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India's FDI Restrictions on Bordering Economies: Implications on China's Greenfield FDI to Emerging Market Economies

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1 Introduction

Foreign direct investment (FDI) is an integral source of long-term investments that improve employment creation, technological transfer, and human capital formation in emerging market economies (EME) (Blomstrom, 1991; Loungani & Razin, 2001; OECD, 2002). As such, policymakers in EMEs largely opt to create a conducive regulatory environment in a bid to attract FDI. However, unprecedented economic shocks can revoke such liberalization mandates on FDI policies (Bian, 2021). During periods of economic downturn, low valuations induce opportunistic takeovers in EMEs. In such instances, FDI policies of destination markets become restrictive to protect national interests. International spillovers from such policy upheavals could also arise as FDI flows could be diverted to EMEs without similar restrictions.

The 2020 restrictions imposed by the Government of India on FDI from the border-sharing economies can be construed as an example of the aforementioned FDI policy upheaval. Following the Covid-19 pandemic induced economic shock, India mandated a government clearance requirement for new FDI projects from land-border sharing economies. India largely put forth the new FDI rules intending to evade opportunistic takeover by Chinese firms (Kalra & Ahmed, 2020). We use the 2020 India FDI restrictions as a natural experiment to examine two questions: a) EME destination effect: did India's FDI policy restrictions cause the bilateral FDI flows from China to India to decline relative to the investment flows from the rest of the world to India, b) EME reallocation effect: was there international spillovers from 2020 India FDI restrictions? In particular, we evaluate whether China reallocated its outward FDI to other EMEs post the India FDI curbs. In this regard, we make a novel attempt using a natural experiment to evaluate whether domestic FDI policy restrictiveness in EMEs can indirectly benefit other similar EMEs with diverted investments.

The paper leverages the bilateral crossborder greenfield project investment data from Orbis BVD during the period January 2019 to April 2021. The dataset enables us to use a more granular indicator of FDI, namely bilateral greenfield FDI project values at six-digit NAICS industry level, to assess the implications of the 2020 India FDI policy restriction. We utilise difference in difference methodology with a full battery of interacted fixed effects and time trends, to minimise confounders that are commonly found to determine bilateral FDI flows. Furthermore, we account for the Covid-19 pandemic shock in the empirical framework by incorporating Covid-19 cases and the Oxford Covid-19 stringency index as explanatory variables. We also adopt a variety of estimation techniques and conduct extensive robustness checks.

The results from the study indicate that China's greenfield project investments in

India declined after the 2020 India FDI restrictions, providing robust evidence of the EME destination effects of the FDI policy restrictions. The industries adversely affected were the ones which attracted the largest amount of investments from China before the restrictions rolled out; automobiles and smartphone manufacturing, and services. Furthermore, we also find evidence that China reallocated investments (reallocation effects), with ASEAN markets such as Myanmar, Malaysia, Thailand, Philippines and Vietnam receiving the bulk of the diverted investments. Finally, the reallocation in China's FDI to EMEs was driven exclusively through an expansion in investment size per project than an increase in the number of new investment projects.

The remainder of the paper is organised as follows. [Section 2](#) reviews the evolution of China and India's bilateral trade and investment relationship. [Section 3](#) gives an overview of the data used in this study. [Section 4](#) evaluates the destination effects of 2020 India FDI restrictions by examining bilateral greenfield investments in India from China relative to the rest of the world. [Section 5](#) explores the international spillovers of the 2020 India FDI restrictions. [Section 6](#) concludes.

2 A primer on India-China trade and investment relations

This section provides a background on the evolution of the economic ties between India and China from the early 1990's up until the 2020 India FDI restrictions.

2.1 Historical context: 1990s to early-2010s

Shortly after the onset of the Covid-19 pandemic, the Government of India took a major decision of stepping up scrutiny of FDI from border-sharing neighbouring economies. This was done to prevent any 'opportunistic takeovers' of Indian firms adversely affected by the pandemic.

Long before Covid-19, however, India and China forged strong bilateral trade ties. In the wake of the 1991 Indian balance-of-payment crisis, India initiated broad-ranging economic reforms aimed at improving industrial efficiency, addressing fiscal and current-account balances, and transforming India's fixed exchange-rate regime to a floating one. Private participation was encouraged in sectors such as telecommunications and banking that were previously too sacrosanct. Foreign investments poured in as India embraced competition and established the Foreign Investment Promotion Board to expedite government approvals.

India-China trade took off in the mid-1990s and has been generally on an upward

trajectory ever since. The bilateral trade grew exponentially between 2000 and 2014 (see Fig. 1). There was an average 23% increase in bilateral trade each year, and soon enough China became India’s largest trading partner. While the growth in bilateral trade improved India-China’s political and diplomatic relations, it did not come without qualifications. Over the years, the presence and prominence of Chinese goods in India grew; the exports from India, however, displayed lacklustre performance. This ballooning unbalanced trade has made India run its largest trade deficit with China.

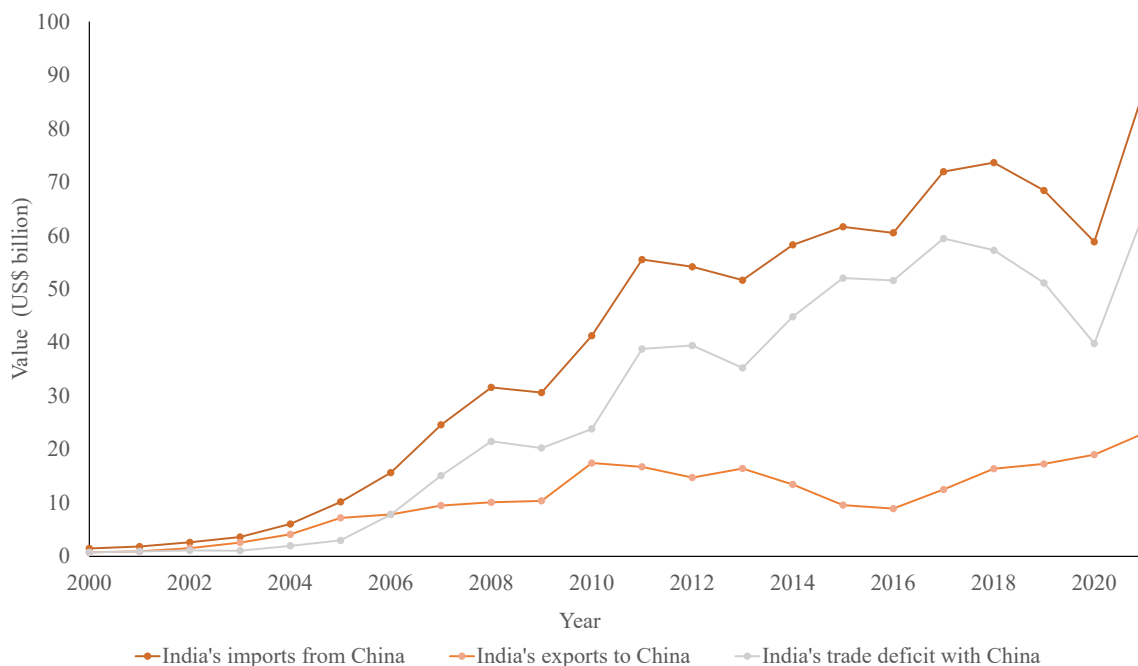


Figure 1: India-China Bilateral Trade

Source: Author’s calculations based on UN Comtrade Database

In contrast to a booming bilateral trade, between 2000 and 2013, China’s share in India’s FDI inflows were abysmally small at around 0.4% (Venu, 2015). India received an accumulated US\$ 400 million from China between 2000 and 2014. However, China invested a whopping US\$ 100 billion in 2013 alone and became the world’s third largest source of FDI that year (Casanova et al., 2015). India did not even make it to the top 10 recipients of China’s FDI in Asia that year. While trade was quick to pick up, bilateral investments between China and India trailed far behind.

2.2 India-China occupy the centre stage of bilateral investments

Beginning in 2014, India and China were set on a fresh momentum of deeper cooperation and heightened bilateral engagements. India launched landmark initiatives and introduced reforms to open the Indian economy to foreign investments. This coincided with

China's lookout for new business partners as it struggled with its increasing labour costs for manufacturing and an economic slowdown since 2008. Together, these two events helped the two neighbours occupy the centre stage of global bilateral investments.

