terms of profit growth and are less likely to exit after the actual arrival of foreign multinational firms. These results suggest that the opportunity of responding to the threat of foreign competition could help mitigate the market reallocation effects of actual foreign competition.

[43] Note that even if price or physical output information were observed, the relationship between prices and markups would still be unclear. Higher prices can reflect higher quality, instead of higher markups. De Loecker (2011) introduces a methodology that uses detailed product-level information to recover the markups and the output-based productivity of firms. However, this approach requires specific assumptions regarding the mechanisms through which demand shocks affect prices and productivity.

[44] Another related point is that as in most firm-level datasets, our data do not report firm revenue and cost information by product for multi-product firms and hence do not allow us to estimate product-specific firm productivity. We hence evaluate how a firm's average exposure to FDI threats across its product mix might influence the firm's total productivity. See De Loecker, Goldberg, Khandelwal, and Pavcnik (2016) for methodologies to

Next, we also consider an alternative measure of FDI news by normalizing the count of FDI news and scaling it by host country population. We find in Table 19 that the results are qualitatively similar. A 1-percentage-point increase in the normalized ratio of FDI news is associated with 0.96 percent increase in TFP.

[Tables 18-19 inserted here]

Large FDI News Bias A plausible concern that could arise in our analysis is that news might have the tendency to report large investments or investments undertaken by large companies, which could then introduce an upward bias in our estimated effects of FDI news. We address the issue and its potential implications in several ways. First, we examine the correlations between the expected size of FDI (measured by investment value, output, or employment) and the frequency of being reported and find them to be generally lower than 0.2. The correlations of the expected size of FDI with the influence of the news publications (measured by circulation volume) are about 0.1, while the correlations with the content length of the news (measured by the word count) is about 0.05. These observations suggest that—among FDI events reported in the news—large FDI events do not systematically receive large media attention.

Second, we measured actual FDI entry also based on the information from news sources. By measuring both anticipated and actual FDI from news, we address the concern that the FDI news variable might capture only large FDI activities whereas the actual entry variable from Orbis includes FDI activities of all scales. We found that the findings remain similar.

Third, we re-performed our main analysis (such as Table 1) by separately focusing on FDI news with less-than-median expected investment value, output, or employment. We find that, on average, these relatively small-scale FDI news exert a quantitatively similar impact on domestic firm responses.

Data Coverage Our analysis spans across a wide sample of countries; however, the degree of coverage, in terms of news publications and domestic firms, can vary significantly across countries. In this sub-section, we examine the robustness of the results by restricting the analysis to countries with the best data coverage.

First, we acknowledge that Factiva, albeit being the most comprehensive news archive in the world, varies in its news coverage across countries. In many developed countries, Factiva covers both national and subnational local news publications (for example, our final sample of FDI news covers 181 publications in the U.S., 131 in the U.K., and 82 in Russia, while the complete coverage of Factiva—with or without FDI news—is much broader in all countries). However, in other—often less developed—countries, Factiva covers primarily national and major local news publications. To address this issue, we perform our main analysis for the top 10 countries with the largest number of news publications in Factiva and find that our main findings remain largely

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estimate markups from production data with multi-product firms.

similar (column (2) of Table 19). Second, we also address the varying coverage of Orbis across countries. As noted before, while the coverage of Orbis is fairly comprehensive in countries such as France, Spain, Italy, Romania, Ukraine, and South Korea, it can be unsatisfactory in others. We examine the sensitivity of the results by focusing on 15 countries with the largest firm coverage. As shown in column (3) of Table 19, we find that the main result does not change qualitatively.

7 Conclusion

In this paper, we investigate domestic firm responses to foreign competition threats using a unique constructed dataset of foreign investment news and exploring time lags between the arrival of foreign investment news and the expected arrival of actual investments. We investigate firm responses in both productivity and underlying mechanisms including innovation, investment and product composition. Our results indicate that domestic firms respond significantly to the threat of foreign multinational competition by increasing productivity, innovation, and investment and adjusting product composition. The actual arrival of foreign investment, in contrast, leads to product dropping and switching only, without a significant firm productivity effect. The degree of responses to FDI threat also increases with the amount of information regarding the certainty level of future investments and how soon the investment information is provided in a news.

Our analysis also shows that responses to FDI news exhibit substantial heterogeneity across firms, industries as well as countries. Within each industry, domestic firms at the right and left tails of the TFP distribution respond significantly to the news by upgrading TFP while domestic firms with intermediate TFP levels show little reactions. Further, the mechanisms of TFP upgrading differ sharply across firms. Domestic firms closest to the productivity frontier improve TFP by increasing innovation while domestic firms furthest behind enhance their TFP by dropping products. Across industries, domestic firms in industries with more fierce competition—the so-called "neck-to-neck" industries featuring a less-dispersed and more-left-skewed productivity distribution—respond more strongly to foreign multinational threats. Further, domestic firms in developed countries are found more responsive to FDI news and FDI news from developed nations are found more influential.

We undertake two approaches to address potential correlations between FDI news and unobserved domestic firm shocks that remain after the use of city-industry-year and firm fixed effects. First, we use various placebo tests by exploiting the exact timing of FDI news. For example, we assume that each FDI news had been published slightly earlier or later and find no domestic firm response to the placebo news. Second, we adopt alternative IV approaches by exploiting the differences between weekday and weekend news and the interdependence between FDI news and other types of news including political and sports news. Our analysis shows that the estimated

effect of FDI news remains robust. In establishing the magnitude of the economic impact of FDI news, we show that in 2001-2007 responses to FDI threats account for 5 percent of firm productivity growth across all sample countries and 10 percent of firm productivity growth in developing nations

Our analysis contributes to the literature by offering new evidence on the effect of foreign competition threats and distinguishing between preemptive, strategic actions and the spillover and market reallocation effects of actual foreign competition. Our findings show that the latter are not the only links that connect foreign competition with domestic firm performance: domestic responses could be initiated before the actual arrival of competition. The response to competition threats represents an economically important and different mechanism through which globalization affects domestic economies, constituting in the context of this paper the central source of firm productivity gains from multinational competition. Evaluating the gains from foreign competition based exclusively on the ex-post effects could thus lead to an underestimation of the aggregate gains. Economic policies aiming to foster the innovation and productivity growth of domestic firms also should not be delayed until the actual arrival of foreign competition and should evolve over time with the development of foreign competition.

References

[1] Ackerberg, Daniel, Kevin Caves, and Garth Frazer. 2006. "Structural Identification of Production Functions." mimeo.

[2] Aghion, Philippe, Nicholas Bloom, Richard Blundell, Rachel Griffith and Peter Howitt. 2005. "Competition and Innovation: An Inverted U Relationship." *Quarterly Journal of Economics* 120(2): 701-728.

