



# Sister cities, cross-national FDI, and the subnational FDI location decision

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## Abstract

We investigate how intergovernmental ties at subnational levels between home and host countries influence the intensity and location of foreign direct investment (FDI) inflows. We focus on an intriguing type of subnational tie, namely, International Friendship (Sister) Cities. A sister city is a decentralized form of intergovernmental relationship that provides a platform by which a multinational corporation (MNC) can approach a local government, customers, and clients to acquire localized information and political capabilities. We argue that cities with a sister-city relationship attract more FDIs than other similar cities within a host country. The benefit extends to the national level as MNCs have higher FDI levels in host countries with a greater number of sister cities with their home country. We further investigate whether the effect of sister cities on an MNC's country selection is greater when host-country subnational governments have a higher degree of autonomy relative to the national government, and lesser when governments have a higher level of policy uncertainty. Using data from the 1990–2009 period, we find consistent support for our ideas as tested at two levels of analysis: a city-level matched sample analysis on Japanese FDI inflows, and a country-level analysis on Japanese MNCs' country selection.

*Journal of International Business Studies* (2021).

<https://doi.org/10.1057/s41267-021-00409-2>

**Keywords:** intergovernmental ties; decentralization; subnational location choice; sister cities; country selection

## INTRODUCTION

Multinational corporations (MNCs) face uncertainty from the political environment when undertaking foreign direct investments (FDIs), which create risks related to unpredicted or discriminatory policy changes, bribery and corruption, or even governmental expropriation of returns or assets (Brewer, 1993; Fitzpatrick, 1983; Rodriguez et al., 2005). When making an FDI, MNCs can use official bilateral arrangements as an instrument to reduce the uncertainty that arises from host-country governments. Intergovernmental ties, interstate collaboration, and cooperative bilateral relations facilitate FDIs by creating credible governmental commitments, while enhancing mutual trust and coordination between countries, and between business and government



(Desbordes, 2010; Hu & Lu, 2014; Li & Vashchilko, 2010; Li et al., 2018; Neumayer & Spess, 2005).

As such, research has understandably focused on intergovernmental ties and bilateral ties between home- and host-country national governments, but with considerably less exposure given to decentralized relationships struck at local government levels. Although bilateral arrangements send a positive signal to international investors, their influences on the FDI decision can be muted when a host country has considerable subnational variance in its institutional environment. Local governments can leverage their decentralized position of authority to attract FDI (He & Sun, 2014; Qian & Weingast, 1997), which makes subnational regions and their institutions critical considerations for a foreign entry strategy (Chan et al., 2010; Ma et al., 2013; Yao & Zhang, 2015). Thus, it is instructive to identify whether and how connections between the subnational governments of two countries, which have their own decentralized policy and administrative measures, can shape local business conditions to affect FDI, and correspondingly, the investment strategy of MNCs.

National governments create a framework of bilateral trade and investments by formulating laws, policies, and diplomatic relations. Subnational governments provide MNCs with public services such as infrastructure, employment, and local taxation (Arregle et al., 2013; Du et al., 2008). When subnational governments have the discretion to make policy separate from national regulations (Zhou et al., 2002), they can be key players in FDI decisions. Stated more succinctly, subnational governments with their specialized local information and public resources are important to MNCs and their FDI decisions. That said, there is still substantial opportunity for research to explore the question “How do subnational intergovernmental ties affect the subnational investment environment and connect to an MNC’s FDI strategy?”

Our focus for the examination of this question is International Friendship Cities, widely referred to as “sister cities”. A sister-city relationship is a formal tie between the subnational governments of two countries. Sister cities link two subnational governments, improving communications and providing the local communities of each city with a broad-based, long-term partnership that enables a cross-border exchange of cultural and economic opportunities, and encourages social events between officials, civilian organizations, and people (Cremer et al., 2001; Ramasamy & Cremer, 1998; Zelinsky,

1991). Sister cities were first formed post-World War II between German and French cities to help each other rebuild societies, and later between cities of the United States and Europe to promote the European economy. This official subnational relationship spread widely to other parts of the world in the next decades, with positive impacts on global economies, tourism, and exchanges (SCI, 2015).

Although these benefits are widely purported to accompany sister cities, we aim to deepen theoretical and empirical understanding of the relationships between sister cities and FDI. We initiate our conceptual discussion by developing an understanding of how decentralization in a government administration can lead to an improved provision in information flows and consequent efficiencies in economic decisions (Hayek, 1945; Oates, 1999; Tiebout, 1956). We leverage these ideas on decentralization to develop theory on how sister cities facilitate interactions between MNCs and local authorities in host countries, while allowing MNCs to channel support from their home-country subnational governments.

We test our hypotheses with a 20-year panel of Japanese FDI worldwide. Notably, we conduct empirical analyses at both the city and country levels. Moreover, we implement two commonly used matching techniques, coarsened exact matching (CEM) and propensity score matching (PSM), to provide better causal evidence. Finally, we conduct interaction analysis to provide better insight into how the importance of sister cities is dependent on specific characteristics of national institutional environments.

Succinctly, we investigate intergovernmental ties at subnational levels in the form of sister cities to demonstrate their role in facilitating FDI inflows to subnational regions, alongside their impact on MNCs’ country selection. Positioned in this manner, our research generates new knowledge on business–government relationships at subnational levels (Chan et al., 2010; Yao & Zhang, 2015; Zhong et al., 2019), while providing MNCs with insights into how to enhance information and reduce uncertainty when making FDI decisions at national and subnational levels.



## BACKGROUND

### Subnational Governments and FDI

FDI in a host country is governed by jurisdictions at a number of levels, most readily divided as a national government versus the subnational government(s) (Olson, 1969; Ring et al., 2005a, b). The subnational level has a number of granular distinctions: state (province, prefecture), county or city. A national government is referred to as a central government, which aligns with the idea that it provides a centralized form of regulation and administration for core aspects of an economy such as currency, price supports, and FDI policies. Meanwhile, subnational governments often take the lead in formulating localized policies regarding employment, sourcing, taxes, and infrastructure (Chan et al., 2010; Ma et al., 2013).

This depiction of the distribution of authority in a government connects to a fundamental tenet in economics concerning the value or efficiency that is found in decentralization (Hayek, 1945; Marschak, 1959; Tiebout, 1956). As explained in Hayek (1945), decentralized administrative units possess advantages in terms of the acuity of information gathering, and in the discernment of specialized and localized information. This acuity contrasts with the information found in centralization administrative units, which is more general in form and can poorly reflect the particulars of unique, localized situations. Hence, decentralization can enhance the speed of decision-making, where decisions are not only timely but also aligned with the local context. Although these ideas cover broad ground in terms of economic organization and the efficient use of knowledge and information, they also form the theoretical foundation for our arguments about the relative advantages that subnational governments can have over a national government in the context of FDI decisions.

