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The Impact of Policy Uncertainty on Foreign Direct Investment in Services: Evidence from firm-level data and the role of regional trade agreements*

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Abstract

This study quantifies the role of regional trade agreements (RTAs) in reducing policy uncertainty (PU) on foreign direct investment (FDI) in services. PU regarding local rules and regulations discourages foreign investors from entering the service sector. Service chapters in RTAs become a fresh ingredient in quantifying such PU in host countries by creating legally bound commitments. Focusing on these commitments, this study evaluates how the activities of foreign affiliates of Japanese multinational enterprises are affected by the service chapters in RTAs with sector-specific commitments, such as market access (MA), national treatment (NT), and most favored nation (MFN) signed by Japan between 1995 and 2018. We find that a reduction in PU regarding MFN encourages the establishment of new foreign affiliates. We also find that a reduction in PU regarding NT increases the ownership ratio of foreign affiliates. These findings highlight a new and vital role for RTAs in the extensive and intensive margins of FDI in services.

Keywords: policy uncertainty, service chapters in regional trade agreements, binding commitments, FDI in services

JEL classification: F15, F21, F23

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1. Introduction

Regional trade agreements (RTAs) have contributed to reducing barriers to foreign direct investment (FDI) as well as international trade (Matto et al., 2020). As signing them is effective for relaxing domestic rules and regulations on service sectors in host countries, it is expected that RTAs also reduce barriers to trade and FDI in services. However, previous studies have demonstrated that RTAs reduce tariff-equivalent trade costs for services only modestly (Miroudot and Shepherd, 2014). Thus, more research is needed on how RTAs affect FDI in services.

The important issue is how policy uncertainty (PU) affects FDI in services and to what extent RTAs can encourage FDI in services by reducing PU. In trade literature, the effects of PU on trade have been investigated (Handley, 2014; Handley and Limão, 2015, 2017). PU represents uncertainty in future policies implemented by the governments. FDI in services requires a sunk cost to learn about domestic rules and regulations in a host country. Foreign investors would be discouraged from entering service sectors if PU is sufficiently high. It typically measures some gaps between the actual trade regime and binding commitments under international trade agreements. It is, for example, measured by the gap between the applied and the bound levels of tariff (Handley, 2014). Against this backdrop, the role of RTAs in reducing PU has received attention in studies on trade in services. RTAs create the gap between the actual trade regime and the commitments permitting a more restrictive regime in the future, which enable us to disentangle the effect of PU on trade in services (Ciuriak et al., 2020, Lamprecht and Miroudot, 2020).[1]

To broaden our understanding of the role of RTAs in reducing PU on FDI in services, this study considers the specific approach to scheduling binding commitments, or reservations for non-conforming measures, in services chapters of RTAs. There are different types of approaches that preserve flexibility for introducing policy limitations: the General Agreements on Trade in Services (GATS)-inspired and the North American Free Trade Agreement (NAFTA)-inspired approach (Roy et al., 2007). RTAs following the GATS-inspired approach use positive list, like the GATS, whereby the relevant liberalizations are applied only to sectors listed, which are subject to the limitations inscribed. RTAs following the NAFTA-inspired approach use a negative list whereby the relevant liberalizations apply to all services sectors unless a host country specifically lodges a reservation destined to preserve the non-conforming regulatory measures. This approach provides more comprehensive commitments than the GATS-inspired one. While the GATS-inspired approach only allows for commitments on market access (MA) and

[1] Ahmad et al. (2023) use the gap between pre- and post-Brexit preferential restrictions on trade in services and find that Brexit-induced PU lowers UK service exports.

national treatment (NT), the NAFTA-inspired approach allows for commitments to be filled with respect to not only MA and NT but also the most favored nation treatment (MFN) (Gootiiz et al., 2020).[2] Thus, the NAFTA-inspired approach provides more complete and transparent road map of remaining policy limitations on FDI in services.

Lamprecht and Miroudot (2020) have recently taken a step further by focusing on the GATS-inspired approach to scheduling the commitments in services chapters of RTAs, and quantify the value of binding service trade regimes through MA and NT commitments. Relative to Lamprecht and Miroudot (2020), this study focuses on a NAFTA-inspired approach to scheduling the commitments in services chapters of RTAs, and aims to quantify reservation on liberalization commitments, such as MA, NT, and MFN.[3] Moreover, this study examines two different types of reservations of certain obligations in RTAs: reservation with standstill obligations and reservation without standstill obligations. In the former, a standstill obligation gives contracting parties a guarantee that a host country is not allowed to introduce new non-conforming measures beyond those included in RTAs reservation lists. This obligation implies that the actual trade regime cannot become more restrictive than the regime at the time the agreement became effective, leading to a decrease in the level of PU.[4] On the other hand, in reservation without standstill obligations, new restrictive measures can be introduced in the future, regardless of whether or not the non-conforming measures are currently applied. This obligation implies that the actual trade regime can be more restrictive in the future, leading to an increase in the level of PU. These reservations in RTAs were not previously compared in studies of trade and FDI in services.

There are several previous studies related to this study. First, this study is related to firm-level studies on trade in services (Breinlich and Criscuolo, 2011; Haller et al., 2014; Kelle et al., 2013; Malchow-Møller et al., 2015; Morikawa, 2019). Crozet et al. (2016) use information on the level of market regulations for 26 countries and examine the impact of domestic regulations on firm exports of professional services; however, these studies do not deal with the issue of PU on FDI in services. Second, this study is related to studies on the impact of commitments in RTAs on trade in services (Lee, 2019; Zhou and Whally, 2014). These studies focus on RTA commitments of GATS-

[2]Typically, the NAFTA-inspired approach allows the obligation to forbid local presence (LP) requirements. It does not affect commercial presence (GATS Mode 3) directly, but affects it indirectly via reallocating the other modes of trade in services. Accordingly, we do not focus on the effect of this obligation on FDI in services and control for its confounding effects in the empirical part.

[3]Although NAFTA does not include obligatory provisions on MA, some RTAs that Japan signed include it.

[4]A ratchet obligation, which incorporates automatic commitments to decrease flexibility with regard to future measures, is excluded from service chapters in NAFTA-inspired RTAs that Japan signed until 2018.

plus (i.e., commitments falling under the mandate of GATS but going beyond the commitments at the multilateral level), but do not focus on PU measured by RTAs.