[3] Aghion, Philippe, Richard Blundell, Rachel Griffith, Peter Howitt, and Susanne Prantl. 2009. "The Effects of Entry on Incumbent Innovation and Productivity." *Review of Economics and Statistics* 91(1): 20-32.

[4] Aitken, Brian, and Ann Harrison. 1999. "Do Domestic Firms Benefit from Foreign Direct Investment? Evidence from Venezuela." *American Economic Review* 89(3), 605-618.

[5] Aitken, Brian, Ann Harrison, and Richard E. Lipsey. 1996. "Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela and the Unites States." *Journal of International Economics* 40(3-4), 345-371.

[6] Alfaro, Laura and Maggie Chen. 2015. "Selection and Market Reallocation: Productivity Gains from Multinational Production." NBER working paper #18207.

[7] Amiti, Mary and Amit Khandelwal. 2013. "Import Competition and Quality Upgrading." *Review of Economics and Statistics* 92(2), 476-490.

[8] Bernard, Andrew, Stephen Redding, and Peter Schott. 2010. "Multi-product Firms and Product Switching." *American Economic Review* 100(1): 70-97.

[9] Bloom, Nick, Mirko Draca, and John Van Reenen. 2016. "Trade Induced Technical Change: The Impact of Chinese Imports on Innovation, Diffusion and Productivity." *Review of Economics and Studies* 83(1): 87-117.

[10] Bloom, Nick, Paul Romer, Stephen Terry and John Van Reenen. 2013. "A Trapped Factors Model of Innovation." *American Economic Review Papers and Proceedings* 103(3): 208-13

[11] Bustos, Paula. 2011. "Trade Liberalization, Exports, and Technology Upgrading: Evidence on the Impact of MERCOSUR on Argentinian Firms." *American Economic Review* 101: 304–340.

[12] De Loecker, Jan. 2013. "Detecting Learning by Exporting." *American Economic Journal: Microeconomics* 5(3): 1-21.

[13] Eckel, Carsten and Peter Neary. 2010. "Multi-product Firms and Flexible Manufacturing in the Global Economy." *Review of Economic Studies* 77:1: 188-217.

[14] Fernandes, Ana, and Caroline Paunov. 2012. "Foreign Direct Investment in Services and Manufacturing Productivity: Evidence for Chile. " *Journal of Development Economics* 97: 305-321.

[15] Fons-Rosen, Christian, Sebnem Kalemli-Ozcan, Bent Sorensen, Carolina Villegas-Sanchez, and Vadym Volosovych. 2013. "Quantifying Productivity Gains from Foreign Investment." NBER Working Paper No. 18920.

[16] Gandhi, Amit, Salvador Navarro, and David Rivers. 2012. "On the Identification of Production Functions: How Heterogeneous is Productivity." mimeo.

[17] Goldberg, Pinelopi, Amit Khandewal, Nina Pavcnik, and Petia Topalova. 2010a. "Multi-product Firms and Product Turnover in the Developing World: Evidence from India." *Review of Economics and Statistics* 92(4), 1042-1049.

[18] Goldberg, Pinelopi, Amit Khandewal, Nina Pavcnik, and Petia Topalova. 2010b. "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India." *Quarterly Journal of Economics* 125(4), 1727-1767.

[19] Guadalupe, María, Olga Kuzmina, and Catherine Thomas. 2012. "Innovation and Foreign Ownership." *American Economic Review* 102(7): 3594-3627.

[20] Helpman, Elhanan, Marc Melitz, and Stephen Yeaple. 2004. "Export versus FDI with Heterogeneous Firms." *American Economic Review* 94(1): 300-316.

[21] Javorcik, Beata. 2004. "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages." *American Economic Review* 94(3), 605-627.

[22] Kalemli-Ozcan, Sebnem, Bent Sorensen, Carolina Villegas-Sanchez, Vadym Volosovych, and Sevcan Yesiltas. 2015. "How to Construct Nationally Representative Firm Level Data from the ORBIS Global Database." mimeo.

[23] Keller, Wolfgang, and Stephen Yeaple. 2009. "Multinational Enterprises, International Trade, and Productivity Growth: Firm-Level Evidence from the United States." *Review of Economics and Statistics* 91(4), 821-831.

[24] Levinsohn, James, and Amil Petrin. 2003. "Estimating Production Functions Using Inputs to Control for Unobservables." *Review of Economic Studies* 70(2), No. 243: 317-342.

[25] Lileeva, Alla and Daniel Trefler. 2010. "Improved Access to Foreign Markets Raises Plant-level Productivity. . . For Some Plants." *Quarterly Journal of Economics* 125(3), 1051-1099.

[26] Mayer, Thierry, Melitz, Marc, and Gianmarco Ottaviano. 2014. "Market Size, Competition, and the Product Mix of Exporters." *American Economic Review* 104(2): 495-536.

[27] Mayer, Thierry, Melitz, Marc, and Gianmarco Ottaviano. 2015. "Product Mix and Firm Productivity Responses to Trade Competition." mimeo.

[28] Melitz, Marc. 2003. "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity." *Econometrica* 71(6): 1695-1725

[29] Nocke, Volker and Stephen Yeaple. 2014. "Globalization and Multiproduct Firms." *International Economic Review* 55(4): 993-1018.

[30] Olley, G. Steven and Ariel Pakes. 1996. "The Dynamics of Productivity in the Telecommunications Equipment Industry." *Econometrica* 64(6), 1263–1297.

[31] Pavcnik, Nina. 2002. "Trade Liberalization, Exit, and Productivity Improvement: Evidence from Chilean Plants." *Review of Economic Studies* 69(1), 245-76.

[32] Spence, Michael. 1981. "The Learning Curve and Competition." Bell Journal of Economics 12, 49–70.

[33] Topalova, Petia and Amit Khandelwal. 2011. "Trade Liberalization and Firm Productivity: The Case of India." *Review of Economics and Statistics* 93(3), 995-1009.