First, decentralization creates an informational advantage in the FDI decision process. A national government lacks the information acuity to process FDI decisions dispersed in space, time, and place. Subnational governments, however, have specific knowledge on local conditions that connect to the economic challenges in their location, which helps align local affairs and interests with proposed economic initiatives. Moreover, a national government is challenged to attend to preference and cost heterogeneity across subnational regions (Olson, 1969). Subnational governments, however, can

attend to specific problems in local exchange and deal with FDI on a case-by-case basis, which enables public goods to be tailored in a more efficient way than when provided at the national level.

Second, decentralization can lead to competition between subnational governments (Cai & Treisman, 2005), which in turn brings vitality to local economies. Competition compels subnational governments to create business-friendly environments and preferential policies to attract investments (Qian & Weingast, 1997; Xu et al., 2014). Compared to a centralized administration, fiscal decentralization leads to better local economic performance and a greater FDI inflow to developing countries (He & Sun, 2014; Kessing et al., 2014; Qian & Roland, 1998). As an example, Special Economic Zones (SEZs) in China have a high degree of autonomy and authority in tax, public expenditure, and other policies, and have been successful in attracting FDI (Wang, 2013; Zhou et al., 2002).

Third, decentralized authorities are strongly connected to the welfare of local communities and seek stable relationships with the business community to preserve local interests (Cantwell et al., 2010; Dunning, 1998; Kozhikode & Li, 2012). Compared to a central government, subnational governments are less concerned with cross-border sentiments, bilateral relations, and international politics, as conflated by ideological distinctions between home and host countries (Kim & Chung, 1997; Klein et al., 1998). As such, foreign firms are able to establish a solid business–government relationship at the local level (Holburn & Zelner, 2010; Luo, 2001; Luo et al., 2002).

### Sister Cities as a Form of Decentralization

International Friendship Cities, or sister cities, are a prevalent form of subnational intergovernmental ties established between the administration of two cities (or provinces, prefectures, counties) of two countries. The relationship is official and formal. It is usually anchored by an agreement or memorandum underwritten by mayors and government leaders. Typically, this twinning relationship neither specifies duration or termination nor poses any compulsory responsibilities on either city (Cremer et al., 2001). It is an expression of friendship and goodwill between two communities, aiming for long-term social interaction and exchange. Unlike SEZs that are granted special authority to formulate local economic or political policies, sister cities involve no change in formal authority delegation (Aghion & Tirole, 1997). Yet, sister cities are



decentralized intergovernmental relationships that facilitate information exchange between government, business, and people. They allow local policymakers to develop relationships and economic exchanges that are pertinent to the local community. It lends legitimacy to sister-city government officials in their discussions with potential foreign investors.

These points are reflected in the various forms of interactions found in sister cities, including mutual visits of governmental officials and politicians, and in-person meetings and gatherings by theatrical and athletic groups, businesspeople, professionals, and hobbyists (Baycan-Levent et al., 2008; Zelinsky, 1991). The sister-city relationship creates a decentralized mechanism for the cross-national sharing of technical expertise, information, and equipment between private and public sectors. Moreover, a developed city can provide various types of economic and technological assistance to a less-developed city.

The antecedents of sister cities go back to the 19th century when cities in Europe and North America established connections for spontaneous reasons such as cultural exchanges in world fairs and philanthropic aids in disaster and geographic catastrophes. The modern form of sister cities to which we refer in this study, germinated in the aftermath of World War II when cities in Germany, France, and other European countries, formed official relationships to facilitate rehabilitation and rebound from their war wounds (Zelinsky, 1991). Sister cities soon spread from Europe to North America, Asia, and other parts of the world. They became a social movement when the U.S. President Dwight Eisenhower initiated a people-to-people program with European countries in 1956, with an intention to unite Europe and resist the influence of the Soviet Union (Cremer et al., 2001). Later, the motivation of twinning became less ideology-driven, with more of an economic objective, which deepened historical ties and cultural affinities.

In the 1980s, many developing countries formed sister cities with developed countries for the purpose of inviting capital and investments to promote the local economy (Ramasamy & Cremer, 1998). Many European cities twinned as sister cities in the 1990s, given they wanted economic exchanges and shared similar urban challenges (Baycan-Levent et al., 2010). There were also cities that looked for a reunion across history and geography. Quanzhou (China) twinned with Nagasaki

(Japan) in 1980. The two cities had been trading with each other for over 1000 years, until World War II stopped this relationship. There are also twinning cases for idiosyncratic reasons such as Hastings (New Zealand) and Guilin (China), which tied as sister cities in 1981 because a New Zealand scientist established personal links and networks between two cities during his scientific trips to Guilin (Cremer et al., 2001). Since the 1980s, sister cities have become a global phenomenon. The U.S., for example, had formed 1420 sister-city relationships by 1989. By 2014, 12,000 cities in the world were linked in sister-city relationships, forming 16,000 dyadic ties (SCI, 2015).

International communities consider sister cities as a route to economic benefits. For example, it has been reported that the twinning relationship between Seattle and Kobe stimulated a 300% increase in bilateral trade between the two cities, from \$8.3 million in 1957 to \$27.3 million in 1967 (SCI, 2015). Sister City International estimates that sister-city activities such as international exchanges, events, and volunteering created an economic impact on the U.S. economy of \$525.7 million and \$18.5 billion in the global economy in 2014 (SCI, 2015). German sister cities have a higher population growth through labor force exchange and firm relocation (Brakman et al., 2016).

Benefits notwithstanding, sister cities also come with a cost. First, sister cities as an official relationship need public resources that can pose budget pressures on subnational governments. Second, the time required to cultivate a sister-city relationship can be extensive, sometimes 10 years or more (Ramasamy & Cremer, 1998), which de-motivates policymakers who have short administrative time horizons. Third, sister cities are not for all: clearly large and famous cities like Beijing and Los Angeles appeal to many, but small or remote cities lack resources to attract potential partner cities.

As an intergovernmental relationship, sister cities can work as a form of folk diplomacy that supplements national-level diplomacy (Wallace & Weiss, 2015; Zelinsky, 1991). Most countries with elected subnational governments and decentralized political systems grant their cities full discretion to twin with international cities. Even in a politically centralized country such as China, cities can choose partners and initiate the establishment of sister-city relationships, but the relationship needs final approval from the central government. Although cases are rare, there are cities that terminate the relationship, mostly, for the fluctuations



in interstate relations. For example, Nanjing (China) announced in 2012 the termination of its sister-city relationship with Nagoya (Japan) because the mayor of the latter denied that the Japanese army perpetuated the Nanking (Nanjing) Massacre in World War II. In 2019, Prague (Czech Republic) cut its sister-city relationships with Beijing and Shanghai to establish a new one with Taipei.