The trends in China's investments saw a marked shift after 2014 when Narendra Modi became Prime Minister of India. His government passionately promoted *Make in India*, *Digital India* and *Start-up India* initiatives. *Make in India* was "devised to transform India into a global design and manufacturing hub" ([Make in India, 2014](#)). The idea was to strengthen India's manufacturing sector, eliminate superfluous laws and regulations, streamline bureaucratic processes and attract foreign investment. These initiatives strove to digitize different aspects of life such as finance, education, commerce and even governance. *Make in India* and *Digital India* programs were synergized to invite new businesses (courtesy *Startup India*) and allow the existing ones to innovate and help India become a digital economy¹. The reforms opened up sectors such as defence, manufacturing, space, and railways to FDI and attracted investments across other 25 sectors including electronics manufacturing, chemicals, construction, food processing, pharmaceuticals, single brand retailing, and energy ([Department for Promotion of Industry and Internal Trade, 2015](#)).

One of the game-changing reforms was to raise the threshold limit for one-time Foreign Investment Promotion Board approval from INR 20,000 million to INR 50,000 million in 2015 ([Department for Promotion of Industry and Internal Trade, 2016](#)). Many global electronic brands rushed to invest in India and engage in e-commerce. The Modi Government also expedited approvals for foreign investments by progressively placing different sectors on the 'automatic route' – one of the two ways through which foreign investors may invest in India. The 'automatic route' permitted foreign investment without government approval in almost all sectors within the prescribed thresholds. Under the 'government route', "prior approval of the Indian government, Ministry of Finance, Foreign Investment Promotion Board (FIPB) is required" ([Reserve bank of India, 2007](#)). Investments from China were channelled through the automatic route, while those from Pakistan and Bangladesh required government clearance.

With global investors long eyeing the FDI deregulations, India attracted US\$ 63 billion worth FDI projects and overtook China as the top destination for FDI in 2015 ([The Economic Times, 2016](#)). To further catapult the economy on a strong growth trajectory, the Modi government announced a string of FDI liberalising reforms in less than seven months in June 2016. India climbed 14 rankings to 63rd in 2019 from 77th the year before on erstwhile Ease of Doing Business index ([Laxman, 2019](#)).

¹*Startup India* intended to promote startups, cultivate a conducive environment to do business in and thereby improving the ease of doing business in the country.

India’s vehement reformation of its economy sent ripples across its borders. China MNCs grew more confident in the Indian economy and its manufacturing competitiveness as they began setting up factories in the country (Patil, 2017). India witnessed massive FDI inflows to the tune of USD 1.8 billion from China between April 2014 and March 2019 (The Economic Times, 2019). Fig. 2 illustrates the highest FDI-receiving sectors of India between April 2000 and December 2021. Majority of these sectors received over 50% of their total FDI inflows in the last seven years as compared to the prior 15 years.

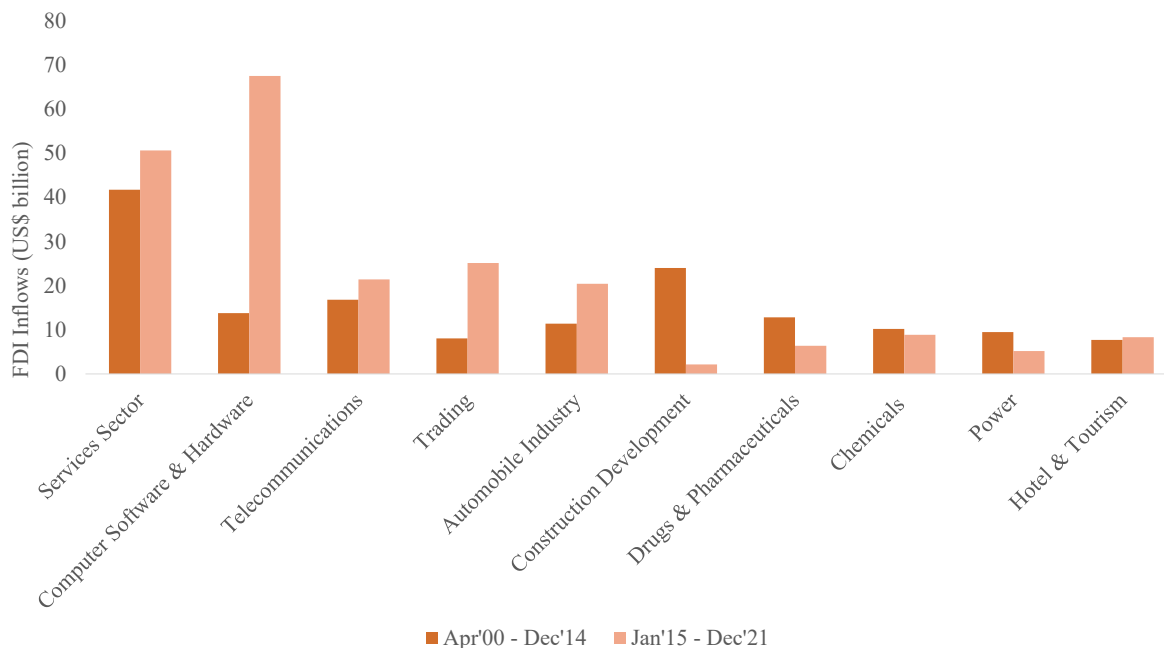


Figure 2: Indian sectors attracting the highest FDI inflows

Source: Author’s estimations based on FDI Factsheets by Department for Promotion of Industry and Internal Trade, India

China smartphone companies, arguably, have leveraged the *Make in India* initiative and FDI deregulation across e-commerce to assemble devices locally for the Indian domestic market. China MNCs such as BBK Group, Xiaomi and Huawei dominated the market with 65% market share in 2021 which was just 32% in 2015 (The Quint, 2022). Xiaomi pioneered sales in India with its vibrant hardware ecosystem of over 250 product categories including smart televisions, fitness bands, power banks, audio devices, security cameras and, laptops. BBK Group, which sells phones under different competing brands – Oppo, Vivo, Realme and OnePlus – also took the market by storm. The Group planned to invest US\$ 504 million for a new greenfield Electronics Manufacturing Cluster (Business Today, 2018)². In 2019, 560 million Indian citizens had access to the internet,

²EMC scheme launched in 2012 by the Ministry of Communications and Information Technology,

representing the second-highest number of mobile internet users in the world, after China (Ahaskar, 2019). India’s wave of digital presence rode on the affordable smartphones from Chinese players and, one of the world’s least expensive internet access. When Government opened e-commerce sector to 100% FDI, the investments in the technology sector peaked as startups in the e-commerce and fintech sectors attracted US\$7 billion in funding in total, both from home and overseas in 2017. Several Indian unicorn start-ups (those with a valuation of over USD 1 billion) sit atop Chinese investments – majority of which have been made by Chinese giants Alibaba and Tencent (Bhowmick, 2021).

2.3 India’s FDI restrictions

At a time where FDI inflows to India from China were at unprecedented levels, the Indian government suspended the ‘automatic route’ for investments from border-sharing economies in April 2020 (Sidhartha, 2007). Investments from these economies were put on ‘government route’ requiring a government approval. The revised policy impacted investors and firms from China the most owing to the bulk of Chinese investments across various sectors in India. Further, to prevent circumvention of restrictions, the rule also applies to investing entities with Chinese citizens holding ‘beneficial ownership’. As a result, the average project value of greenfield FDI projects drastically dipped after the 2020 FDI restrictions ³ (see Fig. 3).

Two events are said to be responsible for the imposition of the 2020 FDI restrictions. First and the more obvious one is the onset of Covid-19 pandemic. Second and the more important trigger was the Chinese Central Bank, People’s Bank of China’s increase in stake in India’s leading mortgage lender Housing Development Financial Corporation (HDFC) by one percent in March 2020 (Pant & Sharma, 2020). With the ‘automatic route’ suspended for neighboring economies, the India government could then preempt China’s acquisitions of Indian companies at throwaway prices.

India-China’s economic ties were already deteriorating owing to the new FDI restrictions, it worsened when the troops from both sides clashed along the Sino-Indian border in Galwan Valley in Ladakh beginning May 2020. There were casualties on both sides of the border – India acknowledges that 20 of its military personnel got killed in the stand-off while China remains in utter denial (BBC, 2020). India and China have accused each other of infiltrating into the other side by building infrastructure along the Line of Actual Control (LAC), which at best remains ill-defined (BBC, 2021). While there were partial disengagements in between the conflicts, tensions remain as both countries stand

aims to provide world-class infrastructure to attract domestic and foreign investments in the Electronics Systems Design and Manufacturing Sector.

