When Foreign Rivals are Coming to Town: Firm Responses to Multinational Investment News

Cathy Ge Bao*
George Washington University

Maggie X. Chen†
George Washington University

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Abstract

How do domestic firms respond to the *threat* of foreign competition? This paper constructs a unique database of foreign investment news in 2001-2007 based on over 35,000 newspapers, trade press, magazines, newswires, and other forms of media in 200 countries and investigates the responses of domestic firms to the threat of new multinational investment. The analysis shows that domestic firms respond significantly to foreign investment news by increasing productivity, R&D, labor training, patent applications, product diversification, and advertising expense. The degree of response increases with the size of threats, the influence of news, and the amount of information on the credibility and the target market of investments. Further, the response exhibits substantial heterogeneity across domestic firms, observed primarily at the left and right tails of the productivity distribution, and top global competitors identified by investing multinationals respond only with greater local advertising effort. Across industries, firms are found to increase innovation in the presence of downstream FDI news. The main findings are robust to placebo tests and IV analysis that explore detailed characteristics—such as the timing and location, the primary market, and the substance—of each news.

JEL Codes: F1, F2, L2, D2
Key Words: Foreign Investment News, Threat, and Domestic Firm Responses

*Email: gebao@gwmail.gwu.edu.
†Corresponding Author. Email: xchen@gwu.edu.

1 Introduction

How do domestic firms respond to the *threat* of foreign competition? An extensive body of research assesses the impact of increased competition from globalization on the performance of domestic firms, but relatively little analysis has investigated the response of domestic firms to the threat of foreign competition, mainly due to the difficulties of identifying the threat separately from actual competition. Observed changes (or the lackof) among domestic firms, as a result, are often attributed to the externalities or the competition effects of actual foreign competition, even though strategic, preemptive actions could often lead to similar outcomes and represent a sharply different mechanism through which domestic firms respond to globalization.

In this paper, we disentangle domestic firm response to foreign competition threats from the effect of actual foreign competition by exploring time lags between the arrivals of foreign investment news and actual investments. We construct a unique dataset of foreign investment news based on Factiva, one of the largest global digital business aggregators and archives in the world. By searching key words in over 35,000 news sources including newspapers, trade presses, consumer magazines, newswires, press releases, television and audio transcripts, and web and social media from 200 countries, we identify and collect foreign-investment related news in 2001-2007. For each piece of news, we record the dates of news and actual investment to separate the anticipated threat of foreign competition from the arrival of actual competition. In addition, we document detailed investment characteristics, such as firms, countries, and industries involved, investment size, expected output and employment, entry form, and news characteristics, such as news content and news publisher and publication information, by carefully reading through the text of each news and collecting related information.

For example, in a December 2005 issue of *Wall Street Journal*, Toyota Motor Corp. announced that "it received permission from authorities to build a car plant near St. Petersburg, Russia." The news further stated that the car maker "plans to invest $140 million in the plant, the construction of which will start in the fourth quarter of 2006 and finish in mid-2007" and "will start production at 20,000 Camry models a year and gradually raise output to 50,000 a year." As another example, an October 2007 news article in *Shanghai Daily* announced that Continental AG "will invest US$216 million to build its first Chinese tire-making plant in Hefei, Anhui Province, to meet growing demand and to catch up with rivals like Japan's Bridgestone... 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."

These news enable us to identify an important time window between the announcement and the occurrence of foreign investments (December 2005-mid 2007 in the case of Toyota in St. Petersburg, Russia and October 2007-early 2010 in the case of Continental AG in Hefei, China). Exploring this unique information, we can then look at how domestic firms in affected industries (e.g., automobiles and tires in the above two examples) behave when faced with the

threat of foreign competition, specifically, after the arrival of competition news and before the actual occurrence of competition.

We investigate firm responses in both productivity and underlying mechanisms including innovation, skill upgrading, and product mix. To do so, 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' Annual Census of Enterprises. The cross-country firm panel dataset contains rich time-series financial, operation, and ownership information for over 2 million public and private manufacturing companies, which enables us to assess domestic firms' reactions to anticipated and realized foreign multinational competition in a variety of dimensions including productivity, innovation (proxied by R&D expenditure, staff training expense, and patent applications), and organization decisions (including product mix and advertising cost) and how the responses evolve in the time path preceding the actual entry of multinationals.

Our results indicate that domestic firms do respond significantly to the threat of foreign multinational competition. Domestic firms upgrade productivity when faced with the threat of foreign competition, especially threats with greater expected output and employment. The actual arrival of foreign investment, in contrast, is found to have weaker or no effect on productivity. In exploiting the underlying mechanisms of productivity response, we find domestic firms to increase R&D, staff training, patent applications, and advertising expense and diversify product mix immediately after the arrival of competition news. The extent of domestic productivity upgrading also increases with the influence of news. To quantify the influence of each news, we collect the publication title and the news agency of each news piece, the location of news agencies and publications, and the word count of each news and obtain the circulation volume of each publication title from data sources such as Ulrich, News Bank's Access World News, and Audit Bureau of Circulation. We find that domestic firms exhibit stronger TFP response to more influential news with a larger readership. Domestic firms are also shown to respond only to local and internationally known news publications; FDI news reported by foreign local news sources have no effect on domestic firms' behavior.

Given our goal to establish the role of information in firm behavior, we also explore the 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 the substance of the 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. Domestic firms are shown to respond only to FDI news where the investments are described to occur unambiguously and not to FDI news where the descriptions reveal uncertainties and contingencies in foreign investments. Second, we document the motives of foreign investments (e.g., whether the new subsidiary of foreign MNCs seeks to serve primarily local or export markets) reported in the news. We find that news of local-market seeking FDI

lead to significant domestic TFP upgrading whereas news of export-platform FDI and news that do not provide any target market information do not exert any effect on domestic firms' TFP.

Response to FDI news exhibits great heterogeneity across firms. We find domestic firms at the right and left tails of the TFP distribution tend to respond significantly to the news by upgrading TFP while domestic firms with intermediate TFP levels show little reactions. Incorporating a unique dataset from Orbis that reports top direct competitors of MNCs with Chinese Annual Census of Enterprises, 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 (e.g., GM's existing subsidiary in China) and how the responses of the top competitors might differ from those of average domestic competitors (e.g., Chinese auto makers). Our analysis shows that top competitors, most of which are multinationals themselves, do not adjust their TFP (or innovation) decisions, but instead increase advertising effort in response to FDI news.

In the analysis, we account for all time-variant city and country factors with the control of city-year and country-industry-year fixed effects and each city's industry-specific market growth. However, plausible concerns could still arise in the identification of the effect of FDI news. First, it is possible that the estimated effect of FDI news reflects a city's productivity and overall economic growth trends (e.g., productivity boom in Bangalore's IT industry in the recent decade). Put differently, FDI going to cities that have been experiencing economic booms in certain industries could attract greater media attention and have a greater probability of being reported. Second, the reporting of FDI news might be correlated with a city's unobservable contemporaneous shocks (that are not already controlled for by the city-year dummies and city-industry sales growth), such as the city's new industry policy which might influence the news preferences of local news agencies.