[34] Van Biesebroeck, Johannes 2008. "The Sensitivity of Productivity Estimates: Revisiting Three Important Debates." *Journal of Business and Economic Statistics* 26(3), 321-338.
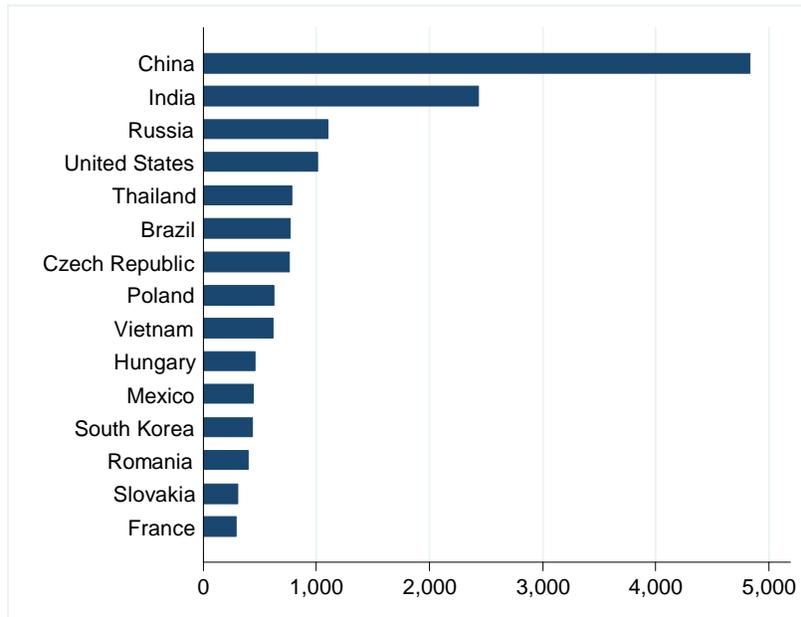
Figure 1: Top host countries by investment news count
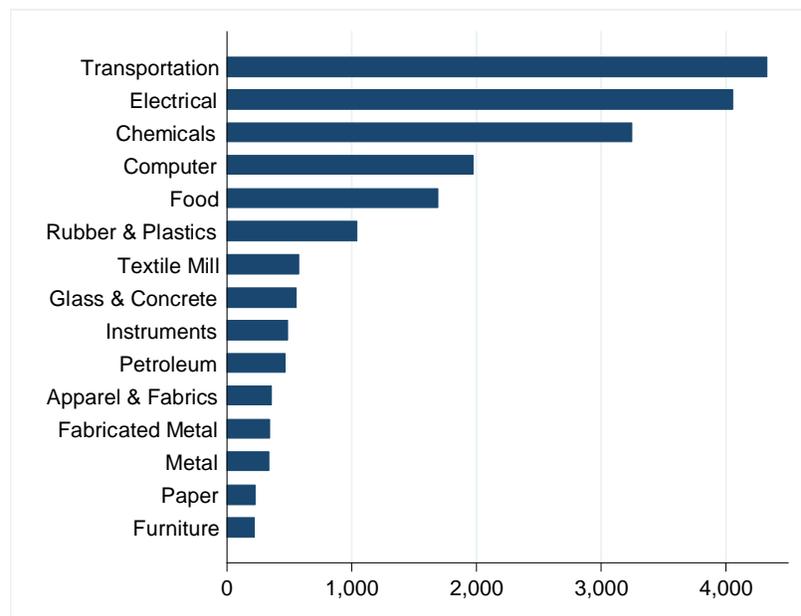
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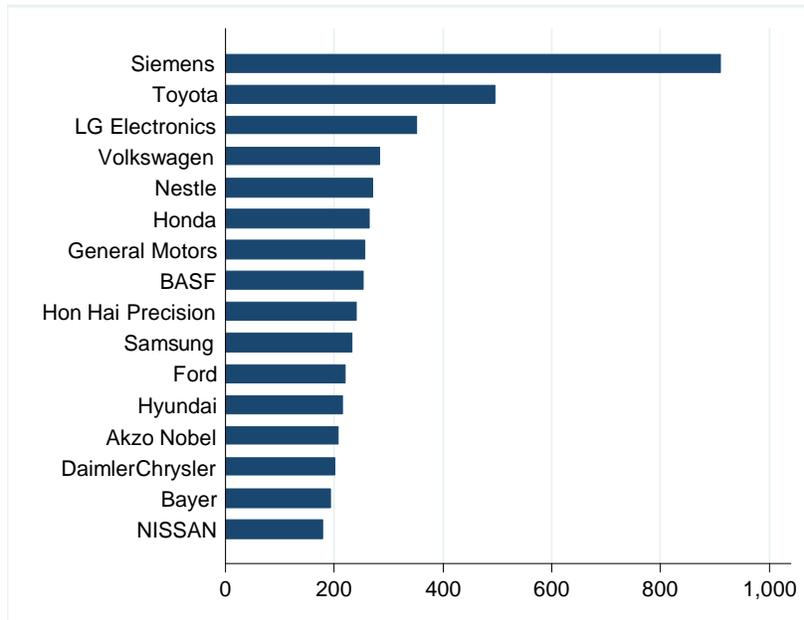
Figure 3: Top multinational firms by investment news count
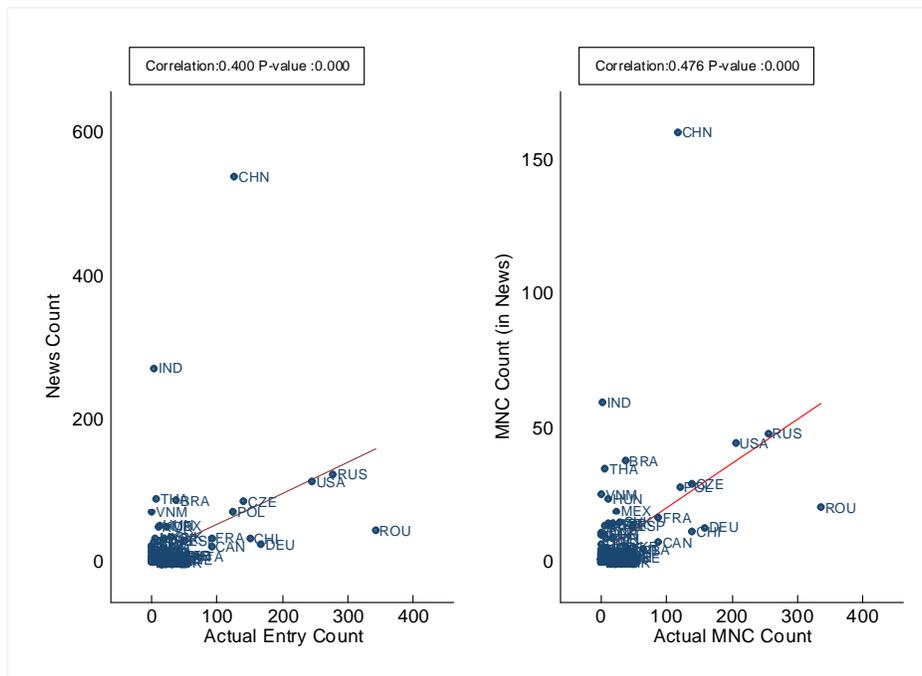
Figure 4: Correlations between FDI news and actual FDI across host countries