³Refer to Fig. 4 for the complete timeline of events

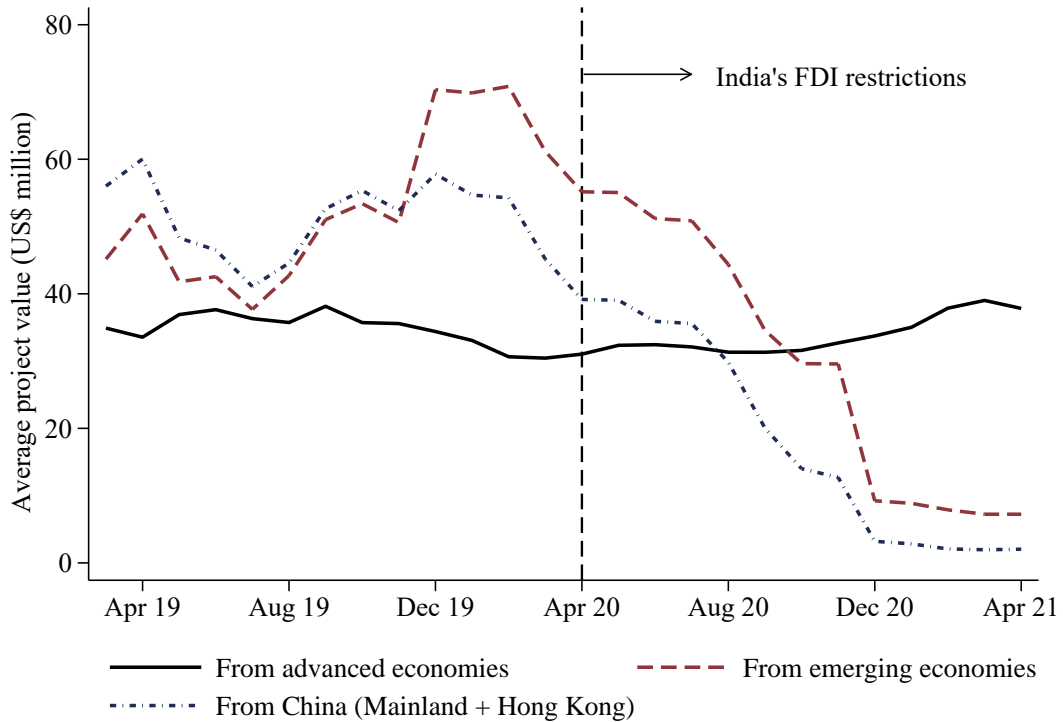


Figure 3: Greenfield FDI to India

Source: Author's calculations based on Orbis Crossborder Investment Database

by with mobilized defence infrastructure at the border. Amidst a nationalistic furore in the months following the border skirmish, India banned around 59 Chinese apps citing transfer of sensitive data on Indians to Chinese servers as a reason for the ban. Since then, a total of around 224 Chinese apps have been banned by India (Agarwal, 2022). This has resulted in a strained political and economic relationship between the two nations.

3 Data overview

The empirical investigation on the implications of the 2020 India FDI restrictions uses data on bilateral greenfield FDI projects and Covid-19 pandemic. In what follows, we discuss the data used in the study.

3.1 Bilateral greenfield FDI projects

We use Orbis cross-border investment database, which tracks daily information on greenfield FDI projects for the bilateral greenfield FDI inflows. The database reports the source and destination of the greenfield investment projects along with information on

the project status, dates corresponding to different statuses, project capital expenditure, and industrial classification. Industrial classification follows the 6 digit North American Industry Classification System (NAICS)

Orbis regularly updates the status of an FDI project and sometimes erroneously assigns unique identification to the same project with different statuses. This leads to two data issues – duplication and difficulty in identifying and retaining the most-updated project details. To address these issues, we first filter out the duplicates based on a number of variables that are most likely to be common to duplicated. Second, we assign ‘status dominance’ – a score from 1 to 4 – to the remaining observations based on their current status. ‘Rumored’ projects receive a score of 4, ‘Announced’ projects are scored at 3, ‘Completed Assumed’ projects at 2 and ‘Completed’ projects at 1. We then ensure that for a given project, based on the variables selected in the first step, ‘status dominance’ with the maximum score is retained. This is how we construct our bilateral greenfield FDI projects dataset.

Using the project-level data reported by Orbis, we compute the monthly average of bilateral greenfield FDI project investments for each NAICS 6 digit industry. This is the main dependent variable used in the empirical investigation of the 2020 India FDI restrictions. We also consider other bilateral FDI measures such as aggregate FDI (monthly sum of greenfield project investments for each bilateral pair at NAICS 6 digit industry level), the number of projects (monthly count of greenfield projects for each bilateral pair at NAICS 6 digit industry level) and project size (aggregate FDI divided by number of projects).

Our data period extends from January 2019 to April 2021 and our sample universe comprise bilateral greenfield project investments that flows from all markets (advanced and emerging) to emerging markets. The treatment and control groups in the first part of the empirical analysis pertains to bilateral greenfield FDI projects from China to India and rest of the world to India, respectively. In the second part of the empirical analysis on the reallocation effects, the definition of control and treatment group changes – treatment group consists of bilateral greenfield investments from China to emerging markets whereas the control group comprises investment flows from rest of the world to emerging markets⁴. It is important to note that the new FDI rule applies to the source markets of Mainland China, Macau and Hong Kong only and not Taiwan (Suneja & Sikarwar, 2020). Unless otherwise specified, ‘China’ refers to the former three markets and excludes Taiwan.

The benchmark period extends from January 2019 to August 2019. The pre and post-treatment periods pertains to September 2019 – March 2020 and April 2020 – April 2021,

⁴The empirical analysis of reallocation effects excludes India, China (mainland+Hong Kong) as destination markets.

respectively. To better capture the effect of the 2020 India FDI restrictions on investment flows, we ensure that there is a sound history of bilateral investment between any pair of source and destination markets. We do that by summing the bilateral investment records prior to April 2020. We consider only bilateral pairs with investment records greater than six in the data sample to circumvent sporadicity in investment activities.

3.2 Covid-19 data

We use two Covid-related measures in the empirical analysis – monthly new Covid cases and stringency measures as a response by the governments to Covid-19. For new Covid cases, we use Our World In Data COVID-19 dataset (Ritchie et al., 2020) which is in turn sourced from Johns Hopkins University, Center for Systems Science and Engineering Covid-19 Data). This daily frequency data is aggregated to yield monthly aggregated new cases (hereafter ‘new cases’) as a proportion of the given country’s population. The new cases are calculated for each source and destination markets in the data sample.

The stringency measure is sourced from Oxford COVID-19 Government Response Tracker (Hale et al., 2021). It tracks policy measures taken by the governments across the world to tackle Covid-19. We average the daily stringency data to compute the monthly stringency score for each market in our sample.

4 Greenfield projects from China post India’s FDI restrictions

This section evaluates the impact of the 2020 India FDI restrictions on the greenfield project investments from China to India. We analyse the impact using several steps from simple visualization and tabular presentations to a formal regression analysis.