Finally, this study is related to the studies on the impact of PU on services trade at the aggregated sector level (Ciuriak et al., 2020; Lamprecht and Miroudot, 2020). Their studies utilize the OECD's Services Trade Restrictiveness Index (STRI) to capture the restrictiveness of actual policy applied by countries concerning trade in services. They measure the discrepancy between the STRI and the schedules of commitments in trade agreements (the GATS and the GATS-inspired RTAs) for PU. However, individual commitments are aggregated as sector-level composite indicators in the STRI regulatory database. This will be a possible source of measurement error. By contrast, this study uses microdata on Japanese foreign affiliates and information on Japan's RTAs with the host countries of Japanese MNEs. We focus on five RTAs between Japan and its partner countries that entered into force during 1995–2018. The use of microdata on Japanese foreign affiliates enables us to focus on the individual reservation on commitments at a disaggregated level, providing a new point of view for exploring between PU and FDI in services at the host country level while complementing existing empirical studies that utilize services trade data at the firm level and that utilize aggregated sector-level PU index as captured by the difference between the STRI information and schedules of commitments in RTAs.[5]

Nevertheless, there is a difference in measuring PU between previous studies and the present study, which leads to our identification strategy. As mentioned, PU in previous studies is often measured by some gaps between the actual trade regime and RTA commitments; in contrast, this study, similar to the strategy in Inada and Jinji (2020), controls omitted variable bias, which may arise in a study of the effect of PU on FDI in services, by focusing on NAFTA-inspired RTA commitments that assign treatment and control groups. For example, FDI inflows to affected sectors in which the host country has comparative advantage may be smaller than those in other sectors. This would result in overestimating a negative effect of PU on FDI inflows. NAFTA-inspired RTA commitments provide, however, variations across sectors in terms of changes in PU. In a host country, all foreign investing affiliates retain the same degree of PU before an RTA enters into force; meanwhile, affiliates in the sectors not included

[5]We build on Inada and Jinji (2020)—who examine the effect of NAFTA-inspired investment chapters of RTAs and international investment agreements (IIAs) on FDI—and adapt the methodology to NAFTA-inspired service chapters of RTAs. Despite the fact that commercial presence in services is typically subject to some obligations in both investment and service chapters, we consider the effects of individual commitments specific to NAFTA-inspired service chapters of RTAs such as MA and LP. Urata and Baek (2022) investigate the impact of IIAs, which include RTAs with investment chapters, on FDI in general by constructing variables to measure the quality of IIAs based on the information on provisions included in each IIA. However, they do not consider the effects of IIAs on PU.

in RTA commitments remove the degree of PU after the RTA enters into force, whereas those in the sectors included in RTA commitments continue to retain the same degree of PU. This sectoral variation enables us to measure the effects of retained PU in affected sectors by comparing the affected and non-affected sectors before and after the entry into force of RTAs in the difference-in-differences (DID) design. One may think that our identification strategy is not consistent with the measurement of PU in previous studies. While it is true that we do not directly measure the gap between the actual trade regime and RTA's binding commitments, our strategy may offer researchers another approach to detecting the potential PU in FDI in services.

The remainder of this study is organized as follows. Section 2 explains our empirical strategy. Section 3 describes the data. Section 4 provides empirical evidence showing that PU measured by binding commitments affect FDI in services. Finally, Section 5 concludes the paper.

2. Empirical strategy

2.1. Negative lists in RTAs

The data on RTA commitments are extracted from the negative lists in the annex of RTAs' legal texts. Negative lists indicate which sectors are exempted from certain commitments and obligations in RTAs. Typically, Annex I includes the lists with standstill obligations, and Annex II the lists without standstill obligations. Based on UNCTAD (2006, pp. 25 -26), this study refers to negative lists with standstill obligations as current reservation and those without standstill obligations as a future reservation. Detailed information on the negative lists is also extracted from the legal texts of each RTA, but in most of the NAFTA-inspired RTAs that Japan signed, negative lists of service and investment chapters are integrated into a single annex (including Annex I and Annex II).[6] Nevertheless, these integrated negative lists specify whether certain commitments and obligations are applied to commercial presence (FDI in services) or other trade in services, allowing us to substantially measure the effect of NAFTA-inspired service chapters of RTAs on FDI in services.

2.2. Conceptual framework for detecting PU

(Insert Figure 1 here.)

[6]This integrated negative list is included in Japanese RTAs signed with Mexico, Chile, and Australia.

Figure 1 summarizes a general conceptual framework for detecting PU due to RTAs. This figure shows the difference of PU change between the sectors included in negative lists and those not included in negative lists before and after an RTA enters into force. Before the RTA enters into force, all foreign affiliates faced the same degree of PU. The bold arrow to the right indicates the time before and after the RTA took effect. We assume the mean initial PU level before an RTAs entry into force to X. After the RTA enters into force, affiliates in the sectors not included in the negative lists drop to zero, whereas affiliates in the sectors included in the negative lists can retain the PU at level X. These sectoral differences in the change of PU enable us to capture the initial level of PU on FDI in services.

(Insert Figure 2 here.)

(Insert Figure 3 here.)

Figure 2 and 3 show the sectoral differences of PU when affected sectors are included in the current or future reservation. In Figure 2, before the RTA enters into force, all foreign affiliates faced the same degree of PU at level X; in contrast, after the RTA enters into force, affiliates in the sectors not included in the negative lists drop down to zero, whereas affiliates in the sectors included in the current reservation experience no change or even a decrease in the PU degree. This possible range of the PU is depicted by the area below level X. The area is expanded only to the lower PU degree because of the standstill obligation. This causes a decrease in mean PU measured by the sectoral differences between the sectors included in the current reservation and those not included in negative lists before and after an RTA enters into force.

In Figure 3, before the RTA enters into force, all foreign affiliates remained at the same degree of PU at level X; in contrast, after the RTA enters into force, affiliates in the sectors not included in the negative lists drop to zero, whereas affiliates in the sectors included in the future reservation experience any change or even an increase in the PU degree. This possible range of the PU is spread to the area over and below level X. The area may be expanded to the higher PU degree over time because of no standstill obligation. This causes an increase in mean PU measured by the sectoral differences between the sectors included in the future reservation and those not included in negative lists before and after an RTA enters into force.