## THEORY AND HYPOTHESES

### The Value of Sister Cities

A sister city is a decentralized form of intergovernmental relationship that can provide value to the business community and the local economy, especially when it can attract new foreign investment. The establishment of a sister-city relationship creates an opportunity for a local government to use its knowledge and resources to cater to specific issues that arise when negotiating and cooperating with MNCs (Hayek, 1945; Olson, 1969). As such, a sister-city relationship creates an opportunity for an efficient coordination between government and business.

Moreover, a sister city represents a decentralization in practiced authority, which does not lead to amendments in the ordering of formal authority structures (Aghion & Tirole, 1997; Ring et al., 2005a, b). As such, their formation will encounter little resistance from the national government as it involves little reallocation in resources (Rodden, 2002). This decentralization in practiced authority allows a sister city to use its resources to cater to specific problems that arise when negotiating with MNCs (Hayek, 1945; Tiebout, 1956). Relatedly, the establishment of a sister-city relationship requires fewer resources as compared to other economic initiatives such as tax reductions or governmental subsidies and thus is affordable to local governments (Zhou et al., 2002).

Next, MNCs attach value to a sister-city relationship as it facilitates FDI decisions in three ways. First, sister cities grant MNCs access to subnational governments such that they can acquire first-hand knowledge on the local economy and its investment environment (Cremer et al., 2001; Zelinsky, 1991), and align their investment strategy accordingly (Ma et al., 2013). With local authorities supervising the affairs of sister cities, this coordination facilitates a match between local needs and MNCs' competitive advantages. Cities in China,

India, and some Eastern European countries often hold investment fairs and seminars in their sister cities abroad. As an example, Aquars Inc., a Japanese environmental technology firm that first entered Shanghai when investing in China, found a good business opportunity in Dalian, a sister city of its hometown, Kitakyushu (BJX, 2014). The firm managers approached the Dalian government at a sister-city event, where the city was seeking capable contractors who had advanced technology. The two parties then concluded a large contract for a public project for contaminated soil remediation.

Furthermore, decentralization in a government also creates opportunities for MNCs to establish localized political capabilities (Kozhikode & Li, 2012; Luo et al., 2002). Sister cities reflect the goodwill of a local government and their positive attitude towards home-country investments, so that MNCs can expect a stable government relationship. A Japanese expatriate manager of a Hitachi subsidiary located in Tianjin (China) told the authors of this study about how they reached out to enquire about the government's attitudes towards Japanese firms. This occurred in 2012, when Japan and China had fresh disputes over some unsettled issues of history and territory, with new anti-Japan protests in more than 20 Chinese cities (Bradsher et al., 2012):

Our contact, who is a governmental official, told us that the local government will continue to support us, although they are under certain pressures from the public... And he emphasized that the local government attached great value to our cooperation because we are from Kobe, a sister city of Tianjin. The two cities have a 30-year friendship...

Second, sister cities can connect MNCs to non-governmental stakeholders in the local community. Sister cities facilitate people-to-people exchanges through various cultural and social events (Ramasamy & Cremer, 1998). MNCs from both countries often sponsor sister-city programs, which is mutually beneficial because the governments need firms to share financing and managerial resources, whereas MNCs seek for an opportunity to represent themselves to local clients and customers. A direct exposure to the public in a sister-city event brings to MNCs both public attention and an official endorsement from both governments, where they signal to the audience that they are a leading firm. As such, sister cities provide a platform for MNCs to gain legitimacy and

credibility in the host country (Pfeffer & Salancik, 2003).

Third, sister cities provide an opportunity for MNCs to engage subnational governments of their home country to help establish direct connections with foreign partners and gain business opportunities. Although many home-country governments support outward FDI, support often has limitations. First, a national government can only provide a supportive environment or policies at macro-levels, such as bilateral treaties and security alliances and common membership in intergovernmental organizations (Ingram et al., 2005; Li & Vashchilko, 2010; Neumayer & Spess, 2005). Such centralized coordination cannot consider conditions unique to subnational regions and thus fails to provide flexible support to firms (Olson, 1969). Second, some subnational governments provide financial support and information services to facilitate outward FDI (Lu et al., 2014; Luo et al., 2010), but such support is one-sided. It does not involve the home government connecting directly to the host-country government to provide information as connected to the FDI strategy (Filippetti & Sacchi, 2016; Zhang et al., 2020). However, MNCs benefit from contextualized assistance in endorsements and network establishment with local governments and business partners. The participation of home-country government in the bargaining process of FDI can provide substantial support for FDI decisions (Ramamurti, 2001).

Sister cities overcome such limitations as they provide tailored support for firms to establish local networks and gain business. Returning to our core theme, decentralization in organization improves flexibility and response for the simple yet powerful reason that subnational governments can establish direct connections with one another and in turn connect MNCs to foreign partners. Take the case of the harbor cities of Qingdao (China) and Puerto Mott (Chile), which twinned as sister cities and routinely held mutual official visits. The visiting groups were led by mayors and accompanied by local firm managers. Under the endorsements of their respective government and via these networks, several fishery firms of both cities formed interfirm alliances and cooperated in technology and marketing (QFAO, 2018).

### **Hypothesis 1: Sister Cities as a City-Level Attraction**

Sister cities provide several types of value to MNCs by connecting them to multiple parties: firms,

subnational governments of the host country and the home country, and other non-governmental stakeholders. Consequently, cities with sister-city relationships provide decentralized and highly contextualized information that increases the ease of doing business, which sends a strong signal of a friendly business environment and of foreigner-friendly institutions. We hence propose that MNCs prefer to invest in sister cities when they choose amongst subnational locations.

**Hypothesis 1** (city selection): Within a host country, cities with a sister-city relationship with a city from the home country can attract more FDIs from that home country than the cities that do not have a sister-city relationship.

### **Hypothesis 2: Sister Cities as a Country-Level Attraction**

The impact of sister cities on FDI at the city level creates two forms of spillovers that grow to be an influence at the country level. The first one is an imitation of forming sister-city relationships by other cities. Local governments are known to imitate other local governments such as for fiscal expenditures and the provision of public goods (Di Porto et al., 2017; Ravallion, 1982; Timmins, 2005). When a sister-city relationship is connected to FDI inflows, it can lead to the imitation of this institutional arrangement (Bosker & Garretsen, 2009). In the early history of sister cities, twinning relationships were established between cities in the then West Germany and France before spreading to other countries in Western Europe in the 1950s (Zelinsky, 1991). The national government of Japan has a special organization, called the “Council for Local Authorities”, which provides a market-like platform for Japanese cities to seek sister cities elsewhere in the world. China’s Ministry of Foreign Affairs is engaged in twinning Chinese cities with international cities. Sister cities thus spill over through observation and by direct promotion by national governments.