We take two separate approaches to address the above two concerns. First, we consider a placebo test by exploiting the specific timing of FDI news and assuming each FDI news had been published a year earlier. If FDI news indeed capture a local productivity trend, the slight forward adjustment in the timing of news should lead to relatively small changes in the estimates. If, instead, the concern does not apply, FDI news, when assumed to occur before the actual news, should not result in any responses from domestic firms. Our placebo test result is consistent with the latter. We also perform additional falsification test by investigating the effect of FDI news on other performance outcomes such as profit growth. If indeed FDI news reflect local industry-specific economic growth trends (for instance, FDI news are reported because of domestic demand boom), we should expect an immediate positive correlation between FDI news and other firm-level growth variables such as profit growth. This hypothesis is not supported in the data. These results offer us further assurance that the estimated effect of FDI news is unlikely to have captured local economic growth trends.

To address the concern that the reporting of FDI news is correlated with a city's unobservable contemporaneous productivity shocks in a given industry (which might be observable to

Shanghai's local newspapers and motivate them to report more auto-related local news), we consider an Instrumental Variable (IV) approach where we instrument local FDI news with FDI news reported by foreign local news sources. As discussed earlier, we find no significant correlations between domestic firms' TFP growth and FDI news published by foreign local news sources (e.g., the productivity growth of auto firms in Shanghai is positively correlated with Shanghai's foreign investment news published by Chinese and major international news sources such as Shanghai Daily and Financial Times, but not with those published by local foreign news sources such as the Detroit News). This motivates us to assume that the FDI reporting by local news publications (publications catering primarily local readers) (i) is more likely to be driven by local news supply (e.g., inward or outward FDI activities by local companies); (ii) has little direct influence on the behavior of foreign readers (as shown in the data). However, FDI news reported by local news sources from different countries might be correlated because of information flow. Hence, based on these considerations, FDI news reported by local news sources in another country could serve as a plausible IV for FDI news reported by the FDI host country's local news sources. Our analysis shows that the estimated effect of FDI news remains robust.

In the rest of the analysis, we perform additional analysis to further examine the robustness of our results (e.g., focusing on countries with comprehensive news coverage to account for the potential large news bias) and additional aspects of domestic economy's response to FDI news (e.g., responses to FDI news in upstream and downstream industries and across the country). We find our main results remain similar and in addition significant domestic firm reactions to FDI news in downstream industries and other domestic cities.

Our paper is related to an extensive empirical literature in international trade that assesses the effects of (actual) foreign multinational competition on domestic firm performance. In particular, many studies have shed important light on potential productivity externalities generated by foreign multinational firms; see, for example, Aitken and Harrison (1999), Javorcik (2004), Keller and Yeaple (2009), Arnold and Javorcik (2009), Arnold, Javorcik and Mattoo (2011), Guadalupe et al. (2011), Fernadez and Paunov (2012), Aghion et al. (2012), and many others. While overwhelming evidence suggests positive productivity spillovers between industries with vertical production linkages (see, for example, the leading work of Javorcik, 2004; Arnold, Javorcik and Mattoo, 2011; Fernadez and Paunov, 2012), evidence on within-industry productivity spillovers tends to be mixed. Earlier studies by Aitken and Harrison (1999) and Javorcik (2004) find little or negative spillovers from foreign multinationals to domestic firms within the same industry while more recent work by Keller and Yeaple (2009), Arnold and Javorcik (2009), Guadalupe et al. (2011), and Aghion et al. (2012) shows evidence of positive productivity effects. Alfaro and Chen (2013) disentangle between the effects of productivity spillover and competition (market reallocation) by exploring their distinct predictions for domestic firms' productivity and revenue distributions and find both to be important sources of domestic productivity gains.

More broadly, the paper is related to the empirical trade literature that examines domestic firms' responses to trade liberalization. A comprehensive review of this literature is beyond the scope of our paper; we focus instead on a few studies in the area. The pioneering work by Pavnick (2002) uses plant-level panel data on Chilean manufacturers to show significant within-plant productivity improvements following Chilean trade liberalization. She also finds reallocations of resources and output from less to more efficient producers to constitute an important source of aggregate productivity gains. More recently, Lileeva and Trefler (2010) investigate the effect of U.S. tariff cuts on Canadian plants' export and innovation decisions and find lower-productivity Canadian plants that were induced by the tariff cuts to start exporting tend to increase labor productivity and product innovation. Exploring the impact of MERCOSUR, Bustos (2011) shows that Argentinean firms in industries facing higher reductions in Brazil's tariffs increase technology investment faster. These two analyses offer unique evidence on domestic firms' productivity upgrading in response to new export-market opportunities. Bloom, Draca and Van Reenen (2012) examine the impact of Chinese import competition on European firms' technology behavior including patenting, IT, R&D, TFP and management practices and find that innovation increases within firms most affected by Chinese imports.

Our paper complements the above literature by investigating the effect of competition threats. We distinguish between the preemptive actions of domestic firms and the effects (including both externalities and competition effects) of actual foreign competition and show that the latter is not the only link that connects foreign competition with domestic firm performance. Domestic responses could initiate before the actual arrival of competition, because of anticipation of future competition informed by, in our context, news of foreign investments. This strategic, self response to competition threats represents an under-emphasized, but crucially important mechanism through which globalization affects domestic economies, accounting for, in our analysis, essentially all the domestic productivity growth associated with multinational competition. Our analysis also shows how anticipated foreign competition threats affect domestic firms' behavior in a rich set of dimensions to understand the mechanisms through which threats might stimulate productivity upgrading. Further, exploring unique detailed characteristics of our primary treatment (such as the timing and location, the content, and the influence of each FDI news) enables us to employ various strategies to identify the treatment effect.

The rest of the paper is organized as follows. Section 2 describes the methodology and the process employed in constructing the foreign investment news dataset and the information as well as the patterns embodied in the data. Section 3 discusses the supplementary cross-country firm-level financial, ownership, and operation data. Sections 4 and 5 report the baseline econometric evidence and sensitivity analysis, respectively. Section 6 provide additional empirical evidence and discussion. The paper concludes in Section 7.

2 A New Database of Foreign Investment News

In this section, we describe the source and the process employed to construct the database of foreign investment news and the detailed information collected.

2.1 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 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 & audio clips, web media, and social media, from 200 countries in 28 languages. Top examples include the Wall Street Journal, the New York Times (newspapers); the Oil and Gas Journal, Automotive News (trade press); Dow Jones Newswire, AFP (newswires); PR Newswire, Business Wire (press releases); ABC News – Good Morning America, Deutsch 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, also gives access to major newspapers from around the world as well as industry and market news sources in 16 languages. 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 only. The advantage of LexisNexis Academic is its access to U.S. and international law documents, which are outside of our research interest. Similar to LexisNexis Academic News, ABI/Inform Complete Plus consists of primarily the largest publishers' publications in the U.S. and Europe. Given our goal of collecting news information from not only prime but also local channels, we adopt Factiva as the primary data source.

2.2 Methodology

The following specifications are employed in our data search process. We limit the search to the period of January 1, 2000-December 31, 2007.[1] 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.