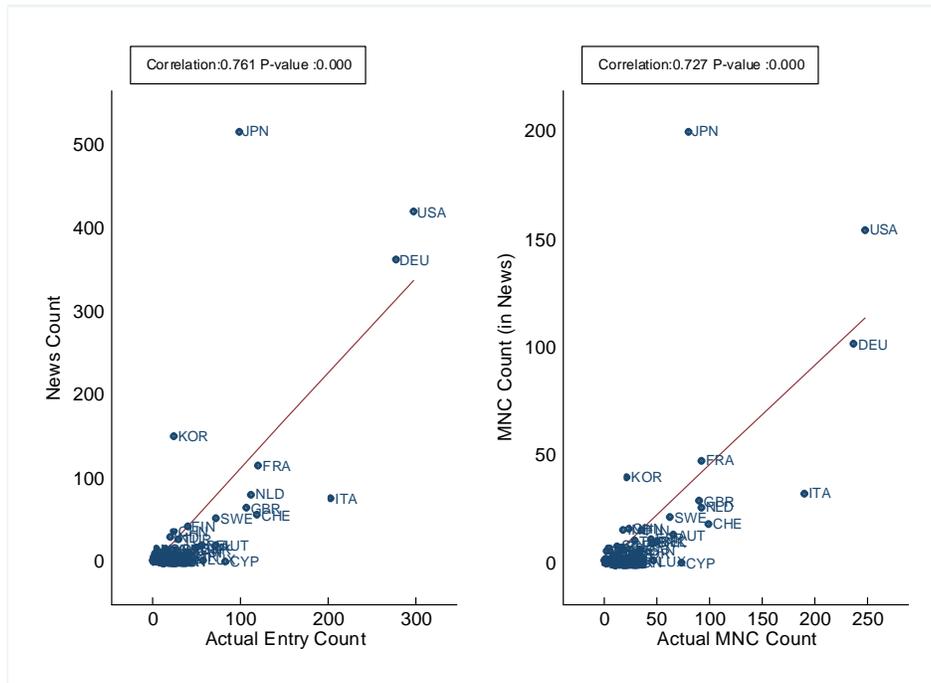
Figure 5: Correlations between FDI news and actual FDI across headquarter countries
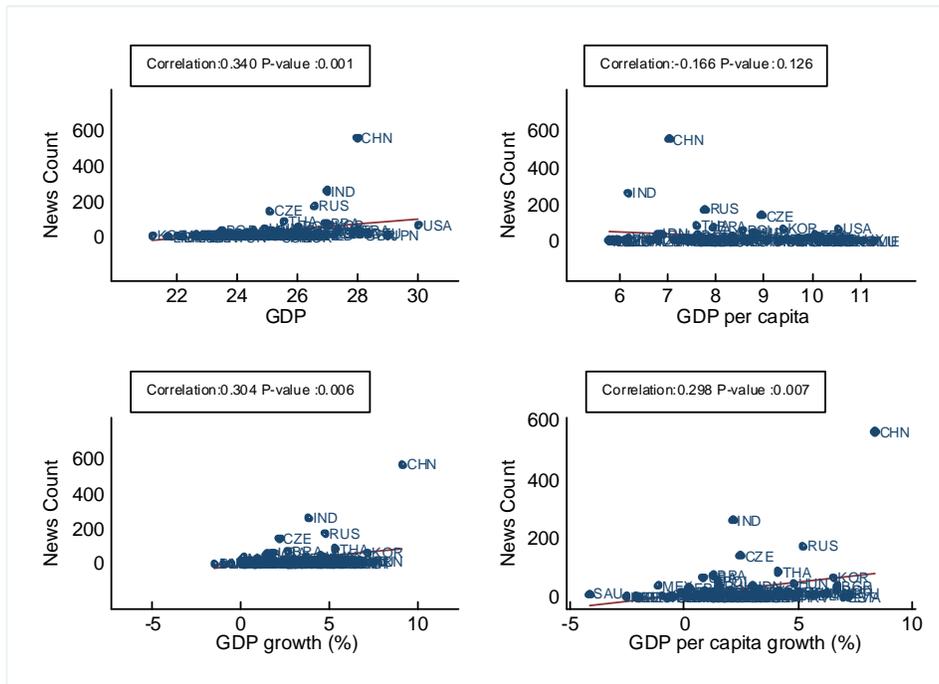
Figure 6: Correlations between FDI news and host country characteristics
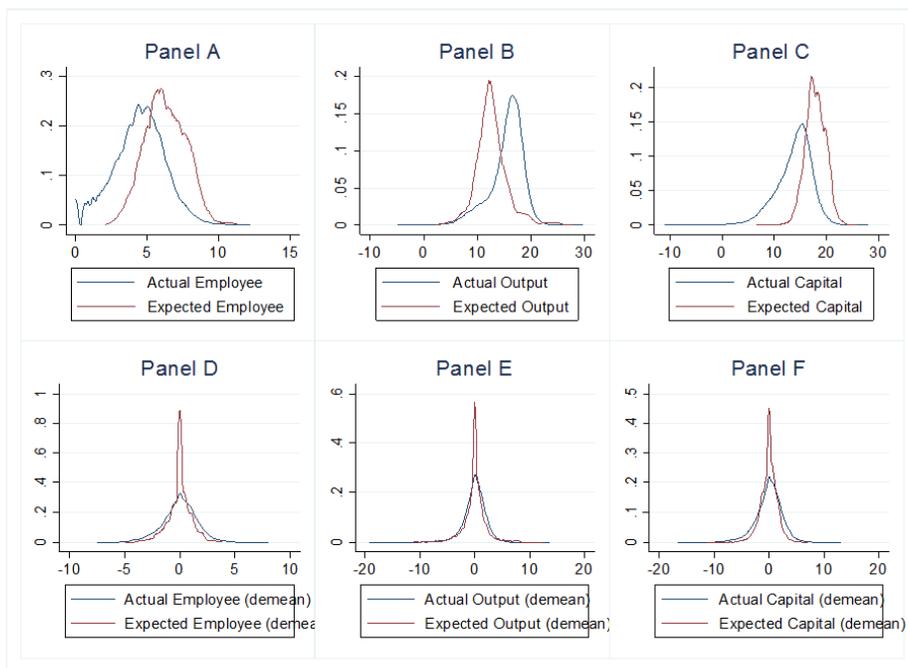
Figure 7: The distributions of expected and actual investments
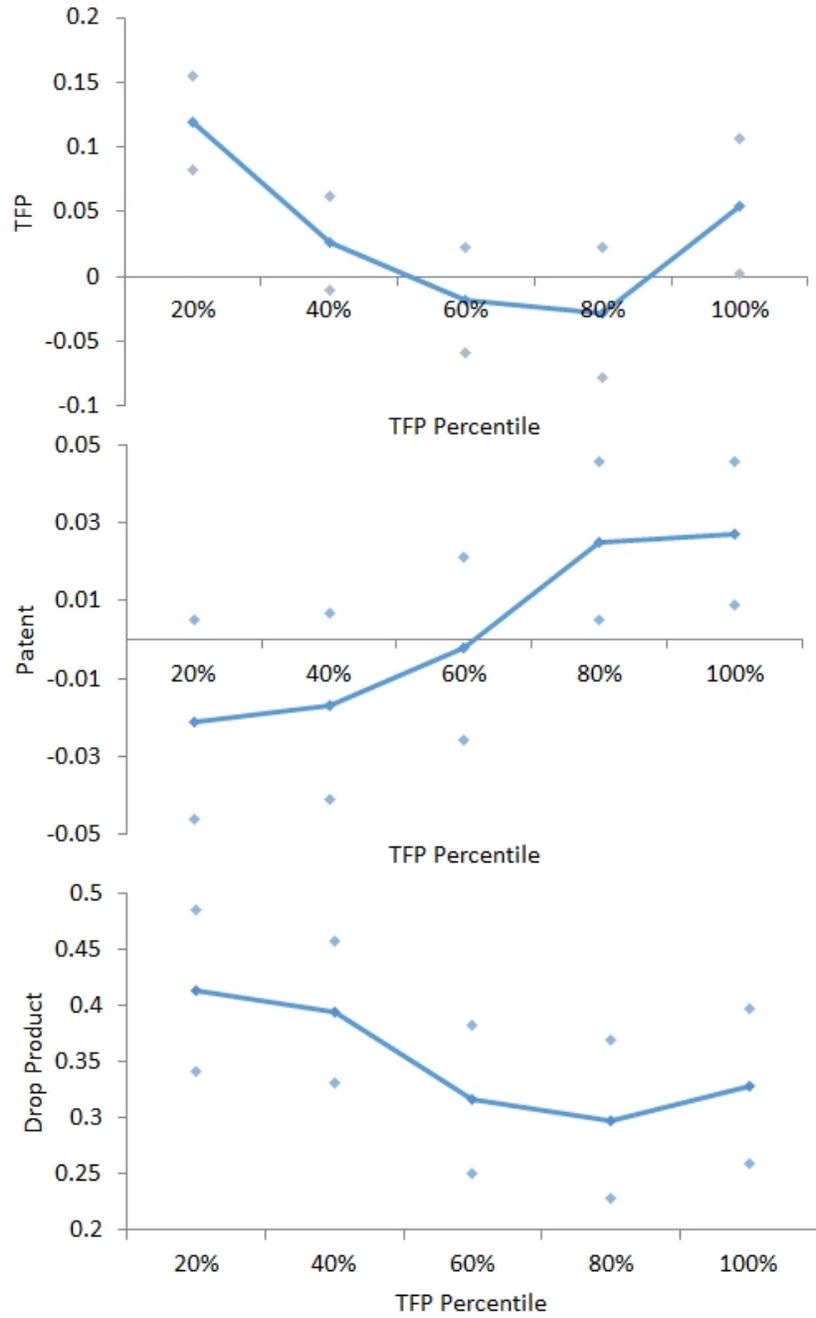
Figure 8: Estimated TFP, Innovation and Product Responses to FDI news by TFP percentile (Connected markers represent the coefficients; unconnected markers represent 95-percent confidence intervals)