4.1 Difference-in-difference using visualization

The impact of the FDI restrictions on India’s inbound China investments is shown using Fig. 4. The blue line plots the log of the monthly difference between the average value of the greenfield FDI projects from China (Mainland + Hong Kong) and the rest of the world. Units in the y-axis are measured in log terms. Hence, the interpretation of 1 on the y-axis corresponds to a 1 percentage difference between the average value of projects from China and rest of the world. As such, the “first difference” that we consider in the study pertains to China compared to the rest of the world as the source of greenfield FDI to India. Dashed grey vertical lines with annotated text show important events during

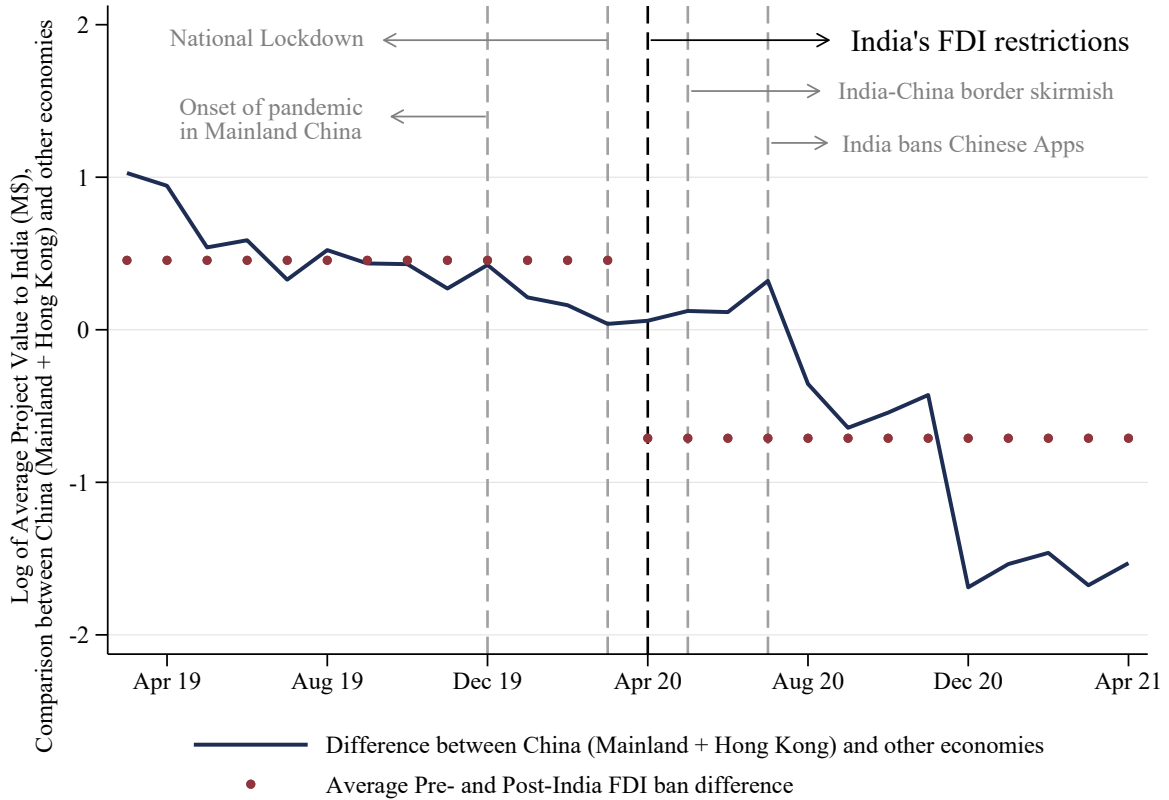


Figure 4: Difference in Greenfield FDI from China (Mainland + Hong Kong) and other markets to India

the analysis period.

The blue line shows little difference between the average value of projects from China and the rest of the world before India’s FDI restrictions. A difference emerges immediately after the FDI restrictions in April 2020. Furthermore, the difference between the value of projects from China and the rest of the world become persistently negative since December 2020.

The “second difference” in the study pertains to the timing of the event of interest: India’s suspension of the automatic approval route for FDI from neighbouring markets. The horizontal red dotted line Fig. 4 captures the mean difference in the greenfield project value from China and the rest of the world before the 2020 India FDI restrictions.⁵ The dotted red line hovers close to zero in the pre-event period and dips to -2 after the India FDI restrictions.

Table 1 shows the tabular illustration of the aforementioned point. Column (1) reveals the average value of greenfield projects from China to India as comparable to that of

⁵Only China (Mainland) and Hong Kong are active source markets of greenfield FDI among the “neighbouring markets” under purview in the FDI restrictions.

India’s projects from the rest of the world. This changed post the India FDI restrictions as the average project value from China crashed. In contrast, the value of projects from the rest of the world continues to be stable even after the FDI restrictions. Additionally, the difference in the value of greenfield projects from China and the rest of the world is negative and statistically significant post the India FDI restrictions. Since the measurement unit is in terms of log, the difference estimate in column (2) implies that the value of projects from China to India declined by 1.623% compared to projects from the rest of the world to India. The difference-in-difference estimate in column (3) is also negative and statistically significant.

Table 1: Log of average project value (USD million), Pre and Post India FDI restrictions

	Pre-India FDI restrictions (1)	Post-India FDI restrictions (2)	Difference-in-difference (3)
From China (Mainland + Hong Kong)	3.789 [0.515]	1.646 [0.313]	
From Rest of the World	3.845 [0.137]	3.269 [0.201]	
Difference	-0.057 [0.439]	-1.623** [0.682]	-1.538* [0.811]

Note: Values are averaged across countries and time periods. Pre-India FDI restrictions is the period from Jan 2019 to March 2020; Post-India FDI restrictions period refers to periods from April 2020 to April 2021. Estimates are computed using the “diff” package in Stata. Standard errors are reported in brackets. *, **, *** denotes significance level at 1, 5 and 10 percent, respectively.

Altogether, [Fig. 4](#) and [Table 1](#) show prima facie evidence that the average value of projects from China to India was almost on par with projects from the rest of the world to India. A divergence emerged after the India FDI restrictions, with the average value of projects from China dropping compared to those from the rest of the world.

4.2 Pre-existing trends: Validating the parallel trends assumption

Although the visualizations and tabular representation point to differences emerging between greenfield projects from China and the rest of the world to India, there is still a need to statistically validate the parallel trend assumption. In other words, would the average value of projects from China and the rest of the world be similar, devoid of India’s restrictions on FDI from neighbouring markets?

There are scenarios which could violate the parallel trends assumption. For example, China felt the pandemic shock much earlier than the rest of the world. As a consequence, China’s investments abroad could have already slowed compared to the investments from

the rest of the world. This would imply that the slowdown of China’s investments in India may likely be due to the pandemic shock than India’s explicit FDI restrictions. To explore the issues further, we conduct an event study analysis by estimating:

$$\ln(1 + fdi_{st}) = \alpha + \sum_{h=May2019}^{Apr2021} \beta_h D_h \times T_c + C_s + S_m + \epsilon_{st} \quad (1)$$

where fdi_{st} is the average value of greenfield FDI project from economy s to India in period t . D_h is a binary variable that takes the value 1 for the period h and 0, otherwise. T_c is the treatment dummy that takes the value 1 when the source economy s is China (Mainland or Hong Kong) and 0, otherwise. C_s and S_m account for source economy and month fixed effects, respectively.

We use the interaction between the time dummy D_h and treatment dummy T_c in Eq. (1) to check for any pre-existing trends. The blue dots in Fig. 5 shows the β_h estimates for each period h in Eq. (1), whereas the shaded light blue area corresponds to the 90% confidence interval of the estimates. β_h can be interpreted as the difference between the average value of projects from China and the rest of the world in period h as compared to the baseline period (Jan-Mar, 2019). Fig. 5 shows that the β_h estimates are not statistically different from 0 for periods before the India FDI restrictions, efficiently satisfying the parallel trends assumption.⁶ In May 2020 (immediately after the FDI restrictions), the negative estimate of β_h become statistically significant. The magnitude of the β_h coefficient enlarges in the subsequent periods while continuing to be statistically significant until the end of the event window. The fact that coefficients are negative and statistically significant from zero soon after the FDI restrictions suggests a dent in the greenfield investment creation from China to India as compared to greenfield investments from the rest of the world to India.

4.3 Empirical analysis

With the validation of the parallel trends assumption, this section explores the impact of India’s FDI restrictions on the value of greenfield projects from China to India using difference-in-difference methodology. To this end, we estimate the below equation:

$$\ln(1 + fdi_{jst}) = \alpha + \beta_{pre} T_c \times D_t^{pre} + \beta_{post} T_c \times D_t^{post} + \alpha' X_{st} + \varphi' Z_t^{India} + \gamma_{sq} + \eta_{naics2,m} + \epsilon_{jst}$$

⁶ β_h is not statistically significant if the shaded area corresponding to the coefficient falls below and above the 0 axis horizontal red line.