2.3. Empirical strategy

We analyze the effect of establishing negative lists in RTAs on FDI in services. Specifically, we focus on individual reservation for liberalization commitments: MA, NT, and MFN.

Our empirical strategy is a DID estimation:

$$\hat{\beta}_{DID} = \{E[Y^{\text{affected}}_{1ijkct}|j, k't, ct, k'c, \boldsymbol{X}_{it}, \boldsymbol{Z}_{kct}, \boldsymbol{D}_{kct}] - E[Y^{\text{affected}}_{0ijkct}|j, k't, ct, k'c, \boldsymbol{X}_{it}, \boldsymbol{Z}_{kct}, \boldsymbol{D}_{kct}]\}$$
$$- \{E[Y^{\text{unaffected}}_{1ijkct}|j, k't, ct, k'c, \boldsymbol{X}_{it}, \boldsymbol{Z}_{kct}, \boldsymbol{D}_{kct}] - E[Y^{\text{unaffected}}_{0ijkct}|j, k't, ct, k'c, \boldsymbol{X}_{it}, \boldsymbol{Z}_{kct}, \boldsymbol{D}_{kct}]\}, \tag{1}$$

where $E[Y^{\text{affected}}_{0ijkct}|\cdot]$ and $E[Y^{\text{affected}}_{1ijkct}|\cdot]$ denote the conditional expectation of outcome variables in the affected sectors before and after an RTA becomes effective, respectively, while $E[Y^{\text{unaffected}}_{0ijkct}|\cdot]$ and $E[Y^{\text{unaffected}}_{1ijkct}|\cdot]$ indicate the conditional expectation of outcome variables in non-affected sectors before and after an RTA becomes effective, respectively. *Affected* in our analysis comprises sectors in the negative RTA lists, while *unaffected* comprises sectors not included in these lists. i indicates a foreign affiliate, j indicates a parent firm, k is the affiliate's four-digit sector, k' is the affiliate's two-digit sector, c is the host country, and t is the year. $\boldsymbol{X}_{it}$ represents the time-varying controls of affiliate i, which include sales, employment, and R&D intensity. $\boldsymbol{Z}_{kct}$ is the sector-level GDP and the number of workers in host country c. $\boldsymbol{D}_{kct}$ is a vector of treatment variables.

To implement the DID estimation, we estimate the following equation:

$$\begin{aligned} Y_{ijkct} &= \alpha + \sum_l \beta^l NegativeList^l_{kc} \times Post_{ct} + \boldsymbol{X}_{it} + \boldsymbol{Z}_{kct} \\ &\quad + \lambda_j + \lambda_{k't} + \lambda_{ct} + \lambda_{k'c} + \epsilon_{ijkct}, \end{aligned} \tag{2}$$

where Y_{ijkct} is an outcome variable; $NegativeList^l_{kc}$ is an indicator variable that takes one if sector k (created from the Basic Survey on Overseas Business Activities, four-digit sector) is included in the negative lists for the reservation of type l in an RTA between Japan and host country c, and zero otherwise; and $Post_{ct}$ is an indicator variable that takes one for years after an RTA enters into force, and zero otherwise. In Eq.(2), a constant term (i.e., α) and fixed effects, represented by λ_j, $\lambda_{k't}$, λ_{ct}, and $\lambda_{k'c}$, are also included, while ϵ_{ijkct} is the error term.

In this study, we use four outcome variables Y_{ijkct}: (a) an affiliate entry dummy, (b) an affiliate exit dummy, (c) the logarithm of capital investment by an affiliate, and (d) affiliate's ownership ratio of Japanese parent firms. The affiliate entry dummy, $\mathbb{1}_{entry>0,\ ijkct}$, takes one if foreign affiliate i is newly established by parent firm j in sector k of host country c in year t, and zero otherwise. The two former variables can measure the extensive margins of FDI, while the two latter variables can capture one aspect of the intensive margin of FDI.

For $NegativeList^l_{kc}$, we include the reservations in MA, NT, and MFN separately. We further distinguish between current and future reservation. We thus include the following six variables of interest as $NegativeList^l_{kc}$: (i) $MA\_current_{kc}$,

(ii) MA_future_{kc}, (iii) $NT\_current_{kc}$, (iv) NT_future_{kc}, (v) $MFN\_current_{kc}$, and (vi) MFN_future_{kc}. For example, $NT\_current_{kc}$ takes one if sector k is included in the negative lists in current reservation for the reservation on NT in an RTA between Japan and host country c, and zero otherwise. NT_future_{kc} takes one if sector k is included in the negative lists in future reservation for the reservation on NT in an RTA between Japan and host country c, and zero otherwise.

In addition, we control for the effect of LP requirements ($LP\_current_{kc} \times Post_{ct}$ and $LP\_future_{kc} \times Post_{ct}$) in Eq.(2). As known, trade in services consist of four different modes of supply, which typically relate to each other. If firms are free to choose their modes of supply, they will choose the most cost-effective mix complementarily (Copeland and Matto, 2008). Even when modes of supply are substitutes, restrictions on which modes are available to firms may force them to choose the cost-effective combination of modes.[7] To deal with this potential relationship among modes, we control for the confounding effect of LP requirements to disentangle the effect of the reservations on FDI in services.

The expected sign of β^l differs among outcome variables. We expect $\beta^l < 0$ for the affiliate entry dummy, capital investment, and ownership capital, because foreign investors may become reluctant to invest in the sectors facing higher PU regarding competitive environment with domestic rivals or other foreign investors in the host country. By contrast, the expected sign of β^l for the affiliate exit is ambiguous because PU may not affect directly the exit/stay decision of affiliates in the market.

2.4. Identifying assumption

The identifying assumption in our DID estimator is that the trend of an outcome variable is similar between our treatment group and the control group in the absence of RTAs. This common trend assumption can be applied to the following conditional expectation:

$$E[Y_{0ijkct}|j, k't, ct, k'c, \boldsymbol{X}_{it}, \boldsymbol{Z}_{kct}, \boldsymbol{D}_{kct}] = \lambda_j + \lambda_{k't} + \lambda_{ct} + \lambda_{k'c} + \boldsymbol{X}_{it} + \boldsymbol{Z}_{kct}, \tag{3}$$

where Y_{0ijkct} denotes the outcome variable in the pre-treatment period (i.e., the years before an RTA entered into force). This expectation indicates that affected sectors can differ from non-affected sectors only in the fixed effects and all the other controls.