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

We search 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). This results in 146,663 investment-related news pieces from all over the world. We then screen the text, in particular, the text around the keywords to identify news of investments. Investment news that contain "plan to", "agree to", "say they will", "sign an agreement", "expect", "consider", and etc. are considered and kept as news of future investments. To distinguish between domestic and foreign investment, we perform a background check on companies in the news as most news articles do not indicate the source country of investments. We identify the home country and the host country of each firm with the announced investment. This step leaves us 16,911 news pieces.

2.3 Investment and News Characteristics

We collect detailed investment and news characteristics by carefully reading through each piece of foreign investment announcement news. The following list of information is included in the data.

Investment Information

1. *Multinational firm*: the firm that undertakes 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. *Announcement date*: the date on which the investment was announced.
3. *Start year*: the expected production starting year.
4. *Investment country*: the country where the multinational firm will invest. There are 138 host countries in our final sample.
5. *Investment state/province*: the state where the multinational firm will invest.
6. *Investment city/town*: the city where the multinational firm will 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 investment is a new entry or an expansion of an existing investment.
8. *Investment industry*: the primary industry in which the subsidiary will operate. It is also the industry in which domestic firms will compete with the foreign multinational firm. 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 industry information is not given, we search company information from other sources to identify the primary industry.

9. *Investment value and currency*: the 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 new subsidiary.
12. *Investment form*: whether the investment is greenfield, M&A or joint venture.
13. *Investment contingency*: the contingency of the investment such as "*subject to government approval".*
14. *Investment motive*: the motive of the 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-platfom FDI news.
15. *Expected consumer market*: related to the investment motive, the targeted consumer market of the 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 new 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 collect circulation data to measure their influences. The circulation data are obtained from the following sources: 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 news agency. When the news source is an news agency, a journalist organization established to supply news reports to news organizations like newspapers, magazines, and radio and television broadcasters, circulation data would not be available. In this case, we identify established national news agencies.

2.4 Foreign Investment News Patterns

(To be completed)

3 Cross-Country Firm Financial and Operation Data

We supplement the investment news dataset with a cross-country firm-level panel dataset drawn from Orbis and Chinese National Bureau of Statistics' Survey of Industrial Firms.

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 Register of Accounts. Over 99 percent of the companies included in the database are private. The database reports for each company: a) detailed 10-year financial information including 26 balance sheet and 25 income sheet items; b) industries and activities including primary and secondary industry codes in both local and international classifications; c) corporate structure including board members and management; d) 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 a variety of dimensions such as total factor productivity, employment, unit labor cost, R&D, and product compositions. 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 registers, 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 another interesting dimension of firm response as changes in domestic firms' patent applications could reflect either changes in innovation activities or strategic patenting decisions. Fourth, Orbis reports top direct competitors for a subset of firms, most of which are multinationals around the world. We exploit this information to assess how FDI news affect the behavior of top direct competitors differently than average domestic firms.

To expand data coverage in China, the top host country that accounts for over half of the FDI news, we supplement Orbis with the Annual Census of Enterprises by the Chinese National Bureau of Statistics from 2001 to 2007. The Annual Census of Enterprises contains manufacturing firms with sales above 5 million RMB. In 2001, there are around 170,000 firms surveyed and

the number increases to more than 300,000 in 2007. The dataset reports comprehensive financial and operation information including sales, gross output value, asset, liability, cost, profit, number of employees, material cost, R&D expense, staff training cost, advertising expenditure, labor cost, new product value, and etc. It allows us to estimate TFP and examine several other unique firm response variables such as R&D expense, staff training cost, and advertising expenditure. 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. The dataset covers both state-owned enterprises and private companies in 22 provinces, five autonomous regions and four direct-controlled municipalities and reports detailed location information. By exploring the capital shareholder information, we are also able to identify the ownership structure of each firm.

Our final sample consists of over 2 million manufacturing firms for the period of 2002-2007 and two main categories of information for each firm: (i) financial and operation information including revenue, value added, employment, labor cost, fixed asset, material cost, profit margin, R&D expenditure, staff training cost, and advertising expenditure (when available); (ii) product information including the 4-digit SIC codes of the primary and secondary products in which each firm operates.[2] 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.

We use firms' financial data in the 2001-2007 period to derive estimates of production function for each 3-digit SIC industry and obtain productivity estimates.[3] 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) use a transformation of the firm's first-order condition for flexible inputs that does not require finding instrument 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. We report our primary results based on productivity estimates obtained using Ghandi et al.'s (2012) technique, but confirm that the findings are qualitatively similar when other estimation methods such as Levinsohn and Petrin (2003) and

[2] The final sample size varies with the variables examined.

[3] Revenue, asset, and material cost are deflated in the data. We obtained industry-level revenue, asset, and material cost deflators 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.

labor productivity are used.

4 Main Empirical Evidence

In this section, we present our main econometric results on how domestic firms respond to the threats of foreign multinational competition and actual competition, respectively.

4.1 Productivity Response: Baseline Results

We start with the following baseline empirical specification:

$$\begin{aligned} y_{i,k,t} &= \alpha + \beta_1 News_{city,k,t-1} + \beta_2 Actual\ entry_{city,k,t-1} + \gamma Z_{i,k,t-1} \\ &\quad + \mu Growth_{city,k,t-1} + \lambda_{city,t} + \lambda_{country,k,t} + \varepsilon_{i,k,t} \end{aligned} \tag{1}$$

where $y_{i,k,t}$ is the outcome of interest (e.g., log productivity growth) of firm i in industry k and year t, $News_{city,k,t-1}$ is either a dummy or a count of foreign investment news in the city where firm i is located, industry k, and year $t-1$, $Actual\ entry_{city,k,t-1}$ is either a dummy or a count of actual entry or expansion by foreign multinational firms in the respective city, industry, and year $t-1$, $Z_{i,k,t-1}$ is a vector of firm characteristics in $t-1$ including size (employment), capital intensity, and age, and $Growth_{city,k,t-1}$ represents the average sales growth of domestic firms in a given city, industry and $t-1$. In addition, we include a vector of city-year dummies and a vector of country-industry-year dummies to control for all time-variant city factors such as quality of infrastructure, human capital, and government regulations and all time-variant country-industry characteristics such as market demand and trade policies. A city-industry-year cluster is also used to allow for correlations of residuals within each city and industry at a given year.

The results for domestic firm TFP are summarized in Table 1. We find significant productivity upgrading by domestic firms in response to the threat of foreign multinational competition. If there was an investment news in year $t-1$, the TFP would grow by 1 percent in year t. The effect of actual multinational entry, in contrast, is statistically insignificant. The number of investment news as well as the number of foreign MNCs that are involved in the news also play a significant role in firm TFP response. Each additional foreign investment news and each additional MNC that is expected to investment in the host country are associated with 0.2 and 0.6 percent increases in TFP, respectively.

[Table 1 inserted here]

We also examine domestic productivity response using labor productivity (table 2). The threat of foreign multinational competition reported in year $t-1$ leads to 0.7 percent increase in domestic firms' labor productivity in the following year (even though news count does not appear to have a significant effect), whereas actual multinational investment increases labor

productivity by 0.5 percent. These results suggest that domestic firms' productivity upgrading in response to the threats of multinational competition exceeds the productivity improvement following the actual investment of multinational firms.