The other form of spillover effect is across MNCs for their country selection. A greater presence of sister cities in a host country sends a strong signal to the world that marks the host country as having a positive attitude of the government toward foreigners and their economic activity, which is interpreted as an FDI-friendly environment (Henisz, 2000a, 2000b; Rangan & Sengul, 2009). When MNCs first enter sister cities by FDI and build their network of public relationships and



connections to suppliers and customers, other firms that observe it will mimic their entry strategy (Henisz & Delios, 2001). Even though other cities in the host country have not yet established sister cities, MNCs could choose to invest in those cities. Thus, the positive impact of sister-city arrangements aggregates to a national attribute that MNCs will consider in their country selection for FDIs.

**Hypothesis 2** (country selection): The greater the number of sister-city relationships between a home country and a host country, the more likely an MNC from the home country will undertake FDI in that host country.

### Hypothesis 3: The Autonomy of Subnational Governments

Subnational governments oversee sister-city affairs. As such, a sister-city relationship plausibly provides MNCs with more value when subnational governments have a high level of local autonomy. Localized autonomy is usually found in a government system with a high degree of fiscal decentralization (Qian & Weingast, 1997; Rodden, 2002).

When a subnational government has control over public projects and related budgets, they have more discretionary resources to favor MNCs with fiscal or other incentives (Oates, 1999; Qian & Roland, 1998). Subnational governments entitled with a greater degree of discretion in public affairs are capable of creating a stable local environment (Jia & Mayer, 2017; Ring et al., 2005a, b). Even if a national government is unfavorable to MNCs, subnational governments with autonomy can moderate discriminatory policies from national level biases (Dunning, 1998; Luo, 2001; Luo et al., 2002) and provide a local buffer zone (Hu & Lu, 2014). Further, a decentralization of public authority grants local politicians a high level of responsibility, motivating them to respond to the needs of their local community (Enikolopov & Zhuravskaya, 2007; Olson, 1969). When MNCs can fulfill these needs such as via employment growth, they can influence local politicians with the potential benefits they bring to local politicians regarding re-election, for example, and hence acquire more information or be treated favorably in local policymaking.

**Hypothesis 3** (local autonomy moderates country selection): The positive effect of sister-city relationships on the likelihood of an MNC's FDI will be greater, the greater the level of a subnational government's autonomy relative to the national government.

### Hypothesis 4: Political Constraints on National Governments

The ability of political actors to act capriciously and not credibly commit to policy or a course of action connects to political constraints (Henisz, 2000a, 2000b). This concept is also connected to MNCs and sister cities. When an MNC becomes an actor in a local economy, it can have rivalrous and contentious relationships with interest groups such as state-owned firms, local private firms, labor unions, and environmental advocates (Dacin et al., 2007; Henisz, 2004; Kostova & Zaheer, 1999). When tensions arise, a host-country government under a low level of political constraints can rapidly revise priorities and policies to focus on domestic interests at the expense of serving MNCs' interests.

In this scenario, government policy inducements at the national level, or even at the local level as associated with sister cities, could become a less credible commitment. MNCs would likewise potentially face increased difficulty in communications with officials and disturbances in their cooperation with local governments (Henisz et al., 2005; Yao & Zhang, 2015). In the worst case, a government can renege on promised preferential conditions, incentives, and contracts for political reasons because of administrative turnover or to satisfy the individual interests of government officials (Allee & Peinhardt, 2011; Rodriguez et al., 2005; Zhong et al., 2019). Consequently, MNCs will reduce their expectations concerning the consistency and durability of governmental policy and, in turn, downplay the use of sister cities in country selection.

**Hypothesis 4** (political constraints moderate country selection): The positive effect of sister-city relationships on the likelihood of an MNC's FDI will be lesser, the lower the level of political constraints on governments in the host country.

## METHODS

### Data

We test our hypotheses with data on Japan's sister cities in 58 foreign countries using Japanese greenfield FDIs across the world. Japan has actively established international sister-relationships since the 1950s, with individual cities in Japan having considerable autonomy to freely decide on the affairs of sister cities and provide support to facilitate sister-city twinning. The consequent growth in sister-city relationships is shown in Figure 1 and

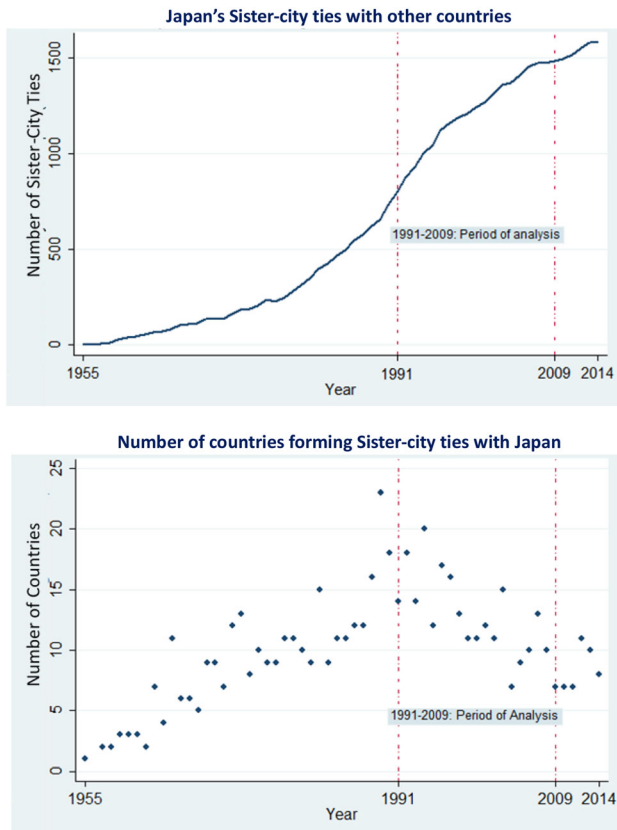


Figure 1 Japan's sister-city relationships with other countries.

the wide country spread can be seen in Table 1. Meanwhile, Japan has been one of the largest FDI sources in the world since the 1970s (UNCTAD, 2019). As a tradition, Japanese firms attach great value to networks and their relationships with local clients, customers, and other stakeholders (Lincoln & Gerlach, 2004). Our empirical setting thus provides a suitable context for studying sister cities and FDIs.