To deal with this identification problem, we verify whether RTAs induce a deviation

[7]The NAFTA-inspired approach affects all modes of supply indifferently. This does not cause differences in restrictions on modes.

from the parallel trend by estimating the following equation:

$$Y_{ijkct} = \alpha + \sum_{l} \sum_{s=-6}^{6} \beta_{t+s}^{l} NegativeList_{kc}^{l} \times Year_{c,t+s} + \boldsymbol{X}_{it} + \boldsymbol{Z}_{kct} + \lambda_j + \lambda_{k't} + \lambda_{ct} + \lambda_{k'c} + \epsilon_{ijkct}, \quad (4)$$

where $Year_{c,t+s}$ is an indicator variable that takes one in year $t+s$, $s = -6, -5, \ldots, 6$, with t being the year in which an RTA between Japan and the host country c enters into force, and zero otherwise. If β_{t+s}^{l} is not significantly different from zero for $s = -6, -5, -4, -3, -2, -1$, there is no deviation from the parallel trend with respect to the treatment by $NegativeList_{kc}^{l}$.

3. Data

In the dataset of FDI in services, Japanese parent firms and their foreign affiliates in service sectors are matched from 1995–2018. The data on Japanese MNEs' outward FDI and the activities of foreign affiliates in services are from the Basic Survey on Overseas Business Activities (BSOBA), or *Kaigai Jigyo Katsudo Kihon Chosa*, conducted by the Ministry of Economy, Trade and Industry (METI). We utilize the information on the establishment date of a foreign affiliate to create the affiliate entry dummy. When the information on the establishment date is missing in the BSOBA data or the presence of a foreign affiliate cannot be verified by the BSOBA, we supplement the information using Toyo Keizai's Overseas Japanese Companies database. In the matched dataset, Japanese parent firm level data are obtained from the Basic Survey of Japanese Business Structure and Activities (BSJBSA), or *Kigyo Katsudo Kihon Chosa*, conducted by the METI. This survey includes information on parent firms' time-varying characteristics. Notably, this Japanese parent firm level data also provides firm-level trade in services.[8]

The data on Japanese RTAs are from the legal texts of the individual treaties. Specifically, we focus on five RTAs, namely, economic partnership agreements (EPAs) with a service chapter signed by Japan that include negative lists and entered into force by the end of 2018.[9] It is noteworthy that a total of 14 EPAs were signed by Japan

[8]Morikawa (2019), using panel data of the BSJBSA from 2009 to 2012, presents the characteristics of service traders compared to those of goods traders. However, the absence of affiliate-level services trade in this dataset makes it difficult to analyze the effects of PU on trade in services.

[9]Most of the RTAs signed by Japan are called EPAs. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) was signed on March 2018 and took effect on December 2018, and the EPA between European Union and Japan was signed on July 2018 and took effect on February 2019. Since our observation period is 1995–2018, these mega-regional trade agreements that are substantially in force from 2019 are outside the scope of this paper.

and entered into force by the end of 2018. However, nine of them include positive lists, which prevents us from adopting our empirical strategy. This is why we focus on five EPAs that include negative lists and entered into force by the end of 2018. Table 1 shows the list of the host countries with the year and month of signing the RTA and its entry into force.

(Insert Table 1 here.)

Table 2 presents the number of sectors listed in the current and future reservation of the five RTAs. It also shows that more sectors are listed as current reservation than future reservation; however, the distribution of sectors listed are similar for both reservations. The listed sectors include communication, transport, education, medical treatment, advertising, entertainment, and professional as well as personal services. For domestic reasons, for example, social and physical infrastructure protection, these sectors remain exempted from any commitments.

(Insert Table 2 here.)

Table 3 presents the number of sectors exempted from individual liberalization commitments in current and future reservations. It shows that more sectors are exempted from NT than other commitments in current and future reservations. The exemptions from NT and other commitments can be applied simultaneously, meaning that the government in a host country can give domestically owned firms an advantage over foreign affiliates. Such exemptions make it difficult for sensitive sectors to be harmed by the competition with foreign affiliates. We should note that the Japan-Mexico EPA and the Japan-Chile EPA, following NAFTA, exclude obligatory provisions on MA, but the other EPAs go beyond NAFTA and include it. The summary statistics of the main variables are reported in Table 4.

(Insert Table 3 here.)

(Insert Table 4 here.)

4. Empirical Results

4.1. Main results

Columns (1), (2), (3), and (4) in Table 5 report the DID estimation results using a full sample of the dataset. The table shows that the current MFN reservation negatively affects the dependent variables. It significantly reduces the probability of affiliate entry

in Column (1) and the probability of affiliate exit in Column (2). The current NT reservation also negatively affects the ownership ratio of parent firms in Column (4). In contrast to Inada and Jinji (2020), coefficients of capital investment are insignificant. This might mean that less capital investment is required in FDI in services than FDI in the manufacturing industries.[10] Most coefficients of the MA reservation are also insignificant. We check robustness using a selected sample of non-missing values of capital investment in Table 6. Columns (1), (2), and (3) in Table 6 are similar to the results for the full sample. The coefficients of the future MFN reservation, however, turn significantly.

Considering the magnitude of the effects in Columns (1) and (2) in Table 5, we find that, when a sector is included in the negative list for the current reservation of MFN, the probability of affiliate entry falls by 13.0% and that the probability of affiliate exit declines by 7.7%. These findings imply that a reduction in PU regarding the MFN status of foreign investors in the host country due to the entry into force of an RTA *increases* the probability of affiliate entry by 13.0% and the probability of affiliate exit by 7.7%. These magnitudes are consistent with — but larger than — the estimates in Table 5 of Inada and Jinji (2020). Subsequently, we consider the magnitude of the effects in Column (4) in Table 5 and find that, when a sector is included in the negative list for the current reservation of NT, the ownership ratio of parent firms falls by 19.4%. These results suggest that the PU regarding NT reduces effects on the intensive margin of FDI in services; in contrast, the PU regarding MFN reduces the extensive margin of FDI in services.

(Insert Table 5 and 6 here.)