[Table 2 inserted here]

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

$$\begin{aligned} y_{i,k,t} &= \alpha + \beta_1 News_{city,k,t-1} + \beta_2 News_{city,k,t-1} \times Threat\ size_{city,k,t-1} \\ &\quad + \beta_3 Actual\ entry_{city,k,t-1} + \gamma Z_{i,k,t-1} + \lambda_{city,t} + \mu Growth_{city,k,t-1} + \mu_{country,k,t} + \varepsilon_{i,k,t} \end{aligned} \tag{2}$$

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

As reported in Table 3, we find the response of domestic firms to increase significantly with the size of threats. Future multinational competition with greater expected output and employment motivates a steeper productivity upgrading by domestic firms. For example, a 100-percent increase in future competitors' anticipated local employment leads to 0.5 percent greater TFP improvement by domestic firms. We also find domestic firms respond most strongly to threats with larger expected employment, followed by threats with larger expected output. The value of investments does not have a direct impact.

[Table 3 inserted here]

Similarly, the size of threats, measured the size of expected employment and output, also affects the degree of labor productivity improvement, the extent of which exceeds even the effect on TFP improvement. A 100-percent increase in future competitors' anticipated local employment leads to 1.2 percent greater improvement in labor productivity by domestic firms.

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

4.2 Innovation, Skill Upgrading, and Product Mix Adjustment

In this sub-section, we explore the underlying mechanisms of productivity upgrading and investigate how domestic firms respond to the threat of foreign competition by adjusting innovation, labor skills, product mix and etc. We first utilize the rich information reported by Chinese National Bureau of Statistics' Survey of Industrial Firms to assess a variety of response variables

including R&D decision, staff training expense (as a share of revenue), introduction and revenue share of new products, and advertising expense (as a share of revenue).

The results are reported in Table 4. We find domestic firms raise R&D expenditure significantly after the arrival of news. In contrast, the actual entry of multinational firms does not affect domestic firms' R&D decision. A similar result is obtained for staff training expense. Domestic firms significantly increase staff training expense after the announcement of FDI news, suggesting increased efforts to upgrade labor skills. In addition to these responses, Chinese domestic firms are found more likely to introduce new products and pursue product diversification after the arrival of news. Another interesting observation is the increase in advertising expenses. Chinese domestic firms are found to raise advertising efforts in response to the threat of foreign competition.

[Table 4 inserted here]

The adjustment in product mix is also seen in other countries based on the Orbis data. In Table 5, we examine in greater detail how FDI news might motivate domestic firms to add and drop products and switch primary products. We find that the announcement of an FDI news in a domestic firm's primary industry increases the likelihood of this firm adding secondary products as well as switching its primary product. The actual entry of multinational firms is also found to exert a similar effect. Domestic firms are more likely to diversify their product mix and change their primary product after the actual occurrence of new FDI.

[Table 5 inserted here]

Next, we employ a cross-country patent application and citation dataset provided by Orbis which reports information such as patent application date, location, inventor name, outcome, and citations. This information enables us to explore another interesting dimension of firm response as changes in domestic firms' patent applications could reflect either changes in innovation activities or strategic patenting decisions. As shown in Table 6, we find FDI news to exert a positive significant effect on domestic firms' patent applications. The increase in patent applications following an FDI news exceeds the effect of actual entry. This result has two possible interpretations. It suggests that domestic firms have either increased innovation activities or greater patenting incentives (to protect their technology and knowhow) when anticipating new competition by foreign multinationals.

[Table 6 inserted here]

4.3 The Influence of News

Now we incorporate the characteristics of news and news publications into the analysis and investigate 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 piece of 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 compute, for each city, industry, and year, the average word count of news and the average circulation volume of publication titles reporting multinational entry news.

Specifically, we consider the following estimation equation:

$$\begin{aligned} y_{i,k,t} &= \alpha + \beta_1 News_{city,k,t-1} + \beta_2 News_{city,k,t-1} \times Influence_{city,k,t-1} \\ &\quad + \beta_3 Actual\ entry_{city,k,t-1} + \gamma Z_{i,k,t-1} + \lambda_{city,t} + \mu Growth_{city,k,t-1} + \mu_{country,k,t} + \varepsilon_{i,k,t} \end{aligned} \tag{3}$$

where $Influence_{city,k,t-1}$ represents the two measures of news influence discussed above. The results are reported in Table 7. We find domestic firms exhibit stronger TFP response to more influential news, specifically news from publications with a larger readership.

[Table 7 inserted here]

4.4 The Effect of Information

Given that the goal of this paper is to examine 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 us better establish the role of news/information as the specific substance reported — such as whether the news mentions investment motive and target market — and 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 factors such as local industrial shocks.

We find 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. As shown in Table 8, domestic firms are shown to respond only to FDI news where the investments are described to occur unambiguously and little to FDI news where the descriptions reveal uncertainties or contingencies about the foreign investments.

[Table 8 inserted here]

Second, we examine whether the news report motives of foreign investments (e.g., whether the new subsidiary of foreign MNCs seeks to serve primarily local or export markets). News

that provide such information are separated from the rest of the news and then divided into two groups: news of local-market seeking FDI and news of export-platform FDI. We find in Table 9 that the effect of FDI news varies sharply depending on whether the news describe the investment's target market and whether the target market is local or foreign. News of local-market seeking FDI lead to significant domestic TFP upgrading whereas news of export-platform FDI and news that do not provide target market information do not exert any effect on domestic firms' TFP.

[Table 9 inserted here]

5 Sensitivity Analysis

In the above analysis, we account for all time-variant city and country factors with the control of city-year and country-industry-year fixed effects and each city's industry-specific sales growth as a proxy of potential demand and technology shocks. However, two plausible concerns could still arise in the identification of the effect of FDI news. First, it is possible that the estimated effect of FDI news reflects a city's productivity and overall economic growth trends (e.g., productivity boom in Bangalore's IT industry in the recent decade). Put differently, FDI going to cities that have been experiencing economic booms in certain industries could attract greater media attention and have a greater probability of being reported. Second, the reporting of FDI news might be correlated with a city's unobservable contemporaneous shocks (that are not already controlled for by the city-year dummies and city-industry sales growth), such as the city's new industry policy which might influence the news preferences of local news agencies. We take two approaches below to address these issues.

5.1 Falsification Tests

First, we consider a placebo test by exploiting the specific timing of FDI news and assuming each FDI news had been published a year earlier. If FDI news indeed capture a local productivity and economic trend, the slight forward adjustment in the timing of news should lead to relatively small changes in the estimates. If, instead, the concern does not apply, FDI news, when assumed to occur before the actual news, should see no responses from domestic firms. As shown in Table 10, we find no TFP responses in the falsification setting.

[Table 10 inserted here]

We also perform an additional falsification test to further examine the validity of the issue by investigating the effect of FDI news on other performance outcomes such as profit growth. If indeed FDI news reflect local industry-specific economic growth trends (for instance, FDI news are reported because of domestic demand boom), we should expect as well an immediate positive

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 above. These results offer us further assurance that the estimated effect of FDI news is unlikely to have captured local economic growth trends.