Table 1: TFP Response to Local FDI News

Dependent variable	(1) TFP growth	(2) TFP growth	(3) TFP growth	(4) TFP growth	(5) TFP growth
Sample	All	All	All	All	All
FDI news (all)	0.003**		0.004**	0.002**	
	(0.001)		(0.001)	(0.001)	
FDI news (unique)					0.008***
					(0.003)
Actual FDI		-0.002	-0.003	-0.003	-0.003
		(0.002)	(0.002)	(0.002)	(0.002)
Domestic news				-0.001	-0.002
				(0.002)	(0.002)
Domestic sales growth				-0.054***	-0.054***
				(0.002)	(0.002)
Domestic sales growth square				0.009***	0.009***
				0.000	0.000
Size				0.011***	0.011***
				(0.001)	(0.001)
Capital intensity				0.004***	0.004***
				(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes	Yes	Yes
City-industry FE	Yes	Yes	Yes	Yes	Yes
Source	Full	Full	Full	Full	Full
Obs	1,651,624	1,651,624	1,651,624	1,446,413	1,446,413
R square	0.003	0.246	0.003	0.003	0.003

Notes: This table examines domestic firms' TFP responses to local FDI threats and actual FDI. The dependent variable is a domestic firm's log change of TFP. The variables "FDI news (all)" and "FDI news (unique)" are, respectively, the number of all or unique FDI news a firm faces in its industry and city. The variable "actual FDI" is the number of actual entry a firm faces across its industry and city. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 2: Firm-Specific Exposure to FDI News and TFP Response: Baseline Results

	(1)	(2)	(3)	(4)
Dependent variable	TFP growth	TFP growth	TFP growth	TFP growth
Sample	All	All	All	All
FDI news (all)	0.004***		0.006***	
	(0.002)		(0.002)	
FDI news (unique)				0.049***
				(0.017)
Actual FDI		0.002	-0.003	-0.003
		(0.007)	(0.007)	(0.007)
Domestic news			0.013	0.014
			(0.011)	(0.011)
Size			0.116***	0.116***
			(0.001)	(0.001)
Capital intensity			0.035***	0.035***
			(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes	Yes
Source	Full	Full	Full	Full
Obs	1,653,699	1,653,699	1,609,542	1,609,542
R square	0.336	0.336	0.350	0.350

Notes: This table examines domestic firms' TFP responses to firm-specific measures of FDI threats and actual FDI. The dependent variable is a domestic firm's log change of TFP. The variables "FDI news (all)" and "FDI news (unique)" are, respectively, the average number of all or unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 3: Firm-Specific Exposure to FDI News and TFP Response: Different Data Samples

Dependent variable	(1) TFP growth	(2) TFP growth	(3) TFP growth	(4) TFP growth
Sample	Non-China	Non-China	China	China
FDI news (all)	0.018**		0.008***	
	(0.010)		(0.002)	
FDI news (unique)		0.064**		0.058***
		(0.035)		(0.022)
Actual FDI	-0.004	-0.004	0.011	0.014
	(0.007)	(0.007)	(0.037)	(0.037)
Domestic news	-0.037	-0.037	0.023*	0.024*
	(0.026)	(0.026)	(0.013)	(0.013)
Size	0.099***	0.099***	0.293***	0.293***
	(0.001)	(0.001)	(0.003)	(0.003)
Capital intensity	-0.012***	-0.012***	0.301***	0.301***
	(0.001)	(0.001)	(0.003)	(0.003)
Firm FE	Yes	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes	Yes
Source	Orbis	Orbis	NBS	NBS
Obs	1,223,017	1,223,017	386,525	386,525
R square	0.266	0.266	0.569	0.569

Notes: This table examines domestic firms' TFP responses to firm-specific measures of FDI threats and actual FDI in Chinese and non-Chinese data samples. The dependent variable is a domestic firm's log change of TFP. The variables "FDI news (all)" and "FDI news (unique)" are, respectively, the average number of all or unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 4: TFP Response to FDI News: The Size of Threat