4.2. Identification assumption and checks

We now examine whether the common trend assumption is valid for the three key variables: affiliate entry, affiliate exit, and ownership ratio by estimating Eq.(4). In panel A of Figure 4, we plot the set of estimated coefficients from the DID estimation of Eq.(4) for $MFN\_current_{kc} \times Year_{c,t+s}$, showing the differences in the affiliate entry dummy (left panel) and the affiliate exit dummy (right panel) between affected and unaffected sectors over time. The coefficients are estimated from the full sample in Table 5 because, unfortunately, estimated coefficients at the treatment year—$MFN\_current_{kc} \times Year_{c,t}$ is dropped from the results of the selected sample. In the pre-treatment period of Figure 4, the coefficients are insignificant. By contrast, in the post-treatment period, the

[10] According to the dataset used in Inada and Jinji (2020), the mean log of capital investment by foreign affiliates in manufacturing sectors is 3.378, which is substantially larger than that in service sectors shown in the Panel A of Table 4.

coefficients, though seemingly unclear, significantly decrease for both affiliate entry and exit. In the panel B of Figure 4, we plot the set of estimated coefficients from the DID estimation of Eq.(4) for $NT\_current_{kc} \times Year_{c,t+s}$, showing the differences in the ownership ratio of parent firms between affected and unaffected sectors over time. In the pre-treatment period of the panel, the coefficients are insignificant. In contrast, the coefficients tend to decline in ownership ratio in the post-treatment period. These findings indicate that the trends of the treatment and control groups are likely to be parallel in the pre-treatment period and gradually divergent in the post-treatment period, although this trend is more evident in the coefficients of ownership ratio than that of affiliate entry and exit.

(Insert Figure 4 here.)

4.3. Alternative timing of the treatment

Following Inada and Jinji (2020), we examine whether the baseline results change if we set the date of signing rather than the date of entry into force as the timing of the treatment. In Eq.(2), we replace $Post_{ct}$ by $Signed_{ct}$, which is an indicator variable that takes one for years after an RTA is signed, and zero otherwise. The estimated results using the timing of signing RTAs as $Signed_{ct}$ are reported in Tables 7 and 8. The results are qualitatively similar to those in Tables 5 and 6 but the coefficients on the current reservation of MFN turn insignificant in Columns (1) and (2) in Tables 7 and 8. The less significant results regarding the current reservation of MFN suggest that the change in PU is larger at the timing of RTA's entry into force than at the timing of signing it. This seems reasonable because the obligations in an RTA become valid only after the RTA enters into force. Thus, signing an RTA alone may not be enough to change PU significantly.

(Insert Table 7 and 8 here.)

5. Conclusions

To broaden our understanding of the role of RTAs in reducing PU on FDI in services, this study investigates how the specific approach to scheduling binding commitments, or reservations for non-conforming measures, in services chapters of RTAs affect FDI in services. We focus on the effect of PU regarding MA, NT, and MFN, which is measured by comparing the affected and non-affected sectors before and after the entry into force of RTAs in the DID design. Our DID estimates reveal that a reduction in PU regarding the current reservation of MFN increases the probability of affiliate entry and that a

reduction in PU regarding the current reservation of NT increases the ownership ratio of parent firms. Moreover, the results show that a reduction in PU regarding the current reservation of MFN increases rather than decreases the probability of affiliate exit. Since the new entry of firms is stimulated by the reduction in PU, the sector may become more competitive, resulting in a higher probability of exit of incumbent affiliates. A reduction in PU regarding the future MFN reservation also increases the probability of affiliate entry, though it became insignificant in the full sample. Taken together, these results demonstrate that the PU regarding NT reduces effects on the intensive margin of FDI in services; in contrast, the PU regarding MFN reduces the extensive margin of FDI in services.

An important policy implication of the present study's findings is that different reservations affect different aspects of FDI in host countries. Specifically, the PU of the domestic competitive environment with other foreign investors (i.e., regarding MFN), may be important to the extensive margin of FDI in services; meanwhile, the PU of the domestic competitive environment with domestic rivals (i.e., regarding NT) may be important to the intensive margin of FDI in services. Reducing such PU attracts more FDI, which makes it vital to sign an RTA with a well-designed approach to scheduling binding commitments.

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Table 1. RTAs with a service chapter (and negative lists) signed by Japan that include negative lists and entered into force by the end of 2018

Partner	Date signed	Date of entry into force
Mexico	September 2004	April 2005
Chile	March 2007	September 2007
Switzerland	February 2009	September 2009
Peru	May 2011	March 2012
Australia	July 2014	January 2015

Note: RTAs with a service chapter signed by Japan and partner countries that include negative lists and entered into force by the end of 2018 are listed.
Source: METI (2019, pp. 559–560).

Table 2. Number of service sectors listed in the current and future reservation of RTAs

	Current reservation	Future reservation	Total
Construction	2	1	3
Energy supply	1	1	2
Communication	12	9	21
Transport	8	5	13
Wholesale and retail trade	6	2	8
Financial and insurance	3	3	6
Real estate	2	0	2
Rental service	1	0	1
Education and Medical treatment	5	6	11
Other services	13	7	20
Total	53	34	87

Note: Sectors are classified by two-digit BSOBA (METI) sector codes.

Table 3. Number of service sectors exempted from individual liberalization commitments in the negative lists of RTAs

Panel A: Current reservation

	MA	NT	MFN	MA& NT	MA& MFN	NT& MFN	MA& NT& MFN
Construction	1	2	0	1	0	0	0
Energy supply	0	1	0	0	0	0	0
Communication	6	12	6	6	2	6	2
Transport	3	8	5	3	2	5	2
Wholesale and retail trade	2	6	0	2	0	0	0
Financial and insurance	3	3	0	3	0	0	0
Real estate	0	2	0	0	0	0	0
Rental service	1	1	1	1	1	1	1
Education and Medical treatment	2	5	0	2	0	0	0
Other services	3	13	5	3	3	5	3
Total	21	53	17	21	8	17	8

Panel B: Future reservation

	MA	NT	MFN	MA& NT	MA& MFN	NT& MFN	MA& NT& MFN
Construction	0	1	0	0	0	0	0
Energy supply	0	1	1	0	0	1	0
Communication	2	8	7	2	2	6	2
Transport	2	5	3	2	0	3	0
Wholesale and retail trade	2	0	0	0	0	0	0
Financial and insurance	2	3	1	2	1	1	1
Real estate	0	0	0	0	0	0	0
Rental service	0	0	0	0	0	0	0
Education and Medical treatment	1	6	5	1	1	5	1
Other services	2	6	7	2	2	6	2
Total	11	30	24	9	6	22	6

Note: Sectors are classified by two-digit BSOBA (METI) sector codes.