5.2 IV Analysis

Next we address the possibility that the reporting of FDI news is correlated with a city's unobservable contemporaneous productivity shocks in a given industry, such as, say, Shanghai's new auto-industry policy which might motivate Shanghai's local newspapers to report more local auto-related news. To address this issue, we consider an Instrumental Variable (IV) approach where we instrument local FDI news with FDI news reported by foreign local news sources.

As shown in column (1) of Table 11's lower panel, we find no significant correlations between domestic firms' TFP growth and FDI news published by foreign local news sources (e.g., the productivity growth of auto firms in Shanghai is positively correlated with Shanghai's foreign investment news published by Chinese and major international news sources such as Shanghai Daily and Financial Times, but not with those published by foreign local news sources such as the Detroit News). This motivates us to assume that the FDI reporting by local news publications (publications catering primarily local readers) (i) is more likely to be driven by local news supply (e.g., inward or outward FDI activities by local companies); (ii) has little direct influence on the behavior of foreign readers (as shown in column (1) of Table 11's lower panel); and further, FDI news reported by local news sources from different countries might be correlated because of information flow (as shown in the upper panel of Table 11). Hence, based on these considerations, FDI news reported by local news sources in another country could serve as a plausible IV for FDI news reported by the host country's local news sources. The results are reported in Table 11. Our analysis shows that the instrumented local FDI news continue to exert a significant effect on domestic firms' responses.

[Table 11 inserted here]

6 Additional Evidence and Discussion

6.1 Heterogeneous Firm Response

Next we examine potential heterogeneity in domestic firms' responses and how they might vary across the distribution of firms. We interact the news variables with domestic firms' lagged TFP as well as its square term. The estimates reported in Table 12 suggest a non-monotonic pattern:

domestic firms at the right and left tails of the TFP distribution tend to respond to the news by upgrading TFP while domestic firms with intermediate TFP levels show little reactions.

[Table 12 inserted here]

Incorporating a unique dataset from Orbis that reports top direct competitors of MNCs with Chinese Annual Census of Enterprises, 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 (e.g., GM's existing subsidiary in China) and how the responses of the top competitors might differ from those of average domestic competitors in host countries (e.g., small and medium sized Chinese auto makers). Our analysis (Table 13) shows that top competitors, most of which are multinationals themselves, do not adjust their TFP (or innovation) decisions in response to FDI news. 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 unlikely to influence GM's TFP and innovation decisions in China. However, we find top competitors do respond to the news by increasing local advertising expenses, suggesting that threats of new FDI competition motivate top affected firms to raise marketing efforts in the local market.

[Table 13 inserted here]

6.2 Firm Responses in Upstream and Downstream Industries

While the focus of this paper is to examine the role of foreign competition threats on domestic firm responses in the same industry, we extend the analysis in this sub-section to investigate potential responses by domestic input suppliers and downstream customers: for example, how will intermediate input producers adjust their innovation decisions given news of FDI in downstream industries? As described in the introduction, there is important evidence (see Javorcik, 2004) on knowledge spillover from foreign multinationals to domestic firms through the sharing of vertical production linkages. Would then industries with vertical production linkages respond to not only each other's actual FDI but also anticipated investments?

Similar to Javorcik (2004), we exploit input-output relationships between each pair of industries to construct the weighted sum of FDI news in upstream and downstream industries, i.e., $\sum_{k'} IO_{k'k} News_{city,k',t-1}$ and $\sum_{k'} IO_{kk'} News_{city,k',t-1}$ where $IO_{k'k}$ is input-output linkage between industry k and k's measured by the share of industry k's inputs that come from industry k'. The input-output linkages are computed using the 2002 Benchmark Input-Output Accounts published by the Bureau of Economic Analysis.

The results are reported in Table 14. We find 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. These results are

highly consistent; the anticipation of new foreign multinational customers motivate domestic intermediate input producers to increase innovation, which in turn leads to a subsequent TFP increase after the actual entry of foreign multinational customers.

[Table 14 inserted here]

7 Conclusion

In this paper, we disentangle domestic firm response to foreign competition threats from the effect of actual foreign competition using a unique constructed dataset of foreign investment news and exploring time lags between the arrivals of foreign investment news and actual investments. We investigate firm responses in both productivity and underlying mechanisms including innovation, skill upgrading, and product mix. Our results indicate that domestic firms respond significantly to the threat of foreign multinational competition by increasing productivity, R&D, labor training, patent applications, product diversification, and advertising expense. The actual arrival of foreign investment, in contrast, is found to have weaker or no effect. The degree of response increases with the size of threats (measured by the expected output and employment), the influence of news (measured by the circulation volume), and the amount of information on the certainty and the target market of future investments.

Our analysis shows that response to FDI news exhibits substantial heterogeneity across firms. 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. Top global competitors identified directly by investing multinationals, most of which are multinationals themselves, do not adjust their TFP (or innovation) decisions, but instead increase local advertising effort in reaction to FDI news. The influence of FDI news also extends across industries and cities. For example, domestic firms are shown to increase innovation after FDI news in downstream industries.

We employ two separate approaches to address potential correlations between FDI news reporting and persistent as well as contemporaneous local industry shocks. First, we consider a placebo test by exploiting the specific timing of FDI news and assuming each FDI news had been published a year earlier and find no domestic firm response to the placebo news. Second, we adopt an Instrumental Variable (IV) approach where we instrument local FDI news with FDI news reported by foreign local news sources. This is motivated by the insignificant correlations between domestic firms' TFP growth and FDI news published by foreign local news sources and the belief that FDI reporting by local news publications (publications catering primarily local readers) is more likely to be driven by local news supply. Our analysis shows that the estimated effect of FDI news remains robust.

Our analysis contributes to the literature by offering new evidence on the effect of foreign competition threats and distinguishing between the preemptive actions of domestic firms and the

effects (including both externalities and competition effects) of actual foreign competition. Our findings show that the latter is not the only link that connects foreign competition with domestic firm performance: domestic responses could initiate before the actual arrival of competition. This strategic, self response to competition threats represents an under-emphasized, but crucially important mechanism through which globalization affects domestic economies, accounting for, in our analysis, essentially all the domestic productivity growth associated with multinational competition.