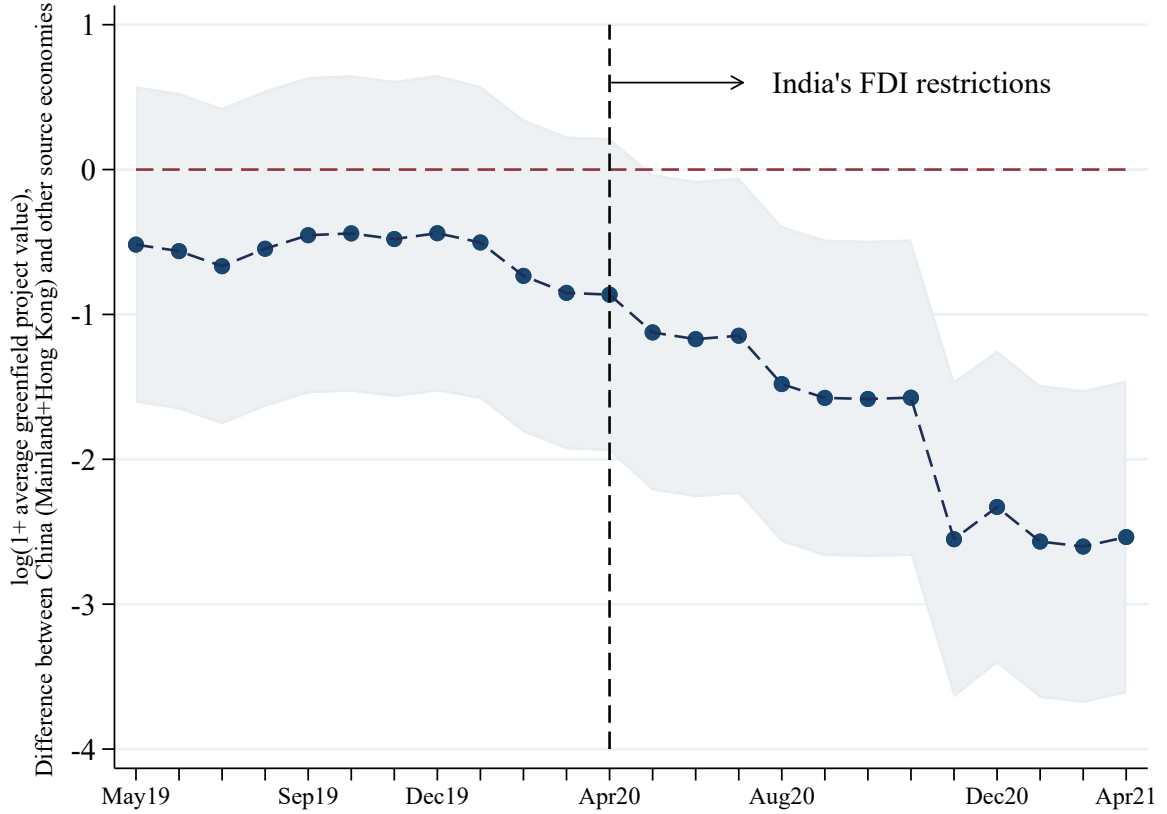


Figure 5: India FDI restrictions and the average value of greenfield projects in India, May 2019 - April 2021

(2)

where $f di_{jst}$ is the average value of greenfield FDI project in industry j from source market s to India during period t . Industry j is 6-digit NAICS classification. We use $\ln(1 + f di_{jst})$ specification of the dependent variable to account for zero values in the sample. T_c is the treatment dummy that takes the value 1 when the source economy s is China (Mainland or Hong Kong) and 0, otherwise.⁷ D_t^{pre} takes the value 1 for the pre-treatment period that extends for six months before the April 2020 FDI restrictions, and 0 otherwise. In other words, D_t^{pre} equal 1 for periods from September 2019 to March 2020. We incorporate the interaction of T_c and D_t^{pre} primarily as a check to validate whether the difference between the value of greenfield projects from China and the rest of the world exists even before the India FDI restrictions. As such, a statistically significant β_{pre} would effectively violate the parallel trends assumption (Zheng, 2020).

⁷There is no record of greenfield project investments from Macau to India during the study period in Orbis BVD database. Hence the treatment group comprise source markets of Mainland China and Hong Kong.

D_t^{post} in Eq. (2) is a binary variable that takes the value 1 for the post-treatment period from April 2020 to April 2021. The interaction of T_c and D_t^{post} constitute our key variable of interest. The β_{post} captures the difference in the average value of greenfield projects from China and the rest of the world to India after the FDI restrictions as compared to the benchmark period (Jan 2019 to Aug 2019). A negative and statistically significant β_{post} coefficient would imply that India’s FDI restrictions caused a drop in the average value of greenfield projects from China relative to that from the rest of the world.

Eq. (2) also accounts for COVID-19 pandemic shock specific covariates. \mathbf{X}_{st} is a vector of COVID-19 covariates such as new COVID-19 cases and COVID-19 stringency index of source market s in period t . Analogously, \mathbf{Z}_{st} is a similar vector of COVID-19 covariates for India in period t . Finally, γ_{sq} and η_{jm} in Eq. (2) pertains to fixed effects. The source-quarter fixed effect γ_{sq} accounts for time-varying source market characteristics that are commonly found to determine FDI flows. Finally, $\eta_{naics2,m}$ refers to 2 digit industry-month fixed effects that capture the time-varying industry factors that determine FDI flows.

Baseline Column (1) in Table 2 reports the baseline results from the estimation of Eq. (2). We find that the pre-treatment interaction coefficient ($T_c \times D_t^{pre}$) is statistically insignificant, essentially implying that the differences between the values of projects from China and the rest of the world is not statistically different from zero. This essentially satisfies the parallel trends assumption of our study’s difference in difference framework.

Consistent with our expectations, the coefficient of interest pertaining to post-treatment interaction coefficient ($T_c \times D_t^{post}$) is both negative and highly significant. This implies that India’s restrictions on FDI from neighbouring markets adversely affected greenfield investment projects from China to India. The coefficient is economically significant as the India FDI restrictions caused a decline of the project value from China relative to the rest of the world by 0.28%.

We next estimate Eq. (2) without the fixed effects and the Covid-19 control variables to verify whether the results continue to hold with a simpler specification. Column (2) in Table 2 shows that the post-treatment interaction coefficient ($T_c \times D_t^{post}$) continues to be negative and statistically significant. Columns (3)-(5) show the robustness of the results by estimating Eq. (2) with alternate specifications concerning fixed effects and COVID-19 covariates.

Robustness We also conduct several robustness checks to verify the sensitivity of the baseline results. First, we use alternate methodological specifications to re-estimate Eq. (2). Second, we use alternate FDI measures as dependent variable to estimate the

Table 2: Baseline Results

	Dependent var.: $\ln(1 + fdi_{jst})$				
	(1)	(2)	(3)	(4)	(5)
$T_c \times D^{pre}$	0.14 (0.12)	0.09 (0.10)	-0.13 (0.13)	0.04 (0.09)	-0.15 (0.13)
$T_c \times D^{post}$	-0.54*** (0.10)	-0.27*** (0.07)	-0.46*** (0.11)	-0.29*** (0.07)	-0.47*** (0.11)
Constant	0.28*** (0.01)	0.34*** (0.01)	0.35*** (0.01)	0.34*** (0.01)	0.35*** (0.01)
Source-quarter FE	Yes	No	Yes	No	Yes
Industry-month FE	Yes	No	No	Yes	Yes
COVID-19 covariates	Yes	No	No	No	No
Observations	5,880	5,880	5,880	5,880	5,880
R-squared	0.27	0.003	0.06	0.07	0.15

*, **, *** denotes significance level at 1, 5 and 10 percent, respectively. Robust standard errors are reported in the parenthesis. fdi_{jst} pertains to average value of greenfield projects in industry j from source economy s to India in period t .

effects of FDI restrictions on the intensive and extensive margin of greenfield FDI from China to India. In particular, we consider aggregate FDI inflows, the number of greenfield FDI projects and project size as alternate specifications of dependent variables.

With regard to our initial robustness check, we re-estimate [Eq. \(2\)](#) using $\ln(fdi_{jst})$ as the dependant variable specification. Using this specification would result in dropping the zero-valued bilateral average greenfield FDI project value from the sample. The results are reported under column (1) of [Table 3](#). Although negative, the post-treatment coefficient is no longer statistically significant. As such, the exclusion of the zero valued observations in the dependant variable is found to have an important bearing on the sensitivity of the baseline results.

The analysis so far used ordinary least squares (OLS) to perform the estimation. To check the validity of the baseline result, we also use the Poisson Pseudo-Maximum Likelihood (PPML) estimator proposed by [Silva & Tenreyro \(2006\)](#). Vast FDI literature has established that the PPML estimator provides consistent coefficient estimates in the presence of heteroscedasticity and measurement error. Additionally, PPML estimator also helps tackle the issue of zero FDI values in the dataset. Instead of a logarithmic

specification, we estimate Eq. (2) using fdi_{jst} as the dependent variable through PPML procedure. The results are reported under column (2) in Table 3. Yet again, with PPML estimation, we find that the average value of greenfield FDI projects from China relative to the rest of the world declined after the FDI restrictions.