Table 4. Summary statistics

Panel A. Affiliate level variables
(selected sample with non-missing values of capital investment)

Variables	No. of obs.	Mean	Std. dev.	Min.	Max.
$\mathbb{1}_{entry>0}$	2,962	0.021	0.145	0	1
$\mathbb{1}_{exit>0}$	2,962	0.003	0.058	0	1
Log(invest)	2,962	2.180	2.261	0	10.415
Ownership ratio	2,928	0.834	0.321	0	1

Panel B. Affiliate level variables (full sample)

Variables	No. of obs.	Mean	Std. dev.	Min.	Max.
$\mathbb{1}_{entry>0}$	3,152	0.021	0.144	0	1
$\mathbb{1}_{exit>0}$	3,152	0.003	0.056	0	1
Ownership ratio	3,116	0.827	0.326	0	1

Notes: The observation period covers 1995–2018. This table reports the number of observations, means, and standard deviations for the following variables: affiliate entry dummy, affiliate exit dummy, log of capital investment, and ownership ratio.

Table 5. Main results: full sample

Dep. var.	(1) $\mathbb{1}_{entry>0}$	(2) $\mathbb{1}_{exit>0}$	(3) Log(invest)	(4) Ownership ratio
MA_current × Post	−0.156	−0.161	1.054	0.074
	(0.102)	(0.094)	(0.647)	(0.111)
NT_current × Post	0.033	0.032**	0.747	−0.194**
	(0.029)	(0.010)	(0.418)	(0.057)
MFN_current × Post	−0.130*	−0.077**	−0.670	0.155
	(0.053)	(0.024)	(0.320)	(0.079)
MA_future × Post	0.080	−0.032	−0.692	0.059
	(0.067)	(0.042)	(1.313)	(0.068)
NT_future × Post	0.018	0.010	−1.718	−0.089
	(0.131)	(0.019)	(2.491)	(0.066)
MFN_future × Post	−0.410	−0.135	2.783	0.545**
	(0.202)	(0.085)	(3.665)	(0.120)
LP_current × Post	Yes	Yes	Yes	Yes
LP_future × Post	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Sector × Year FEs	Yes	Yes	Yes	Yes
Country × Year FEs	Yes	Yes	Yes	Yes
Country × Sector FEs	Yes	Yes	Yes	Yes
Sector-level controls	Yes	Yes	Yes	Yes
Affiliate-level controls	Yes	Yes	Yes	Yes
R^2	0.139	−0.015	0.472	0.901
No. of obs.	3,152	3,152	2,962	3,116

Notes: ** and * denote significance at the 1% and 5% levels, respectively. Standard errors clustered by sector are in parentheses. Estimations include time-varying controls at the affiliate level, sector-year, country-year, and country-sector fixed effects, as well as the host economy's sector GDP and the number of workers.

Table 6. Main results: selected sample

Dep. var.	(1) $\mathbb{1}_{entry>0}$	(2) $\mathbb{1}_{exit>0}$	(3) Ownership ratio
MA_current × Post	−0.037	−0.179	0.141
	(0.035)	(0.103)	(0.087)
NT_current × Post	0.002	0.039**	−0.224**
	(0.025)	(0.012)	(0.071)
MFN_current × Post	−0.130*	−0.080**	0.147
	(0.052)	(0.027)	(0.076)
MA_future × Post	0.047	−0.028	0.045
	(0.056)	(0.044)	(0.081)
NT_future × Post	0.132	-0.006	−0.000
	(0.071)	(0.016)	(0.105)
MFN_future × Post	−1.323**	−0.025	0.014
	(0.123)	(0.044)	(0.169)
LP_current × Post	Yes	Yes	Yes
LP_future × Post	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Sector × Year FEs	Yes	Yes	Yes
Country × Year FEs	Yes	Yes	Yes
Country × Sector FEs	Yes	Yes	Yes
Sector-level controls	Yes	Yes	Yes
Affiliate-level controls	Yes	Yes	Yes
R^2	0.156	−0.020	0.897
No. of obs.	2,962	2,962	2,928

Notes: ** and * denote significance at the 1% and 5% levels, respectively. Standard errors clustered by sector are in parentheses. Estimations include time-varying controls at the affiliate level, sector-year, country-year, and country-sector fixed effects, as well as the host economy's sector GDP and the number of workers.

Table 7. Treatment by signing: full sample

Dep. var.	(1) $\mathbb{1}_{entry>0}$	(2) $\mathbb{1}_{exit>0}$	(3) Log(invest)	(4) Ownership ratio
MA_current × Signed	−0.178	−0.100	1.888*	0.034
	(0.100)	(0.050)	(0.851)	(0.104)
NT_current × Signed	0.040	0.020**	0.532	−0.186**
	(0.027)	(0.006)	(0.432)	(0.058)
MFN_current × Signed	−0.110	−0.071	−0.206	0.141
	(0.054)	(0.041)	(0.421)	(0.085)
MA_future × Signed	0.081	−0.014	−0.659	0.053
	(0.061)	(0.065)	(1.357)	(0.056)
NT_future × Signed	0.043	0.006	−1.359	−0.083
	(0.148)	(0.016)	(2.604)	(0.062)
MFN_future × Signed	−0.429	−0.088	2.517	0.501**
	(0.233)	(0.055)	(3.834)	(0.115)
LP_current × Signed	Yes	Yes	Yes	Yes
LP_future × Signed	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Sector × Year FEs	Yes	Yes	Yes	Yes
Country × Year FEs	Yes	Yes	Yes	Yes
Country × Sector FEs	Yes	Yes	Yes	Yes
Sector-level controls	Yes	Yes	Yes	Yes
Affiliate-level controls	Yes	Yes	Yes	Yes
R^2	0.139	−0.018	0.472	0.901
No. of obs.	3,152	3,152	2,962	3,116

Notes: ** and * denote significance at the 1% and 5% levels, respectively. Standard errors clustered by sector are in parentheses. Estimations include time-varying controls at the affiliate level, sector-year, country-year, and country-sector fixed effects, as well as the host economy's sector GDP and the number of workers.