	(1)	(2)	(3)
Dependent variable	TFP growth	TFP growth	TFP growth
Sample	All	All	All
FDI news	-0.016	0.023	0.028
	(0,034)	(0.019)	(0.020)
* ave investment value	0.008**		
	(0.003)		
* ave expected employment		0.016*	
		(0.009)	
* ave expected output			0.004
			(0.005)
Actual FDI	-0.003	-0.003	-0.003
	(0.007)	(0.007)	(0.007)
Domestic news	0.013	0.014	0.012
	(0.011)	(0.011)	(0.011)
Size	0.116***	0.116***	0.116***
	(0.001)	(0.001)	(0.001)
Capital intensity	0.035***	0.035***	0.035***
	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	1,609,535	1,609,480	1,609,507
R square	0.350	0.350	0.350

Notes: This table examines domestic firms' TFP responses to FDI threats taking into account the size of threat. The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 5: Innovation, Investment and Wage Responses to FDI News

	(1)	(2)	(3)
Dependent variable	Patent growth	Investment growth	Wage growth
Sample	All	All	All
FDI news	0.014*	0.105**	0.010*
	(0.008)	(0.047)	(0.006)
Actual FDI	-0.002	-0.068	0.005
	(0.002)	(0.085)	(0.005)
Domestic news	-0.006	0.041	0.005
	(0.010)	(0.031)	(0.004)
Size	-0.002***	-0.097***	0.103***
	(0.000)	(0.005)	(0.001)
Capital intensity	-0.002***	-0.057***	-0.072***
	(0.000)	(0.005)	(0.001)
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	1,824,538	929,367	2,179,540
R square	0.128	0.165	0.272

Notes: This table examines domestic firms' innovation, investment and wage responses to FDI news. The dependent variables are the log changes of patent applications, investment, and average wage rate, respectively. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 6: Product Composition Responses to FDI News

	(2)	(3)	(4)
	Add product	Drop product	Switch
Dependent variable			
Sample	All	All	All
FDI news	0.011	0.285***	0.094***
	(0.028)	(0.029)	(0.029)
Actual FDI	0.002	0.174***	0.128***
	(0.013)	(0.013)	(0.017)
Domestic news	-0.009	-0.016	0.007
	(0.014)	(0.014)	(0.019)
Size	0.003***	0.006***	-0.001***
	(0.000)	(0.000)	(0.000)
Age	0.0001***	0.0001***	0.0001***
	(0.000)	(0.000)	(0.000)
Product count FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	4,047,684	4,047,684	4,047,684
R square	0.485	0.453	0.518

Notes: This table examines domestic firms' product composition responses to FDI news. The dependent variables are indicators of whether a firm adds a product, drops a product, and switches its primary product, respectively. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 7: Responses to FDI News in Chinese Data Sample

	(1)	(2)
Dependent variable:	RD growth	Add product
Sample	China	China
FDI news	0.020***	0.022***
	(0.007)	(0.005)
Actual FDI	-0.013	-0.016
	(0.013)	(0.010)
Domestic news	0.018***	0.007*
	(0.005)	(0.004)
Size	0.068***	0.053***
	(0.001)	(0.000)
Capital intensity	0.036***	0.027***
	(0.001)	(0.000)
Firm FE	Yes	Yes
City-industry-year FE	Yes	Yes
City-industry cluster	Yes	Yes
Source	NBS	NBS
Obs	590,448	818,690
R square	0.065	0.048

Notes: This table examines domestic firms' innovation and product responses to FDI news using Chinese NBS data. The dependent variables are an indicator of whether a firm performs new RD and an indicator of whether a firm reports adding new products, respectively. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 8: Heterogeneous TFP Responses to FDI News across Firms

	(1)	(2)	(3)
Dependent variable	TFP growth	TFP growth	TFP growth
Sample	All	Non-China	China
FDI news	0.100***	-0.016	0.038**
	(0.017)	(0.046)	(0.019)
* Lagged TFP	-0.123***	-0.053**	-0.049**
	(0.016)	(0.027)	(0.022)
* Lagged TFP square	0.026***	0.019***	0.029***
	(0.004)	(0.007)	(0.009)
Lagged TFP	-0.808***	-0.737***	-1.187***
	(0.001)	(0.001)	(0.003)
Actual FDI	0.004	0.001	0.074***
	(0.005)	(0.005)	(0.025)
Domestic news	0.002	-0.015	0.002
	(0.003)	(0.021)	(0.009)
Size	0.002***	0.001	0.001
	(0.001)	(0.001)	(0.002)
Capital intensity	-0.015***	-0.031***	-0.014***
	(0.001)	(0.001)	(0.002)
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Orbis	NBS
Obs	1,595,142	1,209,394	385,748
R square	0.616	0.543	0.809

Notes: This table reports domestic firms' heterogeneous TFP response to FDI news across firms. The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 9: Heterogeneous Innovation and Product Composition Responses to FDI News across Firms

	(1)	(2)	(3)
Dependent variable:	Patent growth	Drop product	Switch product
Sample	All	All	All
FDI news	-0.020	0.423***	0.141***
	(0.013)	(0.034)	(0.046)
*Lagged TFP	0.002***	-0.009***	-0.003
	(0.001)	(0.002)	(0.003)
Lagged TFP	0.0004	0.005***	0.003***
	(0.0006)	(0.000)	(0.000)
Actual FDI	-0.006	0.239***	0.149***
	(0.003)	(0.013)	(0.047)
Domestic news	-0.022***	-0.004	-0.000
	(0.007)	(0.014)	(0.018)
Size	-0.002***	0.008***	-0.001***
	(0.000)	(0.000)	(0.000)
Firm FE	Yes	No	No
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Orbis	Orbis	Orbis
Obs	1,256,648	4,047,684	4047692
R square	0.124	0.441	0.517

Notes: This table reports domestic firms' heterogeneous innovation and product composition response to FDI news within each industry. The dependent variable is the log change of patent applications and indicators of whether a firm drops a product and switches its primary product, respectively. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 10: Global Direct Competitors' Responses to FDI News

	(1)	(2)
Dependent variable	TFP growth	Advertising growth
Sample	Top firms	Top firms
FDI news by direct competitors	-0.049	0.011**
	(0.085)	(0.004)
Ever threatened by director competitors	0.032	-0.003
	(0.046)	(0.002)
Size	(0.014)	0.000
	(0.011)	(0.001)
Capital intensity	0.015	0.000
	(0.015)	0.000
Age	0.000	0.000
	(0.001)	(0.001)
City-industry-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	2,238	2,234
R square	0.748	0.658