Table 3: Robustness: Alternate methodological specifications

	Dependent var.: $\ln(fdi_{jst})$	Dependent var.: fdi_{jst}
	OLS (1)	PPML (2)
$T \times D^{pre}$	0.18 (0.48)	-0.51 (0.66)
$T \times D^{post}$	-0.22 (0.63)	-3.87*** (0.57)
Constant	2.52*** (0.06)	2.63*** (0.09)
Source-Quarter FE	Yes	Yes
Industry-Month FE	Yes	Yes
COVID-19 covariates	Yes	Yes
Observations	662	4,817
R-squared	0.66	0.45

*, **, *** denotes significance level at 1, 5 and 10 percent, respectively. Robust standard errors are reported in the parenthesis. fdi_{jst} pertains to the average value of greenfield FDI project in industry j from source economy s to India in period t .

Table 2 showed that the India FDI restrictions adversely impacted the average value of greenfield projects from China, which is a measure of intensive margin. We also consider an alternative measure of intensive margin, namely project size, as dependent variable in the estimation of Eq. (2).⁸ Column (1) in Table 4 shows the robustness of the baseline results even while using an alternate specification of intensive margin. Aggregate greenfield FDI is determined by value of greenfield projects (intensive margin) and the number of greenfield projects (extensive margin). As such, we next estimate Eq. (2) with the number of greenfield projects (extensive margin) as the dependent variable. We can infer from the statistically significant and negative $T_c \times D_t^{post}$ coefficient in column (2) that the number of greenfield FDI projects from China to India also fell after India's FDI restrictions. Overall, columns (1)-(2) give evidence that both intensive and extensive margin of FDI from China to India shrunk significantly after the FDI intervention from

⁸Project size is derived by dividing aggregate FDI by number of projects.

India. Consequently, it is intuitive to hypothesize that aggregate FDI inflows from China to India declined. Column (3) in [Table 4](#) reaffirms our expectation that aggregate FDI inflows to India from China relative to the rest of the world dropped after India’s FDI restrictions.

Table 4: Robustness: Alternate specifications of the dependent variable

	Dependent var.: $\ln(1 + fdi_{jst})$		
	Project Size (1)	Number of projects (2)	Aggregate FDI (3)
$T \times D^{pre}$	-0.13 (0.12)	-0.05 (0.04)	-0.14 (0.14)
$T \times D^{post}$	-0.53*** (0.10)	-0.19*** (0.04)	-0.62*** (0.11)
Constant	0.28*** (0.01)	0.11*** (0.00)	0.33*** (0.02)
Source-Quarter FE	Yes	Yes	Yes
Industry-Month FE	Yes	Yes	Yes
COVID-19 covariates	Yes	Yes	Yes
Observations	5,880	5,880	5,880
R-squared	0.27	0.29	0.27

*, **, *** denotes significance level at 1, 5 and 10 percent, respectively. Robust standard errors are reported in the parenthesis. fdi_{jst} pertains to the FDI measure in industry j from source economy s to India in period t . Aggregate FDI, number of projects and project size are the alternate specifications of the dependent variable that we consider for estimating [Eq. \(2\)](#): a) Aggregate FDI is the sum total of greenfield FDI project investments in industry j from source country s in period t . b) Number of projects refers to the total number of greenfield FDI projects in industry j from source country s in period t . c) Project size is defined by dividing aggregate FDI inflows with number of projects.

Industries affected by the 2020 India FDI restrictions Although we find evidence that the FDI restrictions adversely affected the greenfield project investments from China, it is likely that the effect varied across industries, with some industries experiencing more impact than the others. In other words, is there an industrial heterogeneity in how India’s FDI restrictions affected the greenfield project investments from China to India? To investigate this further, we repeat the baseline estimation separately for

each sub-sample of industries at the NAICS two digit level. The red dots in Fig. 6 show the $T_c \times D_t^{post}$ coefficient for each industry sub-samples. Although the coefficients are negative across all industries, the post-treatment coefficient is statistically significant for only two industries; namely professional, scientific and technical Services and manufacturing: metals, electrical equipment & motor Vehicles. Driven by *Make in India* program, China's investments in India was heavily concentrated in automobile and smartphone manufacturing. Thus, it is intuitive that the impact of India's FDI restrictions targeting China was largely felt by manufacturing of metals, electrical equipment & motor vehicles industry.

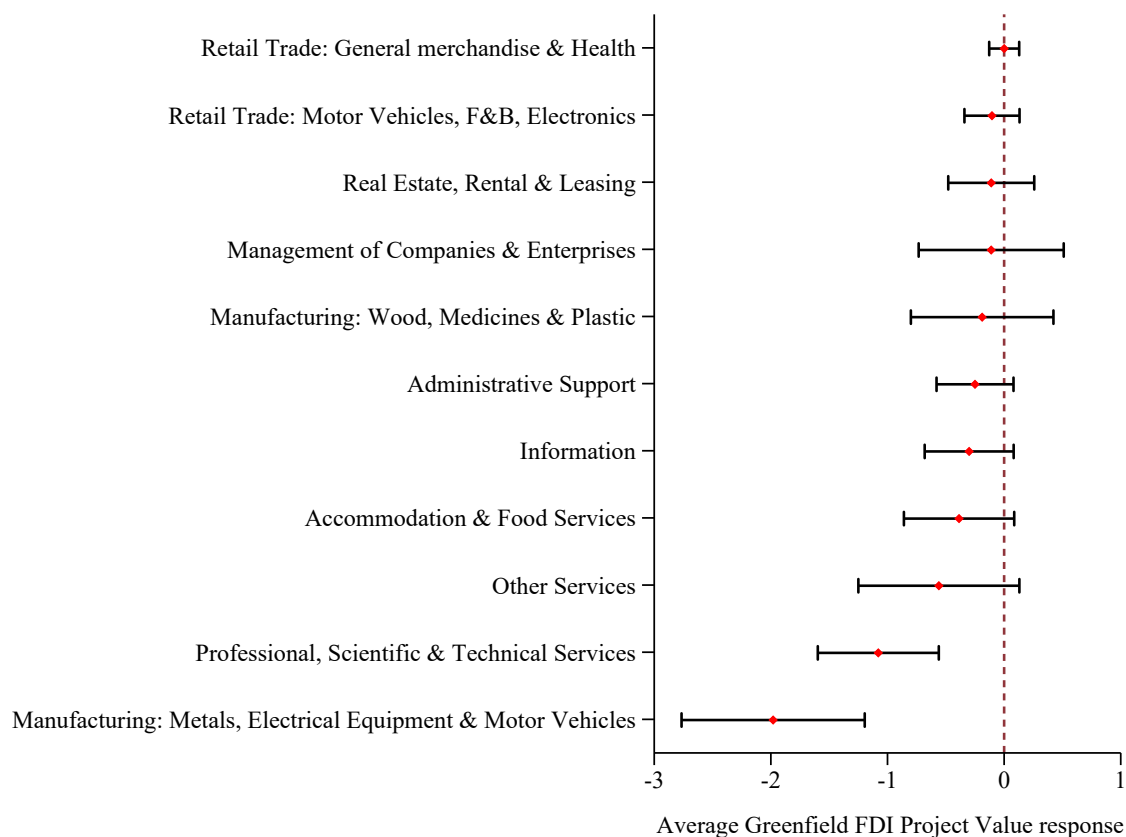


Figure 6: Sub-sample regression: Heterogeneous FDI response across industries

This figure plots the post-treatment coefficient in Eq. (2) pertaining to each industry specified in the y-axis. The estimates and their respective confidence intervals are denoted by the diamond and the horizontal lines.

5 International spillovers of the India FDI restrictions: Did China reallocate investments?

The results in [Section 4](#) show that the greenfield investments from China to India contracted after India’s explicit ban on automatic route FDI from neighbouring markets. Since the investments from China to India faced this roadblock, it is very likely that China diverted its outward greenfield FDI flows intended from India to other emerging markets. This section evaluates the international spillovers of India’s FDI policy in terms of China’s reallocation of FDI to emerging markets after India’s FDI policy.