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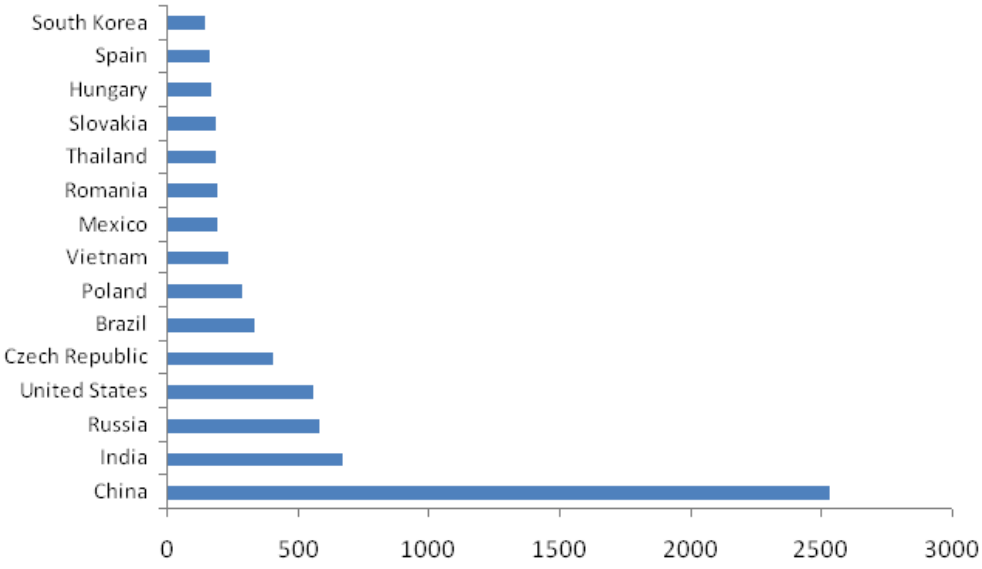

Figure 1: Top host countries by investment news count

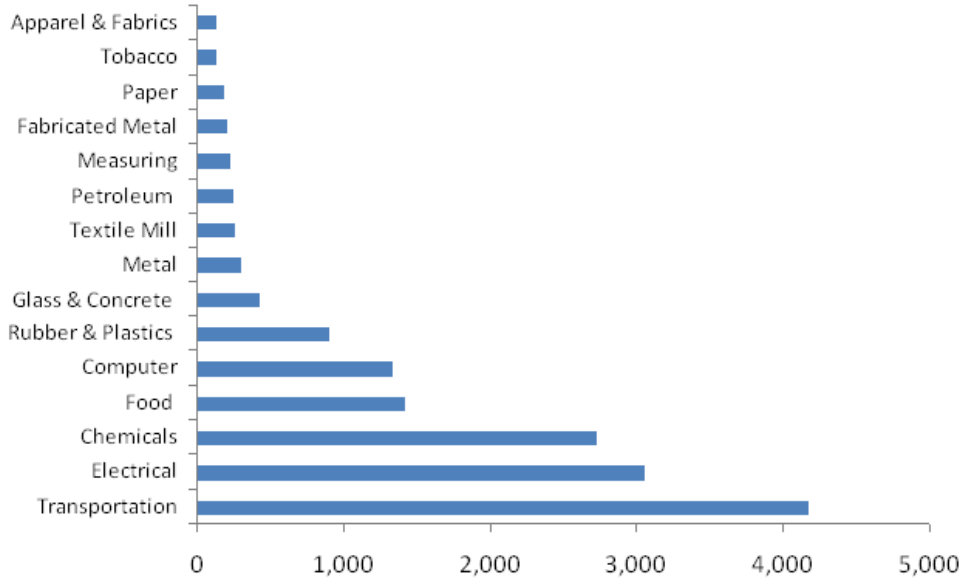

Figure 2: Top industries by investment news count

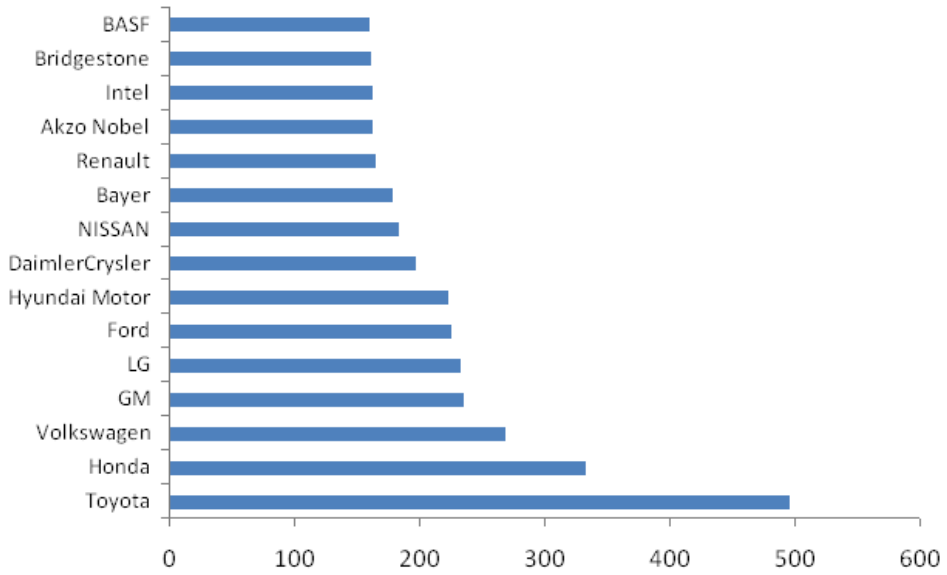

Figure 3: Top firms by investment news count

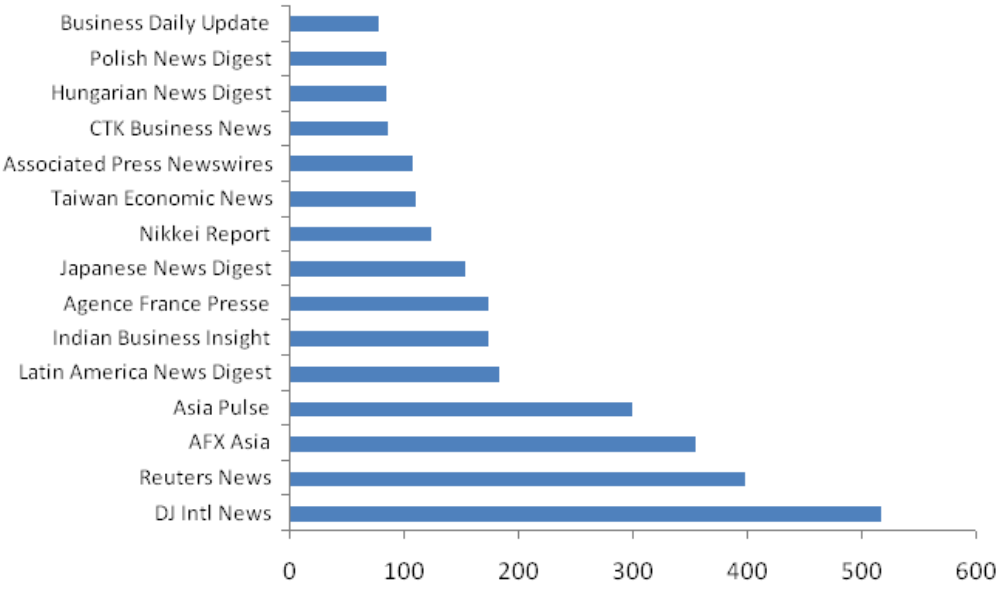

Figure 4: Top publications by investment news count

Table 1: The Threat of Multinational Entry v.s. Actual Entry: TFP

Dependent variable: Change in TFP	(1)	(2)	(3)
News dummy	0.010***		
	(0.003)		
Actual entry dummy	0.001		
	(0.003)		
News count		0.002**	
		(0.001)	
MNC count			0.006***
			(0.002)
Actual entry count		-0.000	-0.000
		(0.000)	(0.000)
Domestic ave. sales growth	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)
Size	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)
Capital intensity	0.021***	0.021***	0.021***
	(0.000)	(0.000)	(0.000)
Age	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	1,470,663	1,470,663	1,470,663
R square	0.018	0.018	0.018