We constructed our samples using information from three main sources. First, we accessed firm-level data on Japanese MNCs from the Nikkei Economic Electronic Databank System (NEEDS). Second, we obtained FDI data (Japanese MNCs' foreign subsidiaries) from Japanese Overseas Investments (Delios & Henisz, 2003a, 2003b). Third, we obtained data on Japan's sister cities from the Council for Local Authorities for International Relations (CLAIR, 2015), a Japanese governmental organization that promotes sister cities between Japanese cities and international cities. We obtained other country data from various sources, including the Political Constraints Index (Henisz, 2002), the International Country Risk Guide, the World Bank Development Indicators, Government Finance Statistics from the International Monetary Fund (IMF), and the Global Data on Events, Location and Tone database (Leetaru, 2014). Tables 2

Table 1 The 20 countries and regions that formed the most sister-city relationships with Japan

No.	Country	Until 1970	1971–1990	1991–2010
1	USA	90	166	178
2	China	0	130	217
3	Korea	2	31	104
4	Australia	3	41	62
5	Canada	7	33	30
6	Brazil	10	45	2
7	Germany	7	19	27
8	France	6	24	17
9	Russia	7	11	25
10	New Zealand	0	15	25
11	Italy	3	11	19
12	Austria	7	10	15
13	Philippines	2	13	3
14	Switzerland	1	5	6
15	United Kingdom	0	3	9
16	Netherlands	2	5	4
17	Spain	0	4	7
18	Taiwan	0	5	6
19	Mexico	0	7	2
20	Belgium	1	3	4

Data source: Council for Local Authorities for International Relations (Japan).



**Table 2** Statistical summary of variables for country analysis

No.	Variable	Mean	SD	Min	Max
1	Japanese firm's FDIs in a host country	1.3	2.3	0	63
2	Sister cities	110.8	145.6	0	432
3	Fiscal decentralization	0.4	0.2	0	0.674
4	Political constraints (POLCONIII)	0.3	0.2	0	0.718
5	Goldstein scores	2.2	0.9	- 6.5	8.0
6	FDI inflows in billion USD	54.6	83.2	- 25.1	734
7	FDI-to-GDP Ratio	3.5	5.6	- 5.6	86.6
8	GDP growth	4.327	4.2	- 22.9	14.23
9	Population (logged)	7.488	1.0	2.2	8.67
10	Total assets (million USD)	0.75	2.09	0.0001	32.6
11	Gross profits (million USD)	0.17	0.4	- 0.08	5.84
12	Firm experience in host country	0.6	2.6	0	18
13	Firm experience squared	7.3	37.0	0	324

$N = 73,938$ .

**Table 3** Inter-item correlations of variables for country analysis

No.	Variable	1	2	3	4	5	6
1	Japanese firm's FDIs in a host country	1					
2	Sister cities	0.26	1				
3	Fiscal decentralization	0.08	0.68	1			
4	Political constraints (POLCONIII)	- 0.05	- 0.44	-0.55	1		
5	Goldstein scores	- 0.09	- 0.33	- 0.25	0.12	1	
6	FDI inflows	0.19	0.62	0.29	- 0.05	- 0.30	1
7	FDI-to-GDP Ratio	- 0.03	- 0.10	- 0.02	0.10	- 0.09	0.40
8	GDP growth	0.03	0.28	0.43	- 0.55	- 0.13	0.01
9	Population (logged)	0.03	- 0.18	- 0.40	0.35	0.05	0.02
10	Total assets	0.24	- 0.11	- 0.07	0.08	0.04	- 0.05
11	Gross profits	0.26	- 0.13	- 0.09	0.10	0.04	- 0.06
12	Firm experience in host country	0.18	0.04	- 0.01	0.01	- 0.03	0.09
13	Firm experience squared	0.16	0.04	- 0.01	0.01	- 0.03	0.09

No.	Variable	7	8	9	10	11	12
7	FDI-to-GDP Ratio	1					
8	GDP growth	0.06	1				
9	Population (logged)	- 0.17	- 0.36	1			
10	Total assets	0.03	- 0.07	0.01	1		
11	Gross profits	0.04	- 0.08	0.00	0.93	1	
12	Firm experience in host country	0.02	- 0.03	0.03	0.06	0.06	1
13	Firm experience squared	0.03	- 0.04	0.03	0.06	0.06	0.96

$N = 73,938$ .

and 3 present the descriptive statistics and inter-item correlations.

Empirical studies on MNCs' FDI entry are typically done at a country-level analysis (Delios & Henisz, 2003a, 2003b), or at the level of province/state (Oh et al., 2020). We conducted a fine-grained analysis at a city level to see how sister-city relationships are connected to FDI inflows by city, and a country-level analysis that yields MNCs' country selection by considering sister cities. As the analyses at these two levels require different

methodological approaches, we state the sampling, empirical approach, and results separately.

### City-Level Analytical Methods

#### *Sample construction for city-level analysis*

Our city-level analysis assesses how the stock of Japanese FDIs in a foreign city vary before and after a city in a host country forms a sister-city relationship with a Japanese city. Because Japanese Overseas Investments provides incomplete information



on subsidiary location by city, we utilized a geocoding technique to develop granular location information. This technique is commonly used in geography and spatial sciences but comparatively new to international business research. Geocoding employs intensive computation and is suitable for large samples such as ours. To implement our geocoding, we developed an algorithm for web-scraping a publicly available location dataset, which contained information on over 2 billion places and addresses worldwide. To query the location dataset, we used a geocoding application programming interface developed by Positionstack, which is a geocoding company. Our algorithm extracted information on each subsidiary's geographic coordinates; that is, their latitude and longitude.

We obtained the geographic coordinates for 35,914 foreign subsidiaries of Japanese MNCs in 2043 unique city locations. There were 10,972 subsidiaries (30%) located in host-country cities that had no sister-city relationship with a Japanese city. A total of 7466 subsidiaries (2%) were located in cities that had exactly one sister-city relationship. The remaining cases (17,477 subsidiaries) were located in places with more than one sister-city nearby.

Consider three Japanese subsidiaries in India as an illustration of these three types. First, the Japanese subsidiary Makita Power Tools was located in Bengaluru, a city that had no Japanese sister-city relationship. Second, Toyo Engineering was in Mumbai, a city that had one sister-city relationship. Third, Hayakawa International was in Pune, a city that had one sister-city relationship, but it was geographically adjacent to Pimpri-Chinchwad, which also had sister-city relationships with Japan. Because we seek to observe FDI inflows that were solely affected by the sister-city relationship of the focal city, rather than what could be affected by other sister-city relationships nearby, we retained the first two types of cases in our sample but excluded the third type of case. As our FDI data was in the 1990-2009 period, we excluded the 156 cities in our data that had formed a sister-city relationship before 1990. Finally, we structured our sample as a *city-year* panel, which comprised 24,479 observations (1286 cities in 34 countries, with a maximum 20-year observation window).