To test whether a reallocation in FDI flows from China occurred after the India FDI restrictions, we conduct a difference in difference analysis again. The data sample for the analysis comprises bilateral greenfield FDI projects which flow from all markets to emerging markets during the period of study (Jan 2019 to April 2021). To identify the reallocation effects, we exclude the destination markets of India and China from the sample and estimate a variant of [Eq. \(2\)](#) as defined below:

$$\ln(fdi_{jstdt}) = \alpha + \beta_{pre} T_c \times D_t^{pre} + \beta_{post} T_c \times D_t^{post} + \alpha' \mathbf{X}_{st} + \varphi' \mathbf{Z}_{dt} + \gamma_{sq} + \vartheta_{dq} + \theta_{sd} + \eta_{maics2,m} + \epsilon_{jstdt} \quad (3)$$

where fdi_{jstdt} is the average FDI project value from source market s to destination market d in industry j during period t . As in the case of the baseline model, T_c is treatment dummy that takes the value 1 if the source market is China (Mainland and Hong Kong) and 0, otherwise. This implies that the treatment group comprise greenfield FDI projects from China to emerging markets (excluding India). As such, the control group pertains to greenfield projects from all markets other than China to emerging markets. D_t^{pre} and D_t^{post} also pertains to the same definitions of the event period window as in [Eq. \(2\)](#). As explained previously, $T_c \times D_t^{pre}$ is incorporated to validate parallel trends assumption. Our coefficient of interest is β_{post} . A positive and statistically significant β_{post} would imply that the average value of greenfield FDI projects from China to emerging markets increased as compared to projects from the rest of the world to emerging markets after India’s FDI policy intervention in April 2020. In other words, such a finding would give evidence that China reallocated its investments to emerging markets after India’s FDI restrictions.

Since the empirical analysis constitute bilateral FDI flows from all markets to emerging markets (not India alone as in [Eq. \(2\)](#)), we incorporate additional fixed effects to account for time-invariant bilateral factors such as distance between source and destination markets. As such, θ_{sd} in [Eq. \(3\)](#) refers to source-destination fixed effects to account

for time-invariant bilateral characteristics commonly found to determine FDI flows.

Evidence of China FDI reallocation The results from the estimation of Eq. (3) are reported in Table 5. In column (1), the positive and statistically significant $T_c \times D_t^{post}$ coefficient gives evidence that China increased the average value of greenfield project investments to emerging markets in comparison to the rest of the world after the FDI policy intervention of India. Thus, there are indeed international spillovers of India’s FDI restrictions that indirectly benefited other emerging markets.

As explained previously, the average project value of greenfield project investments measures the intensive margin of FDI. We re-estimate Eq. (3) with an alternate measure of intensive margin, namely project size. The estimation results in column (2) reiterate the robustness of the result that China’s FDI intensive margin to emerging markets expanded after India’s FDI restrictions. However, similar results do not hold for FDI extensive margin which is measured using number of bilateral greenfield FDI projects. The statistically insignificant post-treatment results from column (3) reveal no change in the number of greenfield FDI projects from China to emerging markets post the FDI policy intervention from India.

Both extensive and intensive margins determine the aggregate FDI flows. We next explore the impact of India’s FDI restrictions on aggregate FDI inflows from China to emerging markets other than India. The results in column(4) show that bilateral FDI inflows from China to emerging markets expanded after the new FDI rule from India. Taken together, the results in Table 5 show that the reallocation of China’s greenfield investments to emerging markets was driven by expansion in the size of existing investments than starting new projects.

Industrial heterogeneity in China FDI reallocation To explore the China FDI reallocation patterns in each industry, we revise Eq. (3) as below:

$$\ln(fdi_{jsdt}) = \alpha + \beta_{pre} T_c \times D_t^{pre} + \sum_h \beta_{post} T_c \times D_t^{post} \times D^h + \boldsymbol{\alpha}' \mathbf{X}_{st} + \boldsymbol{\varphi}' \mathbf{Z}_{dt} + \gamma_{sq} + \theta_{sd} + \epsilon_{jsdt} \quad (4)$$

where D^h is a binary variable that takes the value 1 if NAICS-2 digit industry is h and 0, otherwise. The triple interaction coefficient $T_c \times D_t^{post} \times D^h$ shows the difference in greenfield investments in emerging markets from China relative to the rest of the world after the India FDI restrictions pertaining to industry h . The triple interaction coefficient estimates for each industry and their respective 90% confidence intervals are reported in Fig. 7. It is interesting to note that emerging markets witnessed a surge in greenfield

Table 5: China’s reallocation of greenfield FDI after India’s FDI restrictions

	Dependent var.: $\ln(fdi_{jst})$			
	Average project value (1)	Project Size (2)	Number of projects (3)	Aggregate FDI (4)
$T \times D^{pre}$	0.18 (0.21)	0.14 (0.22)	-0.01 (0.08)	0.12 (0.24)
$T \times D^{post}$	0.37** (0.18)	0.38** (0.18)	-0.03 (0.09)	0.34* (0.21)
Constant	2.20*** (0.02)	2.18*** (0.02)	0.30*** (0.01)	2.49*** (0.02)
Source-Quarter FE	Yes	Yes	Yes	Yes
Destination-Quarter FE	Yes	Yes	Yes	Yes
Source-Destination FE	Yes	Yes	Yes	Yes
Industry-Month FE	Yes	Yes	Yes	Yes
COVID-19 covariates	Yes	Yes	Yes	Yes
Observations	3,726	3,726	3,908	3,726
R-squared	0.67	0.67	0.26	0.59

*, **, *** denotes significance level at 1, 5 and 10 percent, respectively. Robust standard errors clustered at source-destination are reported in the parentheses. fdi_{jst} pertains to the FDI measure in industry j from source economy s to India in period t . Average project value, aggregate FDI, number of projects and project size are the alternate specifications of the dependent variable that we consider for estimating Eq. (2): a) Average project value is the average value of greenfield projects in industry j from source market s to destination market d in period t . b) Aggregate FDI is the sum total of greenfield FDI project investments in industry j from source country s to destination market d in period t . c) Number of projects refers to the total number of greenfield FDI projects in industry j from source country s to destination market d in period t . d) Project size is obtained by dividing aggregate FDI inflows with number of projects.

project investments from China post 2020 India FDI restrictions across several industries.

While it is intuitive to substantiate an increase in China’s investments in the manufacturing of metals, electrical equipment, and motor vehicles – corroborated by the significant decline of China’s FDI in similar industries in India (see Fig. 6), decoupling the reasons for other industries may not be as straightforward. Although the decline in China’s FDI to India in the two industries – administrative support and manufacturing of wood, medicine, and plastics – was statistically insignificant (see Fig. 6), the reallocation results show a significant expansion in FDI from China in these industries (see Fig. 7). This, we argue, is possibly an overcompensation in Chinese reallocation efforts to counter any declines owing to Indian FDI restrictions. For the period under study, the industries – utilities, and postal, warehousing and storage in India did not experience any inflow of FDI from China. A post-treatment increase in China’s investments to emerging markets in these industries could arguably be explained by a growth of its existing investments in

markets where China reallocated.