Table 8. Treatment by signing: selected sample

Dep. var.	(1) $\mathbb{1}_{entry>0}$	(2) $\mathbb{1}_{exit>0}$	(3) Ownership ratio
MA_current × Signed	-0.052^{*}	-0.112	0.099
	(0.023)	(0.058)	(0.096)
NT_current × Signed	0.006	0.025^{**}	-0.216^{**}
	(0.024)	(0.008)	(0.073)
MFN_current × Signed	-0.103	-0.071	0.126
	(0.058)	(0.042)	(0.075)
MA_future × Signed	0.036	-0.012	0.035
	(0.049)	(0.069)	(0.063)
NT_future × Signed	0.188	-0.004	-0.003
	(0.092)	(0.025)	(0.093)
MFN_future × Signed	-1.384^{**}	-0.019	0.001
	(0.233)	(0.062)	(0.145)
LP_current × Signed	Yes	Yes	Yes
LP_future × Signed	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Sector × Year FEs	Yes	Yes	Yes
Country × Year FEs	Yes	Yes	Yes
Country × Sector FEs	Yes	Yes	Yes
Sector-level controls	Yes	Yes	Yes
Affiliate-level controls	Yes	Yes	Yes
R^2	0.139	-0.018	0.901
No. of obs.	2,962	2,962	2,928

Notes: ** and * denote significance at the 1% and 5% levels, respectively. Standard errors clustered by sector are in parentheses. Estimations include time-varying controls at the affiliate level, sector-year, country-year, and country-sector fixed effects, as well as the host economy's sector GDP and the number of workers.

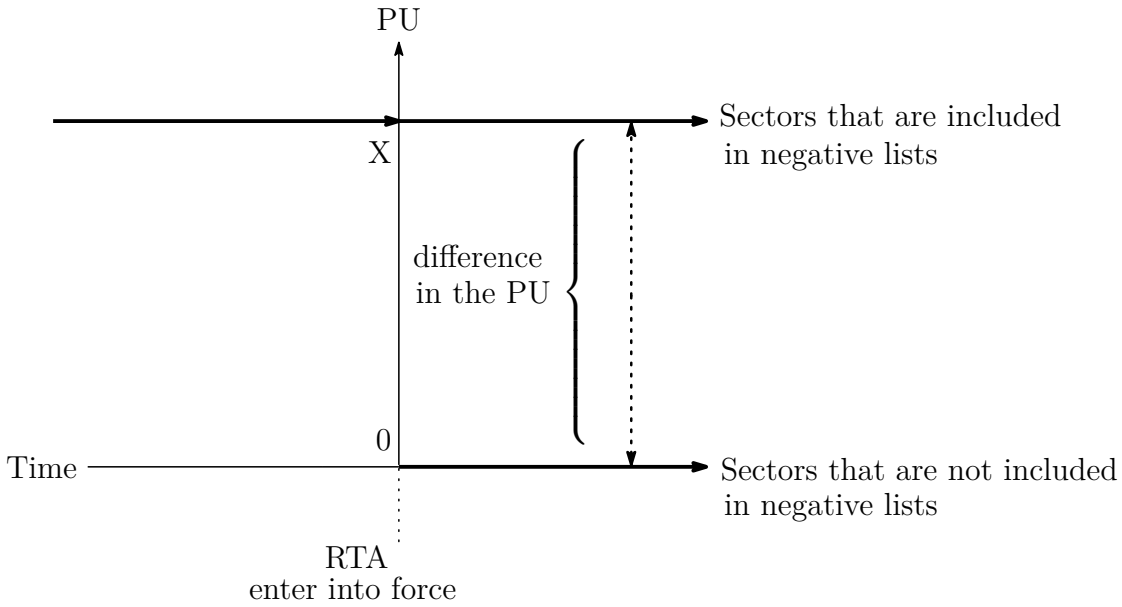

Figure 1. Sectoral differences in the PU degree before and after an RTA enters into force

Note: The upper bold arrow denotes the degree of PU in the case the degree of PU for the sectors included in negative lists remain the same before and after an RTA enters into force, and a lower one denotes the elimination of PU in the sectors that are not included in negative lists after the RTA enters into force.

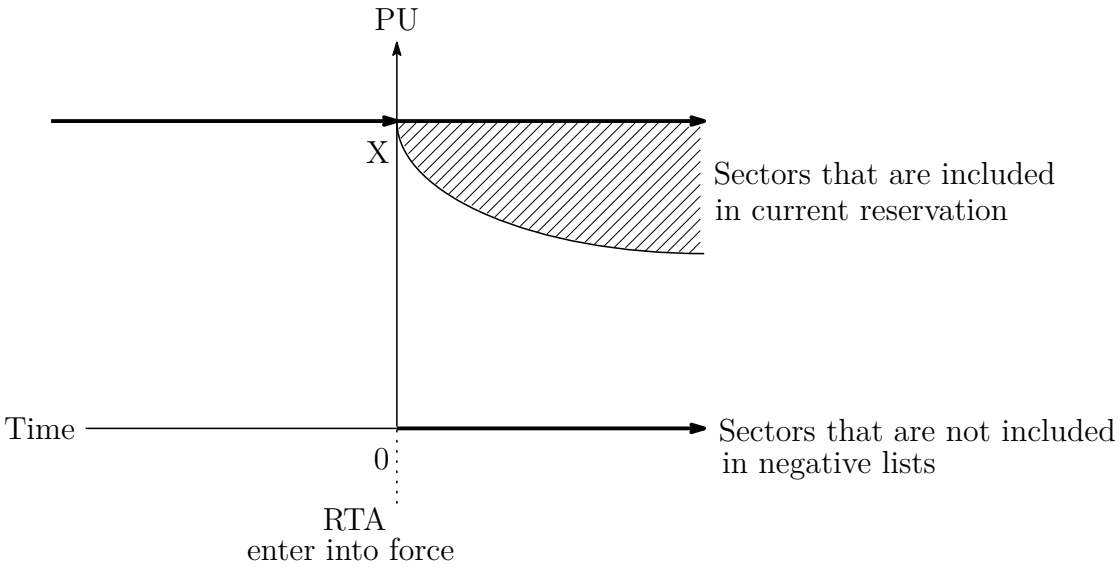

Figure 2. Sectoral differences in the PU degree when affected sectors include in the current reservation in an RTA

Note: The upper area shows the degree of PU for the sectors included in the current reservation experiencing no change or a decrease after an RTA enters into force. A lower bold arrow denotes the elimination of PU in the sectors that are not included in negative lists after the RTA enters into force.