### **Dependent variable**

Although the total assets and employees of foreign subsidiaries are a good measure of the size of FDIs and used with prominence in country-level analyses of FDI flows (not firm-level flows), such financial and corporate-level information usually shows great variance across industries, firms, host countries, and time (Berry, 2006). We hence used the number of subsidiaries as our main measure of FDI levels, following prior work with similar research questions (Berry, 2006; Oh & Oetzel, 2011; Zhou, Delios, and Yang, 2002).

*Japanese FDIs in city* is the dependent variable for the city-level analysis, which is defined as the number of all Japanese subsidiaries established in a given host city in a given year. As a robustness check, we also used the number of all Japanese expatriates and total subsidiary employees as alternative measures (Delios & Bjorkman, 2000). All variables have values of non-negative integers.

### **Explanatory variables**

*Sister city* is the independent variable for the city-level analysis. This indicator variable equals 1 when there is a sister-city relationship in a given year between a focal host city and a Japanese city, and 0 otherwise. *Sister city* varies across cities and years. The sister-city relationship is considered to continue once established, unless announced as terminated, which is rare.

### **Control variables**

To capture heterogeneity across cities, we included city-specific variables as available in our geocoding database and Japanese Overseas Investments. City-specific variables include (1) city latitude, (2) city longitude, (3) a city's distance from the country's capital, which is computed using the Vincenty formula (as commonly used in geodesy to compute distances on the Earth's surface), and (4) the stock of FDIs of a city, which we operationalized as the number of Japanese subsidiaries in a city in 1990.

### **Empirical approach**

We estimated the effects of *sister city* (the "treatment") on *Japanese FDIs in a city* (the "outcome") by directly regressing the outcome on the treatment, while controlling for city-level observables. This approach compares treated observations that have a Japanese sister-city relationship (the "treatment group"), with observations that do not have a Japanese sister-city relationship (the "control group"). However, one common problem is that



cities in the treatment group may systematically differ in their ex-ante propensity to form ties compared to cities in the control group, raising plausible endogeneity concerns. We hence analyzed treated and control groups that had similar ex-ante propensities. To implement this approach, we adopted two different matching methods: (1) coarsened exact matching (CEM) (Iacus et al., 2012; Singh & Agrawal, 2011) and, (2) propensity score method (PSM) (Chang et al., 2013; Rosenbaum & Rubin, 1983). The methods are technically different, but share a common goal, which is to enable an assessment of treatment effects across comparable units. Correspondingly, we were able to unpack the impact of sister-city relationships on FDIs by comparing cities that were similar in other aspects.

CEM is a technique that aims to prune observations from a dataset so that the remaining data have a better balance between the treated and control groups. Regression estimates using matched data after CEM are likely to have a lower bias compared to estimates using unmatched data. The method has two steps – matching and regression. First, we matched cities based on their observable characteristics: (1) latitude, (2) longitude, (3) distance from the country's capital, (4) historical FDI activity, (5) country, and (6) year. The advantage of using CEM is that we can match cities based on bands for continuous covariates, thereby more accurately matching similar cities within the same country. For example, the technique matches New Delhi and Jaipur, which are two similar cities in the northern part of India, but does not match them with Chennai, which is a southern city. After obtaining a matched sample, we estimate negative binomial regression models, which are appropriate for modeling count data. Estimations use robust standard errors. For a focal city  $c$  in year  $t$ , we estimate:

$$\begin{aligned} & \text{Japanese MNCs' FDIs in city}_{c,t+3} \\ &= \beta_0 + \beta_1(\text{Establishment of sister} \\ & \text{-relationship by city})_{ct} + \beta_{2c}(\text{city-level controls})_{ct} + e_{ct} \end{aligned}$$

We used PSM to estimate direct treatment effects; that is, how FDIs in a city are affected by the formation of sister-city relationships. The method computes an observation's predicted probability of treatment, matches observations based on these predicted treatment probabilities, and directly computes treatment effects as the difference in means in the outcome variable between treatment and

control groups. We used the Stata 15 command *teffects psmatch* to compute average treatment effects. Specifically, we estimated how the establishment of a sister-city relationship was associated with differences in Japanese FDI across otherwise similar cities. Formally, average treatment effects can be expressed as the difference ( $\Delta$ ) in expected FDIs in two similar cities  $c$  and  $d$  with observable characteristics  $X_c$  and  $X_d$  whose ex-ante probabilities of tie formation are more-or-less equal:

$$\begin{aligned} \Delta &= E[I_c | S(X_c) = 1, X_c] - E[I_d | S(X_d) = 0, X_d], \\ & \text{where } S(X_c) \approx S(X_d) \end{aligned}$$

where  $I_c$  and  $I_d$  are Japanese FDI in cities  $c$  and  $d$  from years  $t$  to  $t+3$ , formation of a sister-city relationship  $S$  at time  $t$  is given by ( $S = 0$  or  $S = 1$ ), where  $S_t$  is conditional on a city's observable characteristics  $X_{t-1}$ .

### City-Level Analysis Results

Table 4a provides the results of the CEM analysis. Models 1, 3, and 5 provide regression estimates using the original unmatched sample ( $n = 24,479$ ). Models 2, 4, and 6 use the matched sample, with pruned observations ( $n = 2352$ ). We have different measures of our dependent variable, Japanese FDIs by city. Models 1 and 2 use Japanese subsidiaries, models 3 and 4 use Japanese expatriates, and models 5 and 6 use the number of people employed in Japanese firms. We find that the formation of a sister-city relationship is positively associated with Japanese FDI in a city, in the unmatched sample (model 1:  $\beta = 0.91$ ,  $p < 0.01$ ) and the matched sample (model 2:  $\beta = 1.12$ ,  $p < 0.01$ ). Models 3 to 6 with alternative measures of FDI also provide consistent results. Overall, our results support Hypothesis 1.

Table 4b provides the results of the propensity score analysis. The propensity score analysis directly estimates the average treatment effects; that is, the effects of the formation of a sister-city relationship by a focal city on a Japanese MNCs' FDIs in that city. The three models differ in the measurement of the outcome variable; model 1 uses subsidiaries; model 2 uses expatriates; model 3 uses employees. Average treatment effects are positive (model 1:  $\beta = 1.10$ ,  $p < 0.01$ ; model 2:  $\beta = 2.08$ ,  $p = 0.05$ ) with lower statistical significance in model 3 (model 3:  $\beta = 128$ ,  $p = 0.13$ ). The result support Hypothesis 1.