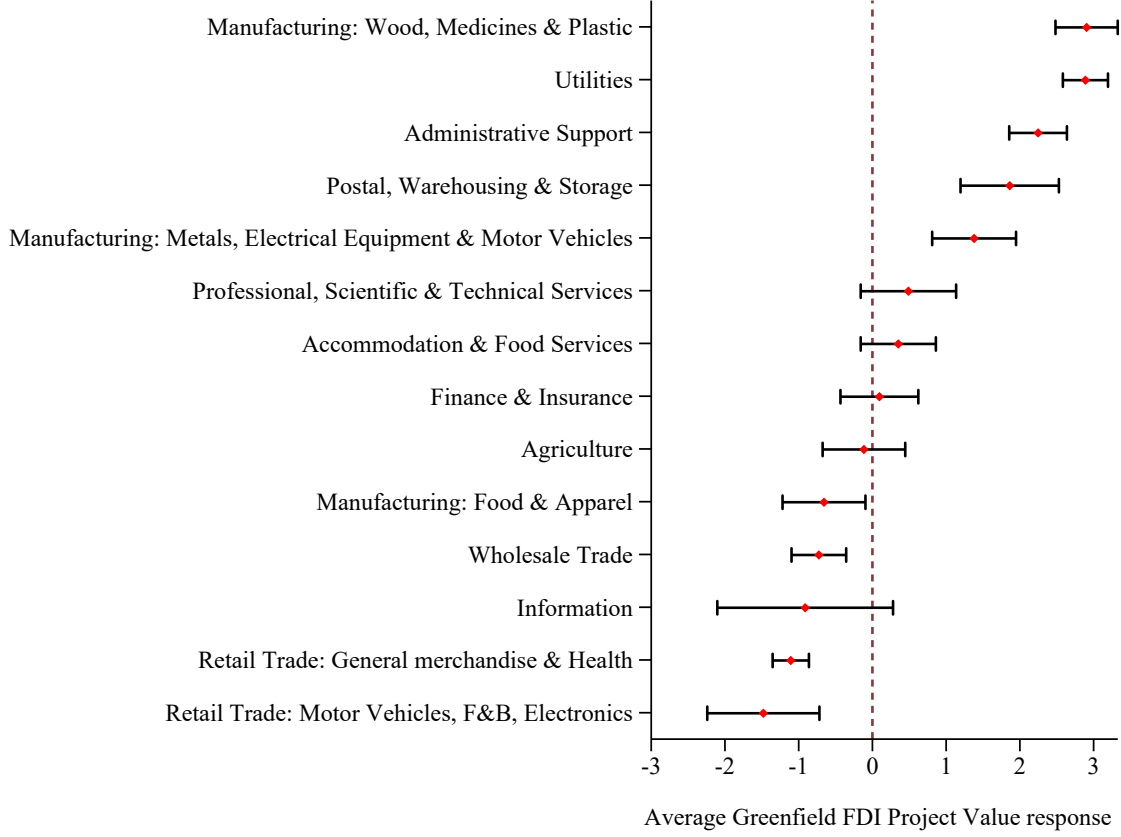


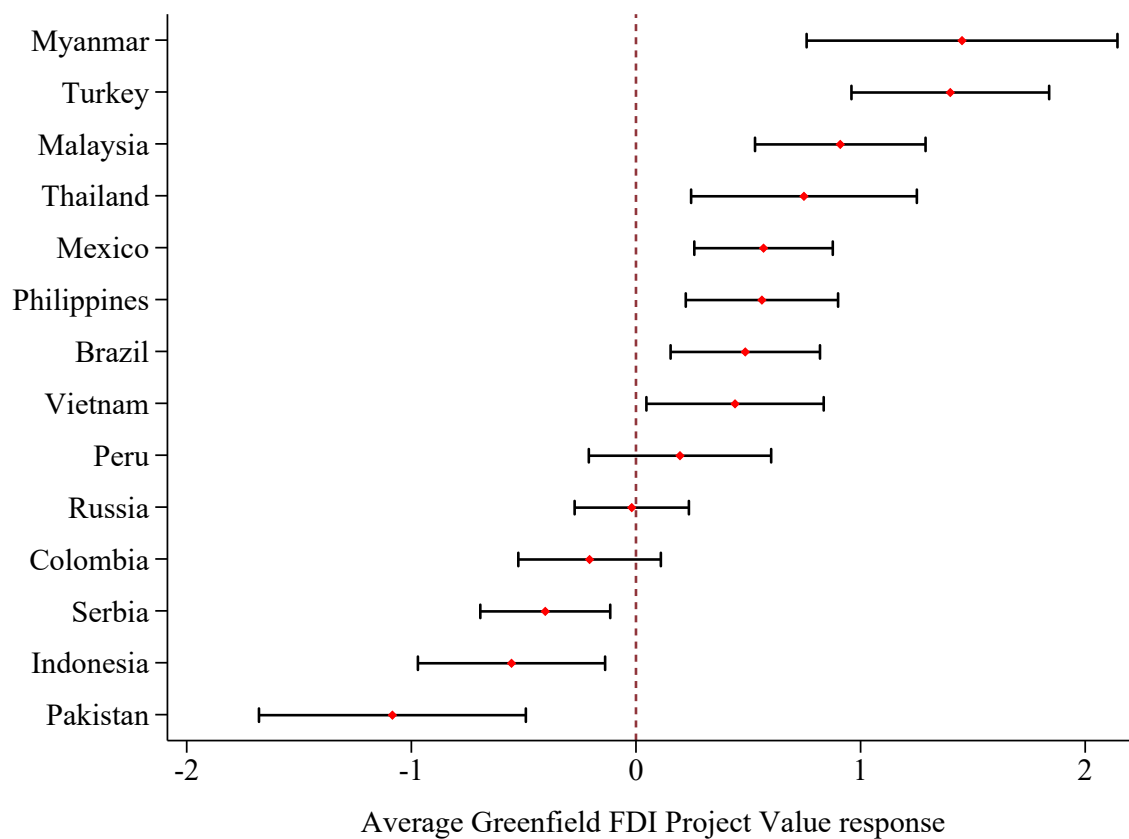
Figure 7: Industrial heterogeneity of China's reallocation post 2020 India FDI restrictions

This figure plots the post-treatment coefficient in Eq. (4) pertaining to each industry specified in the y-axis. The estimates and their respective confidence intervals are denoted by the diamond and the horizontal lines, respectively.

Destinations benefiting from China FDI reallocation Although we find evidence that China reallocated investments to emerging markets on average after India's policy intervention, specific destinations could have gained more from this investment reallocation. To identify emerging market destinations which experienced a surge in greenfield investments from China after India's FDI restrictions, we revise Eq. (3) to:

$$\ln(fdi_{jsdt}) = \alpha + \beta_{pre} T_c \times D_t^{pre} + \sum_d \beta_{post} T_c \times D_t^{post} \times D^d + \alpha' X_{st} + \varphi' Z_{dt} + \gamma_{sq} + \theta_{sd} + \eta_{naics2,m} + \epsilon_{jsdt} \quad (5)$$

where D^d is a binary variable that takes the value 1 for destination market d and 0, otherwise. The triple interaction coefficient $T_c \times D_t^{post} \times D^d$ shows the difference in greenfield investments between China and the rest of the world to destination market d after the India FDI restrictions. The triple interaction coefficient estimates for each destination market and their respective 90% confidence intervals are reported in Section 5. We find that several emerging markets experienced a surge in the average value of greenfield FDI projects from China after the India FDI policy. It is interesting to note that several emerging markets in ASEAN – Myanmar, Malaysia, Thailand, and Philippines, and Latin America – Mexico and Brazil, benefited from China’s diversion of greenfield FDI that was intended for India.



This figure plots the post-treatment coefficient in Eq. (5) pertaining to each EME specified in the y-axis. The estimates and their respective confidence intervals are denoted by the diamond and the horizontal lines, respectively.

While some markets gained, others such as Indonesia, Pakistan and Serbia suffered a decline in incoming investments from China. We speculate that China perhaps diverted to expand its existing investments in its more established and steadfast economic partners in ASEAN and Latin America. Countries like Malaysia, Mexico, and Vietnam were similar to India when it came to China’s investment presence in these markets before

the FDI policy intervention – with heavy investments in the manufacturing of metals, electronics, electrical equipment, and motor vehicles. Naturally, roadblocks in FDI to India compelled China to divert its investments in these industries to these markets. For example, in December 2020, China’s solar product manufacturer, Seraphim Solar System decided to expand its capacity by setting up a 750-megawatt module assembly factory in Vietnam ([Mercure, 2020](#)). In November 2020, a leading IT Asset Disposition (ITAD) service provider from Shanghai announced to expand its existing ITAD operations in Latin America with the opening of a facility in Mexico City, Mexico ([Financial Post, 2020](#)). Another big ticket investment was made in September 2020 by Chinese renewable energy company Mingyang Smart Energy to build an offshore wind farm in Ceará, Brazil ([Yu, 2020](#)).

6 Conclusion

During periods of economic downturn, FDI policies of destination markets become restrictive to avoid opportunistic takeovers of domestic firms. India’s suspension of automatic route FDI from bordering economies after the Covid-19 pandemic onset is an example of such a restrictive FDI policy. Applying a difference in difference framework to bilateral greenfield project investments data from Orbis BVD database, this study finds that the 2020 FDI restrictions from India caused the average value of greenfield projects from China to India to decline relative to the projects from the rest of the world to India, with the impact felt more by industries such as manufacturing of metals, electrical equipment motor vehicles, and professional & technical services. The study also finds evidence of international spillovers with other emerging markets benefiting from a surge in incoming greenfield project investments after the 2020 India FDI restrictions. China reallocated its outward greenfield FDI to other EMEs, with ASEAN and Latin American economies receiving the bulk of diverted investments. Our findings merit further research to explore whether China’s reallocated investments to the aforementioned emerging markets indirectly aided in their post-pandemic economic recovery, which we leave for future research.

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