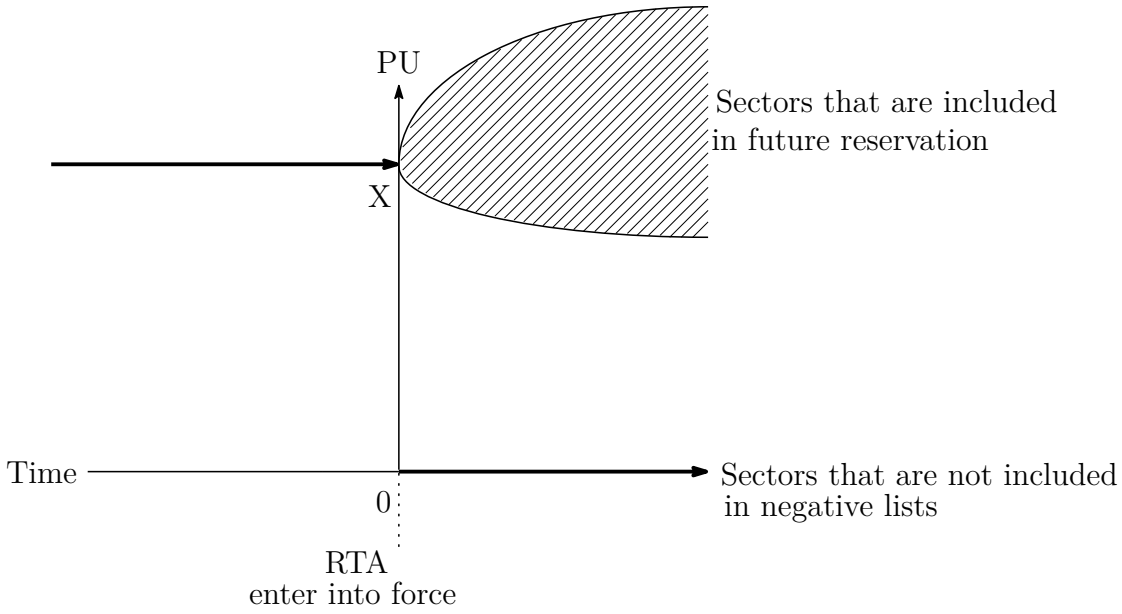

Figure 3. Sectoral differences in the PU degree when affected sectors include in the future reservation in an RTA

Note: An upper area shows the degree of PU for the sectors included in the future reservation experiences any change or even an increase after an RTA enters into force. A lower bold arrow denotes the elimination of PU in the sectors that are not included in negative lists after the RTA enters into force.

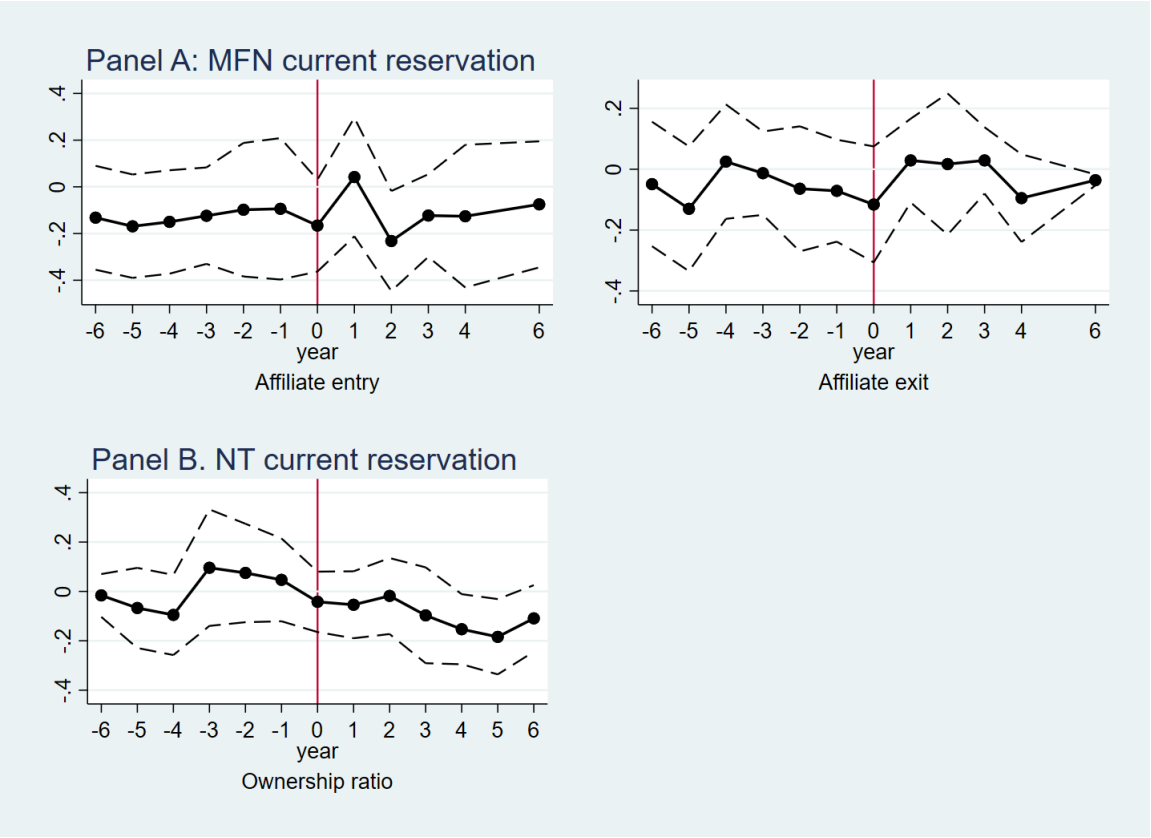

Figure 4. Estimated coefficients of the interactions between affected and unaffected sectors

Note: The solid line is the trend of affiliate entry, exit, and ownership ratio difference between the sectors included in the current reservation (treatment group) and the sectors that are not included in negative lists (control group) before and after an RTA enters into force for specification (1) and (2) in Table 5 (Panel A) and specification (4) in Table 5 (Panel B). The dashed lines represent the 95% confidence intervals of the estimated effects.