Notes: This table examines domestic firms' TFP responses to the threat of multinational entry and the occurrence of actual entry. The dependent variable is a domestic firm's change in log TFP. The variables "news dummy" and "news count" are, respectively, an indicator and a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variables "actual entry dummy" and "actual entry count" are, respectively, an indicator and a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 2: The Threat of Multinational Entry v.s. Actual Entry: Labor Productivity

Dependent variable: Change in Labor productivity	(1)	(2)	(3)
News dummy	0.007*		
	(0.004)		
Actual entry dummy	0.005**		
	(0.002)		
News count		0.001	
		(0.001)	
MNC count			0.002
			(0.002)
Actual entry count		0.000	0.000
		(0.000)	(0.000)
Domestic ave. sales growth	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)
Size	0.034***	0.034***	0.034***
	(0.000)	(0.000)	(0.000)
Capital intensity	-0.029***	-0.029***	-0.029***
	(0.001)	(0.001)	(0.001)
Age	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	2,066,866	2,066,866	2,066,866
R square	0.026	0.026	0.026

Notes: This table examines domestic firms' labor productivity responses to the threat of multinational entry and the occurrence of actual entry. The dependent variable is a domestic firm's change in log labor productivity. The variables "news dummy" and "news count" are, respectively, an indicator and a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variables "actual entry dummy" and "actual entry count" are, respectively, an indicator and a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 3: The Size of Threat: TFP

Dependent variable: Change in TFP	(1)	(2)	(3)
News dummy	-0.018*	-0.020*	0.011
	(0.010)	(0.011)	(0.025)
x Expected output	0.002***		
	(0.001)		
x Expected local employment		0.005***	
		(0.002)	
x Investment value			0.001
			(0.001)
Actual entry dummy	0.000	0.001	0.001
	(0.003)	(0.003)	(0.003)
Domestic ave. sales growth	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)
Size	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)
Capital intensity	0.021***	0.021***	0.021***
	(0.000)	(0.000)	(0.000)
Age	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	1,456,467	1,454,234	1,468,064
R square	0.018	0.018	0.018

Notes: This table examines domestic firms' TFP response to different sizes of threats of multinational entry. The dependent variable is a domestic firm's change in log TFP. The variable "news dummy" is an indicator of news on multinational entry in a given city, SIC 3-digit industry, and year. The "news dummy" is interacted, respectively, with the average output, employment, and investment value of announced multinational entry. The variable "actual entry dummy" is an indicator of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 4: Innovation, Skill Upgrading, and Organization Decisions (Chinese Data)

Dependent variable:	(1) RD	(2) Staff training	(3) New product	(4) New product rev	(5) Advertising
News dummy	0.016***	0.001*	0.008*	0.002**	0.0002*
	(0.005)	(0.000)	(0.005)	(0.001)	(0.0001)
Actual entry dummy	-0.001	-0.000	-0.006	-0.000	-0.0001
	(0.004)	(0.000)	(0.004)	(0.002)	(0.0001)
Domestic ave. sales growth	0.001**	-0.000	0.001**	-0.000	0.000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Size	0.069***	0.000	0.049***	0.001***	0.001***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
Capital intensity	0.038***	-0.000	0.027***	0.000*	0.000*
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
Age	0.001***	0.000	0.001***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes	Yes	Yes
Obs	673,244	405,467	700,528	620,690	405,676
R square	0.115	0.001	0.074	0.001	0.001

Notes: This table examines the effect of FDI news on domestic firms' innovation, skill upgrading, and organization decisions. The dependent variables are whether a domestic firm engages in research and development, staff training expenses (as a share of revenue), whether to introduce new products and their revenue share, and advertising expenses (as a share of revenue). The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 5: FDI News and Product Mix

Dependent variable:	(1)	(2)	(3)
	Add product	Drop product	Switch primary product
News dummy	0.044***	0.003	0.054***
	(0.007)	(0.004)	(0.009)
Actual entry dummy	0.066***	-0.002**	0.068***
	(0.003)	(0.001)	(0.004)
Domestic ave. sales growth	0.005***	0.002***	0.008***
	(0.000)	(0.000)	(0.000)
Size	0.003***	0.008***	0.000***
	(0.000)	(0.000)	(0.000)
Age	-0.000***	0.000***	-0.000***
	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	4,000,169	4,000,169	4,000,169
R square	0.319	0.042	0.248

Notes: This table examines domestic firms' product mix adjustments in response to FDI news. The dependent variables are whether a domestic firm adds and drops products and switches its primary product. The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 6: FDI News and Patenting Decisions

Dependent variable: Change in patent applications	(1)	(2)
News count	0.001**	
	(0.000)	
MNC count		0.002*
		(0.001)
Actual entry count	0.000**	0.000**
	(0.000)	(0.000)
Import growth	-0.001**	-0.001**
	(0.000)	(0.000)
Country-industry FE	Yes	Yes
Country-year FE	Yes	Yes
Industry-year FE	Yes	Yes
Country-industry-year cluster	Yes	Yes
Obs	118,451	118,451
R square	0.99	0.99

Notes: This table examines domestic firms' patenting decisions in response to FDI news. The dependent variables are a domestic firm's change in log patent applications. The variable "news count" is a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry count" is a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry, country-year, and industry-year fixed effects. Standard errors are clustered at the country-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 7: The Influence of News

Dependent variable: Change in TFP	(1)	(2)
News dummy	0.015	-0.024**
	(0.024)	(0.012)
x Ave. word count	-0.001	
	(0.005)	
x Ave. circulation		0.003***
		(0.001)
Actual entry dummy	0.001	0.001
	(0.003)	(0.003)
Domestic ave. sales growth	-0.003***	-0.003***
	(0.000)	(0.000)
Size	0.001*	0.001*
	(0.000)	(0.000)
Capital intensity	0.021***	0.021***
	(0.000)	(0.000)
Age	-0.001***	-0.001***
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	1,470,663	1,470,663
R square	0.018	0.018

Notes: This table examines domestic firms' TFP response to news with different degrees of influence. The dependent variables are a domestic firm's change in log TFP. The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The news dummy is interacted with the average word count of news and the average circulation volume of publications, respectively. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 8: The Effect of Information: Uncertainty

Dependent variable:	(1)	(2)	(3)	(4)
	Change in TFP		RD decision	
News (with certainty) dummy	0.010***		0.014***	
	(0.003)		(0.005)	
News (with uncertainty) dummy	0.000		0.001	
	(0.007)		(0.012)	
Actual entry dummy	0.001		-0.001	
	(0.003)		(0.004)	
News (with certainty) count		0.002**		0.003***
		(0.001)		(0.001)
News (with uncertainty) count		-0.001		0.004
		(0.003)		(0.007)
Actual entry count		-0.000		-0.001*
		(0.000)		(0.000)
Domestic ave. sales growth	-0.003***	-0.003***	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.001*	0.001*	0.069***	0.069***
	(0.000)	(0.000)	(0.001)	(0.001)
Capital intensity	0.021***	0.021***	0.038***	0.038***
	(0.000)	(0.000)	(0.001)	(0.001)
Age	-0.001***	-0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes	Yes
Obs	1,457,828	1,457,828	673,244	673,244
R square	0.018	0.018	0.115	0.115