**Table 4** Sister-city relationships and Japanese FDIs (city-level analysis)

Panel 4a. Matched sample analysis using negative binomial regressions with coarsened exact matching						
	1	2	3	4	5	6
<i>Aggregate FDIs measured using:</i>	Japanese subsidiaries in city	Japanese subsidiaries in city	Japanese expatriates in city	Japanese expatriates in city	Number of people employed in Japanese firms	Number of people employed in Japanese firms
Sample	Unmatched sample	Matched sample	Unmatched sample	Matched sample	Unmatched sample	Matched sample
Formation of sister-city relationship with Japan <b>(H1)</b>	0.91 (0.15) [0.00]	1.12 (0.12) [0.00]	0.68 (0.19) [0.00]	1.26 (0.12) [0.00]	0.78 (0.35) [0.03]	1.17 (0.33) [0.00]
FDIs in city before 1990	7.94 (2.09)	8.30 (2.54)	8.16 (2.88)	6.25 (3.08)	5.76 (1.93)	5.84 (2.62)
Latitude of city	- 7.53 (3.74)	0.79 (12.5)	- 18.4 (6.95)	- 18.2 (22.2)	- 17.3 (12.3)	4.52 (35.9)
Longitude of city	3.85 (0.85)	4.01 (1.59)	1.82 (1.03)	0.32 (1.02)	8.73 (2.08)	10.6 (1.59)
City's distance from country's capital	- 0.32 (1.34)	- 17.5 (16.9)	- 1.06 (1.17)	- 4.47 (9.44)	- 0.24 (3.47)	- 14.4 (8.93)
Constant	- 1.13 (0.16)	- 1.36 (0.52)	- 0.05 (0.32)	- 0.20 (0.87)	4.01 (0.47)	3.16 (1.34)
Observations	24,479	2352	24,479	2352	24,479	2352
Panel 4b. Estimation of average treatment effects using a propensity score matching estimator						
Outcome variable	1	2	3			
	Japanese subsidiaries in city	Japanese expatriates in city	Number of people employed in Japanese firms			
Average effects of formation of Japanese sister-city relationship by focal city <b>(H1)</b>	1.10 (0.08) [0.00]	2.08 (1.04) [0.05]	128 (85.6) [0.13]			
Number of observations	8176	8176	8176			

1. Number of strata = 7911; number of matched strata = 77.

2. The treatment is formation of sister-city tie with Japan.

3. Coarsened matched variables include Geo-coded location of city (latitude, longitude) and Distance from capital of country. Exact matched variables include Year and Country.

4. Robust standard errors are in parentheses; *p* values for main variables reported in square brackets.

Matching variables include FDI in city prior to 1990, Geo-coded location of city, Distance of city from country's capital, Country, and Year. Robust standard errors are in parentheses; *p* values reported in square brackets.

## Country-Level Analysis Methods

### Sample construction

We constructed a sample for the country-level analysis on the impact of sister cities on an MNC's country selection. The first step was to identify FDI entries in our focal time period. We obtained 20,379 cases of subsidiary establishment made by 1135 Japanese firms in 58 host countries during 1990-2009. We then structured these data in a *firm-country-year* format. Next, following prior studies that employed similar choice models (Henisz & Delios, 2001), we assumed that every firm stood a

chance to enter any country in each year. For each firm, we constructed counterfactual observations, which were the FDIs that were theoretically possible, but never occurred. We excluded countries that had never received any incoming Japanese FDI throughout the observation window. We hence had data in a large panel with a firm-country-year structure. We then appended the corresponding firm-specific and country-specific control variables. Finally, our sample for analysis had 80,071 observations, with 823 country-years that have a positive value (i.e., had an FDI entry or entries).



### Dependent variable

*Japanese firm's FDIs in a host country* is the dependent variable used for the country-level analysis. The variable is computed as the accumulative number of Japanese subsidiaries; that is, the total number of subsidiaries existing in a host country in a given year. We use this variable to test Hypotheses 2 to 4. Similar to the city-analysis, we used two alternative measures, total employees and Japanese expatriates of a firm in a host country (Delios & Bjorkman, 2000).

### Explanatory variables

*Sister cities* is the count of the sister-city relationships between Japan and a host country in a given year. The variable measures the degree to which the home and host countries are linked with sister cities.

The moderator for Hypothesis 3 is *fiscal decentralization*, which measures the degree of autonomy of subnational governments, or the extent to which a subnational government is granted authority to allocate fiscal resources. This variable is computed as the proportion of overall governmental spending that is managed by subnational governments in a host country in a given year (Enikolopov & Zhuravskaya, 2007). *Fiscal decentralization* ranges from 0 to 0.67 in our sample. Higher scores of *fiscal decentralization* denote greater autonomy for subnational governments in the allocation of public resources. We obtained this variable from the Government Finance Statistics database provided by the International Monetary Fund.

*Political constraints* is the moderator for Hypothesis 4. It measures the level of constraints posed by political and legal sectors on the administration of a host-country government (Henisz, 2002). We used the variable POLCONIII from the Political Constraints Index created by Henisz (2000a, 2000b). *Political constraints* ranges from 0 to 0.71. Higher values relate to greater policy consistency and hence less uncertainty. The three focal explanatory variables vary across countries and years.

### Control variables

For the country-level control variables, we measure changes in bilateral relationships between a host country and Japan by computing *Goldstein scores* between a host country and Japan. Bilateral relationships between a pair of countries are influenced by interactions in economic, social, and political domains. Following prior studies (Caves & Caves, 1996; Gleditsch et al., 2014), we used the Global

Data on Events, Location and Tone, which is a database that collates information, from a variety of media sources, on official and civilian interactions between countries. Each interaction between a pair of countries is an event. The database assigns a score to each event based on the Goldstein scale (Goldstein, 1992).

We computed a host country's *Goldstein scores* as an average of the event scores in a given year. Countries that have higher *Goldstein scores* have deeper bilateral relations with Japan. We also included the economic and demographic characteristics of the host country that affect MNCs' FDI entries (Caves & Caves, 1996; Dunning, 2000; Henisz & Delios, 2001). *FDI inflow* is the net FDI flows to the host country in a given year. *FDI-to-GDP ratio*, is computed as FDI stock divided by the gross domestic product (GDP), in a given year. *GDP growth* is the annual growth rate in GDP. *Population* is the natural logarithm of the population of a country, in a given year. We obtained these variables from the World Bank's World Development Indicators database.

For firm-level control variables, we controlled for the differences in firms' resources and capabilities that could affect their investment behavior. *Total assets* is the book value of a firm's total assets, which measures firm size. *Gross profits* is the ratio of profits to total sales, which measures firm performance. *Host-country experience* is the count of elapsed years since a firm entered a host country (Makino and Delios, 1996). We also include the squared term of experience to account for its non-linear effect. The firm-level variables vary by firm and within firms over time. Finally, we controlled for firm-specific and year-specific effects by including indicator variables for firms and the year of an observation.