Notes: This table reports global top direct competitors' response to FDI news. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 11: Heterogeneous Firm Responses to FDI News by Firm Type

	(1)	(2)	(3)	(4)
Dependent variable	TFP growth	TFP growth	TFP growth	TFP growth
Sample	Single-plant	Multi-product	Non-exporting	Non-MNC
FDI news (unique)	0.071***	0.059**	0.055***	0.060*
	(0.037)	(0.029)	(0.020)	(0.036)
Actual FDI	-0.001	0.010	(0.004)	(0.004)
	(0.007)	(0.012)	(0.007)	(0.007)
Domestic news	-0.005	0.036**	0.007	-0.035
	(0.028)	(0.016)	(0.013)	(0.027)
Size	0.105***	0.109***	0.114***	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)
Capital intensity	-0.011***	0.012***	0.027***	-0.011***
	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes	Yes
Source	Full	Full	Full	Full
Obs	1,146,186	628,772	1,375,033	1,190,852
R square	0.267	0.292	0.351	0.266

Notes: This table reports heterogeneous firm response to FDI news by firm type. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 12: Heterogeneous TFP Responses to FDI News across Industries

	(1)	(2)
Dependent variable	TFP growth	TFP growth
Sample	All	All
FDI news	0.050*	0.009
	(0.028)	(0.007)
*TFP ave. distance to frontier	-0.008**	
	(0.004)	
*TFP skewness		-0.012*
		(0.007)
Actual FDI	-0.001	-0.001
	(0.003)	(0.003)
Domestic news	0.006	0.005
	(0.004)	(0.004)
Size	0.117***	0.116***
	(0.001)	(0.001)
Capital intensity	0.036***	0.035***
	(0.001)	(0.001)
Firm FE	Yes	Yes
City-industry-year FE	Yes	Yes
City-industry cluster	Yes	Yes
Source	Full	Full
Obs	1,499,977	1,602,222
R square	0.345	0.350

Notes: This table reports domestic firms' heterogeneous TFP response to FDI news across industries depending on their levels of "neck-to-neckness". The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 13: Heterogeneous TFP Responses to FDI News across Countries

	(1)	(2)
Dependent variable	TFP growth	TFP growth
Sample	All	All
FDI news		
- Developing host countries	0.043**	
	(0.018)	
- Developed host countries	0.077*	
	(0.042)	
- Developing source countries		-0.002
		(0.033)
- Developed source countries		0.043**
		(0.017)
Actual FDI	-0.003	-0.004
	(0.007)	(0.005)
		0.005
Domestic news	0.013	0.007
	(0.011)	(0.010)
Size	0.116***	0.202***
	(0.001)	(0.001)
Capital intensity	0.035***	0.032***
	(0.001)	(0.001)
Firm FE	Yes	Yes
City-industry-year FE	Yes	Yes
City-industry cluster	Yes	Yes
Source	Full	Full
Obs	1,609,542	1,609,542
R square	0.350	0.350

Notes: This table reports heterogeneous TFP responses to FDI news in developed v.s. developing countries. The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 14: The Content of News: FDI Motives

Dependent variable	(1) TFP growth	(2) RD growth	(3) Investment growth
Sample	News with info	News with info	News with info
FDI news (local market)	0.145***	0.358**	0.385***
	(0.031)	(0.177)	(0.144)
FDI news (export market)	0.003	-0.111	-0.307
	(0.143)	(0.276)	(0.292)
Actual FDI count	0.051**	0.081	-0.079
	(0.022)	(0.107)	(0.084)
Domestic news	0.004	0.098**	0.038
	(0.007)	(0.043)	(0.030)
Size	0.050***	-0.042***	-0.092***
	(0.002)	(0.009)	(0.005)
Capital intensity	-0.021***	-0.009	-0.057***
	(0.002)	(0.007)	(0.005)
Age			
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	601,707	437,643	919,643
R square	0.444	0.398	0.011

Notes: This table examines domestic firms' TFP response to the information embodied in the news, specifically, information on the motives (target markets) of FDI. The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 15: Placebo Test: Timing of FDI News

	(1)	(2)	(3)	(4)
Dependent variable	TFP growth	TFP growth	TFP growth	TFP growth
Sample	All	All	All	All
Placebo	One year earlier	One year later	6 months earlier	6 months later
Placebo FDI news	-0.002	-0.001	0.016	0.036
	(0.003)	(0.002)	(0.016)	(0.013)
Actual FDI	-0.002	-0.002	-0.004	-0.004
	(0.007)	(0.007)	(0.005)	(0.005)
Domestic news	0.014	0.013	0.006	0.007
	(0.011)	(0.011)	(0.010)	(0.010)
Size	0.115***	0.115***	0.202***	0.202***
	(0.001)	(0.001)	(0.001)	(0.001)
Capital intensity	0.034***	0.034***	0.032***	0.032***
	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes	Yes
Source	Full	Full	Full	Full
Obs	1,609,542	1,609,542	1,609,542	1,609,542
R square	0.350	0.350	0.350	0.350

Notes: This tablet reports falsification tests where FDI news were assumed to occur either a year or 6 months earlier or later than the actual date. The dependent variable is a domestic firm's log change of TFP. The variable "Placebo FDI news" is the average number of unique FDI news a firm faces across its products assuming the news had been published 1 year or 6 months earlier or later. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 16: IV Analysis: Narrative Weekend News

	First Stage
	(1)
Dependent variable	Weekday FDI news
Sample	City-industry-year
IV: Weekend narrative news	1.694***
	(0.003)
Actual FDI	0.030***
	(0.001)
Domestic news	0.114***
	(0.001)
Domestic sales growth	0.000
	(0.000)
Domestic sales growth square	-0.000
	(0.000)
Region-industry-year FE	Yes
City-year FE	Yes
City-industry cluster	Yes
Source	Full
Obs	814,331
R square	0.273

	Second Stage	
	OLS	IV
Dependent variable	TFP growth	TFP growth
Sample	All	All
Weekday FDI news	0.006*	0.011*
	(0.004)	(0.007)
Actual FDI	-0.007	-0.008
	(0.007)	(0.007)
Domestic news	0.007	0.006
	(0.010)	(0.011)
Size	0.135***	0.135***
	(0.001)	(0.001)
Capital intensity	0.048***	0.048***
	(0.001)	(0.001)
Firm FE	Yes	Yes
City-industry-year FE	Yes	Yes
City-industry cluster	Yes	Yes
Source	Full	Full
Obs	1,666,634	1,649,104
R square	0.435	0.436

Notes: This table reports the IV analysis where weekday FDI news are instrumented by weekend narrative FDI news. The dependent variable is a domestic firm's log change of TFP. "Weekday FDI news" refers to all (including unique and duplicate) FDI-focused news published on weekdays. "Weekend narrative news" refers to news that contain information about a future FDI activity but are published on weekends and do not focus on FDI. In the TFP analysis, all variables on the right hand side are lagged by one year and all regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 17: IV Analysis: Alternative Types of News