Notes: This table examines domestic firms' TFP response to the content of news, in particular, the uncertainty of FDI announced in the news. The dependent variables are a domestic firm's change in log TFP. The variables "news dummy" and "news count" are, respectively, an indicator and a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variables "actual entry dummy" and "actual entry count" are, respectively, an indicator and a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 9: The Effect of Information: Target Market

Dependent variable:	(1)	(3)
	Change in TFP	RD decision
News dummy	0.009***	0.019***
	(0.003)	(0.005)
x Local market motive dummy	0.019**	-0.005
	(0.010)	(0.010)
x Export motive dummy	-0.012	-0.021**
	(0.013)	(0.009)
Actual entry dummy	0.001	-0.000
	(0.003)	(0.004)
Domestic ave. sales growth	-0.003***	-0.003***
	(0.000)	(0.000)
Size	0.001*	0.001*
	(0.000)	(0.000)
Capital intensity	0.021***	0.021***
	(0.000)	(0.000)
Age	-0.001***	-0.001***
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	1,470,663	673,244
R square	0.018	0.115

Notes: This table examines domestic firms' TFP response to the content of news, in particular, the FDI's target market reported in the news. The dependent variables are a domestic firm's change in log TFP and research and development decision. The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 10: Placebo Test: Timing of FDI News

Dependent variable: Change in TFP	(1)	(2)	(3)
Placebo news dummy	0.003		
	(0.004)		
Actual entry dummy	0.002		
	(0.003)		
Placebo News count		0.004	
		(0.005)	
Placebo MNC count			0.001
			(0.004)
Actual entry count		-0.000	-0.000
		(0.000)	(0.000)
Domestic ave. sales growth	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)
Size	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)
Capital intensity	0.021***	0.021***	0.021***
	(0.000)	(0.000)	(0.000)
Age	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes	Yes
City-year FE	Yes	Yes	Yes
City-industry-year cluster	Yes	Yes	Yes
Obs	1,470,663	1,470,663	1,470,663
R square	0.018	0.018	0.018

Notes: This tablet reports a falsification test where FDI news were assumed to occur a year earlier than the actual date. The dependent variables are a domestic firm's change in log TFP. The variables "news dummy" and "news count" are, respectively, an indicator and a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variables "actual entry dummy" and "actual entry count" are, respectively, an indicator and a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 11: IV Analysis

First Stage		
Dependent variable:		Domestic local news count
Foreign local news count		0.194***
		(0.021)
Country-industry-year FE		Yes
City-year FE		Yes
Obs		6,465
R square		0.118
Second Stage		
Dependent variable:	(1)	(2)
Change in TFP	OLS	IV
Local news count	0.004**	
	(0.002)	
Foreign local news count	0.003	
	(0.002)	
Instrumented local news count		0.007**
		(0.003)
Actual entry count	-0.000	-0.000
	(0.000)	(0.000)
Domestic ave. sales growth	-0.003***	-0.003***
	(0.000)	(0.000)
Size	0.001*	0.001***
	(0.000)	(0.000)
Capital intensity	0.021***	0.021***
	(0.000)	(0.000)
Age	-0.001***	-0.001***
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	1,470,181	1,470,181
R square	0.018	0.018

Notes: This table reports the IV analysis where FDI news reported by domestic local sources are instrumented by those reported by foreign local sources. The dependent variables are a domestic firm's change in log TFP. The variable "news count" is a count of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry count" is a count of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 12: Heterogeneous Responses to FDI News

Dependent variable: Change in TFP	(1)	(2)
News dummy	0.182***	0.303***
	(0.035)	(0.082)
News dummy*Lagged TFP	-0.060***	-0.172***
	(0.012)	(0.063)
News dummy*Lagged TFP square		0.023*
		(0.012)
Lagged TFP	-0.196***	-0.196***
	(0.002)	(0.002)
Actual entry dummy	0.006**	0.007**
	(0.003)	(0.003)
Domestic ave. sales growth	0.001*	0.001*
	(0.000)	(0.000)
Size	0.004***	0.004***
	(0.000)	(0.000)
Capital intensity	-0.033***	-0.033***
	(0.001)	(0.001)
Age	-0.001***	-0.001***
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	1,457,828	1,457,828
R square	0.103	0.103

Notes: This table reports domestic firms' heterogeneous TFP response to FDI news. The dependent variables are a domestic firm's change in log TFP. The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 13: Responses of Top Direct Competitors (Chinese Data)

Dependent variable:	(1) Change in TFP	(2) Advertising
News dummy	-0.019	0.004**
	(0.033)	(0.002)
Ever been threatened dummy	-0.026	0.001
	(0.017)	(0.003)
Domestic ave. sales growth	-0.007	-0.000
	(0.012)	(0.000)
Size	-0.005	0.000
	(0.005)	(0.000)
Capital intensity	-0.002	0.000
	(0.007)	(0.000)
Age	-0.000	-0.000
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	2,135	2,156
R square	0.094	0.070

Notes: This table reports responses to FDI news by top global competitors. The variable "news dummy" is a dummy of news on multinational entry in a given city, SIC 3-digit industry, and year. The variable "actual entry dummy" is a dummy of actual multinational entry in a given city, SIC 3-digit industry, and year. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

Table 14: Domestic Firm Responses to FDI News in Downstream and Upstream Industries

Dependent variable:	(1) Change in TFP	(2) RD decision
Weighted news count (within industry)	0.002**	0.003**
	(0.002)	(0.001)
Weighted news count (downstream industries)	-0.003	0.015**
	(0.007)	(0.008)
Weighted news count (upstream industries)	-0.003	-0.022
	(0.016)	(0.012)
Weighted actual entry count (within industry)	-0.000	-0.001*
	(0.000)	(0.000)
Weighted actual entry count (downstream industries)	0.010*	0.001
	(0.007)	(0.005)
Weighted actual entry count (upstream industries)	-0.001	0.001
	(0.001)	(0.007)
Domestic ave. sales growth	-0.003***	0.001**
	(0.000)	(0.000)
Size	0.001*	0.069***
	(0.000)	(0.001)
Capital intensity	0.021***	0.038***
	(0.000)	(0.001)
Age	-0.001***	0.001***
	(0.000)	(0.000)
Country-industry-year FE	Yes	Yes
City-year FE	Yes	Yes
City-industry-year cluster	Yes	Yes
Obs	1,470,663	673,244
R square	0.018	0.115

Notes: This table reports domestic firms' TFP and innovation responses to FDI news in downstream and upstream industries. The dependent variables are a domestic firm's change in log TFP and research and development decisions. The three "news count" variables are counts of news on multinational entry in the same industry, downstream industries, and upstream industries. The three "actual entry count" variables are counts of actual multinational entry in the same industry, downstream industries, and upstream industries. All variables on the right hand side are lagged by one year. All regressions include country-industry-year and city-year fixed effects. Standard errors are clustered at the city-industry-year level and reported in the parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.