	First Stage		
	(1)	(2)	(3)
Dependent variable	FDI news	FDI news	FDI news
Sample	City-industry-year	City-industry-year	City-industry-year
IV: City politics news*city share of industry	0.109***		-0.026***
	(0.021)		(0.003)
IV: City election news*city share of industry		0.332***	
		(0.094)	
IV: City sport news*city share of industry			
Actual FDI	0.020***	0.023***	0.026***
	(0.007)	(0.007)	(0.008)
Domestic news	0.339***	0.342***	0.343***
	(0.051)	(0.051)	(0.051)
Domestic sales growth	0.011***	0.011***	0.011***
	(0.001)	(0.001)	(0.001)
Domestic sales growth square	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
City-year FE	Yes	Yes	Yes
City-industry FE	Yes	Yes	Yes
Country-industry-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	207,057	207,057	207,057
R square	0.042	0.042	0.041
	Second Stage		
Dependent variable	TFP growth	TFP growth	TFP growth
Sample	All	All	All
FDI news	0.029**	0.030*	0.031**
	(0.015)	(0.016)	(0.006)
Actual FDI	(0.010)	(0.010)	-0.01
	(0.007)	(0.007)	(0.007)
Domestic news	(0.001)	(0.001)	-0.002
	(0.012)	(0.012)	(0.011)
Size	0.144***	0.144***	0.135***
	(0.001)	(0.001)	(0.001)
Capital intensity	0.057***	0.057***	0.057***
	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	981,142	981,142	981,142
R square	0.23	0.23	0.05

Notes: This table reports the IV analysis where weekday FDI news are instrumented by alternative types of local news. The dependent variable is a domestic firm's log change of TFP. In the TFP analysis, all variables on the right hand side are lagged by one year and all regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 18: TFP Response to FDI News: Alternative Productivity Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Labor prod. growth		Solow prod. growth		Olley-Pake prod. growth	
Sample	All	All	All	All	All	All
FDI news (all)	0.008***		0.007***		0.006***	
	(0.002)		(0.002)		(0.002)	
FDI news (unique)		0.034***		0.033***		0.048***
		(0.012)		(0.016)		(0.017)
Actual FDI	0.002	0.002	-0.002	-0.003	-0.003	-0.003
	(0.008)	(0.008)	(0.011)	(0.011)	(0.007)	(0.007)
Domestic news	0.019*	0.019*	0.021	0.022	0.013	0.014
	(0.010)	(0.010)	(0.014)	(0.014)	(0.011)	(0.011)
Size	0.171***	0.171***	0.067***	0.067***	0.118***	0.067***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Capital intensity	-0.138***	-0.138***	0.347***	0.347***	0.035***	0.035***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes	Yes	Yes	Yes
Source	Full	Full	Full	Full	Full	Full
Obs	1,987,960	1,987,960	2,025,630	2,025,630	1,609,799	1,609,799
R square	0.381	0.381	0.413	0.413	0.351	0.351

Notes: This table examines domestic firms' TFP responses to firm-specific measures of FDI threats and actual FDI in Chinese and non-Chinese data samples. The dependent variable is a domestic firm's log change of TFP. The variables "FDI news (all)" and "FDI news (unique)" are, respectively, the average number of all or unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 19: Additional Robustness Analysis

	(1)	(2)	(3)
Robustness	Normalized news	Top countries by publications	Top countries by firms
Dependent variable	TFP growth	TFP growth	TFP growth
Sample	All	All	All
FDI news	0.964***	0.050***	0.051***
	(0.338)	(0.018)	(0.018)
Actual FDI	-0.003	0.015	-0.001
	(0.007)	(0.017)	(0.007)
Domestic news	0.014	0.022*	0.014
	(0.011)	(0.011)	(0.011)
Size	0.116***	0.153***	0.118***
	(0.001)	(0.002)	(0.001)
Capital intensity	0.035***	0.186***	0.039***
	(0.001)	(0.002)	(0.001)
Firm FE	Yes	Yes	Yes
City-industry-year FE	Yes	Yes	Yes
City-industry cluster	Yes	Yes	Yes
Source	Full	Full	Full
Obs	1,609,542	557,970	1,473,447
R square	0.350	0.773	0.354

Notes: This table reports additional robustness analysis. The dependent variable is a domestic firm's log change of TFP. The variable "FDI news" is the average number of unique FDI news a firm faces across its products. The variable "actual FDI" is the average number of actual entry a firm faces across its products. All variables on the right hand side are lagged by one year. All regressions include firm and city-industry-year fixed effects. Standard errors are clustered at the city-industry level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table A.1: The Composition of FDI News

Form	Share	Motive	Share
Greenfield	0.68	Local market access	0.39
Mergers and acquisitions	0.07	Export platform	0.59
Joint venture	0.14	Comparative advantage	0.08
Country	Share	Credibility	Share
North-North	0.31	FDI with certainty	0.52
North-South	0.56	FDI with uncertainty	0.48
South-North	0.02		
South-South	0.11		

Notes: This table reports the share of FDI news in each category.

Table A.2: Summary Statistics

Variables	Source	Mean	Std. dev.	Min	Max	Format
Firm characteristics						
TFP growth	Orbis, NBS	0.04	0.37	-13.74	13.21	Log change
Patent growth	Orbis	0.001	0.07	-4.26	5.06	Log change
Investment growth	Orbis, NBS	-0.14	1.59	-14.91	12.67	Log change
Wage growth	Orbis, NBS	0.09	0.29	-8.32	8.52	Log change
Add product	Orbis	0.02	0.15	0.00	1.00	Binary
Drop product	Orbis	0.02	0.14	0.00	1.00	Binary
Switch primary product	Orbis	0.04	0.21	0.00	1.00	Binary
RD	NBS	0.12	0.32	0.00	1.00	Binary
New product	NBS	0.09	0.28	0.00	1.00	Binary
Firm size	Orbis, NBS	3.35	1.69	0.00	11.98	Log
Firm capital intensity	Orbis, NBS	2.08	1.39	-3.78	17.81	Log
FDI news and actual FDI (firm level)						
FDI news (all)	Factiva	0.02	0.29	0.00	35.00	Level
FDI news (unique)	Factiva	0.004	0.05	0.00	5.00	Level
Actual FDI	Orbis	0.006	0.07	0.00	4.00	Level
Domestic news	Factiva	0.004	0.09	0.00	19.00	Level
Investment value	Factiva	0.05	0.59	0.00	22.80	Log
Expected employment	Factiva	0.003	0.08	-0.08	9.05	Log
Expected output	Factiva	0.01	0.24	0.00	18.20	Log

Notes: This table reports the sources and the summary statistics of main variables.