### Empirical approach

Our dependent variable for the country-level analysis, *sister-city relationships*, is a non-negative integer. The mean of the variable is not equal to its standard deviation. Therefore, we used negative-binomial estimation. Since our data have multiple observations for a given firm, we compute standard errors by clustering by firm. With our sample in a *firm-country-year* structure, we assessed how the number of sister-city relationships in a host country affected a given Japanese firm's FDIs in that country. For a Japanese firm  $i$  in host country  $c$  in year  $t$ , we specify the following model:

Number of subsidiaries<sub>ict</sub>

$$\begin{aligned} &= \beta_0 + \beta_1(\text{Sister cities between host country and Japan})_{ct} \\ &\quad + \beta_c(\text{country-level controls})_{ct} \\ &\quad + \beta_i(\text{firm-level controls})_{it} \\ &\quad + \mu_i + \eta_c + \gamma_t + e_{ict} \end{aligned}$$

where  $\beta_c$  and  $\beta_f$  are vectors of estimates for country- and firm-level controls respectively,  $\mu_i$  are firm fixed effects,  $\eta_c$  are country fixed effects,  $\gamma_t$  are year fixed effects, and  $e_{ict}$  is the error term. One challenge of this specification is that fixed-effects dummies increase computational difficulty for model convergence. Nevertheless, we applied these fixed effects wherever feasible because they help minimize concerns that our estimates will be affected by firm-specific, time-invariant heterogeneity.

### Country-Level Analysis Results

We begin with the statistical summary of the main variables. Sister cities are positively correlated ( $r = 0.67$ ) with fiscal decentralization, which suggests that countries with a greater degree of autonomy granted to subnational governments tended to have a greater number of sister cities with Japan. The mean variance-inflation factor was 4.87, which was below prescribed limits (rule-of-thumb: 10). Multicollinearity is unlikely to materially affect our coefficient estimates (Kutner et al., 2004).

Table 5 reports results for the country-level analysis using negative binomial models. All models include firm, country, and year fixed effects. Due to space constraints, we do not report estimates for fixed effects. Model 1 is a baseline model that includes control variables. We find that good bilateral relationships between countries is positively associated with MNCs' FDIs. We next test Hypothesis 2 regarding the effect of sister cities on a firm's FDI in the host country (models 2 to 7). The estimated coefficient for *sister cities* is positive model 2 ( $\beta = 6.58, p < 0.001$ ), with consistent results in models 6 and 7 that use alternative measures for FDI. Since the estimation models include the Goldstein scores, the estimated effects of subnational relationships are over and above the effects of national ties.

To better understand the substantive economic implications of these results from the estimates of negative binomial models (Meyer et al., 2017), we computed the elasticity of *sister cities* at the mean value of *sister cities*, conditional on other variables at sample means (Natarajan et al., 2019). We found

that a 1% increase in the number of Japanese sister-city relationships in a host country is associated with an increase of 0.73% in FDI counts by Japanese MNCs in that host country. Interestingly, a 1% improvement in country-level relationships, as measured by the Goldstein scores, was associated with only a 0.02% increase in FDI counts. These effects suggest that subnational actions can meaningfully add to their national counterparts in influencing FDI. Overall, the analysis provides strong support for Hypothesis 2.

Next, we hypothesized that the positive effect of sister cities on a firm's investment propensity will be greater (1) when subnational governments have a greater level of autonomy (Hypothesis 3), and (2) when there are greater political constraints on governments of a host country (Hypothesis 4). We find that the interaction term between *sister cities* and *fiscal decentralization* has a positive coefficient estimate, with a low variance around the estimate, as in model 3 ( $\beta = 34.8, p < 0.001$ ) and model 5 ( $\beta = 5.92, p < 0.001$ ). Whereas the main effect of political constraints has its expected positive coefficient in model 3 ( $\beta = 0.18, p < 0.001$ ), the interaction between *sister cities* and *political constraints* has a negative coefficient in model 4 ( $\beta = -33.9, p < 0.001$ ) and model 5 ( $\beta = -29.9, p < 0.001$ ). To better understand the results of the non-linear models (Greene, 2010; Meyer et al., 2017), we computed marginal effects and corresponding 95% confidence intervals at multiple combinations of sister cities and the moderators (Figure 2). As predicted in Hypothesis 3, the marginal effects of sister-city relationships are greater when fiscal decentralization is higher. Contrary to our expectation, the effects of sister-city relationships become less when the political constraints are higher. In short, we find support for Hypothesis 3, but no support for Hypothesis 4.

### Additional Analysis

First, if as we argue, decentralized intergovernmental ties improve information flows between MNCs and local policymakers, the decision to invest in a sister city should be reflective in investment motivations that connect to the benefits of such communication. We tested this point by replicating our city-level analysis using a new dependent variable *Japanese FDIs that received preferential treatment in city*, which is the number of Japanese subsidiaries that had "preferential treatment from local governments" as their reported motivation for FDI. We obtained the expected result that the positive effect

**Table 5** Sister cities and Japanese MNCs' FDIs in host countries (country-level analysis)

Dependent variable: Japanese MNCs' FDI in host country	1	2	3	4	5	6	7
						Alternative measures for dependent variable	
Measure:	Number of subsidiaries	Number of subsidiaries	Number of subsidiaries	Number of subsidiaries	Number of subsidiaries	Number of expatriates	Number of employees
Sister cities ( <b>H2</b> )		6.58 (0.35) [0.00]	- 14.1 (0.88) [0.00]	10.5 (0.51) [0.00]	6.52 (1.13) [0.00]	6.96 (0.80) [0.00]	4.30 (1.21) [0.00]
Sister cities X Fiscal decentralization ( <b>H3</b> )			34.8 (1.44) [0.000]		5.92 (1.59) [0.000]		
Sister cities X Political constraints ( <b>H4</b> )				- 33.9 (1.35) [0.000]	- 29.9 (1.57) [0.000]		
<i>Host-country characteristics</i>							
Fiscal decentralization	0.94 (0.30)	3.28 (0.30)	- 1.28 (0.30)	1.21 (0.27)	0.67 (0.31)	3.29 (0.51)	3.45 (0.84)
Political constraints (POLCONIII)	0.11 (0.05)	0.32 (0.05)	0.18 (0.053)	0.74 (0.062)	0.67 (0.06)	0.18 (0.10)	0.38 (0.13)
Goldstein scores	0.01 (0.004)	0.008 (0.004)	- 0.002 (0.004)	0.014 (0.004)	0.01 (0.004)	0.01 (0.009)	0.02 (0.01)
FDI inflows ('000 billion)	- 0.53 (0.11)	- 2.19 (0.09)	- 1.81 (0.08)	- 0.80 (0.08)	- 0.90 (0.09)	- 1.42 (0.20)	- 1.30 (0.29)
FDI-to-GDP ratio	- 3.97 (1.18)	12.2 (1.14)	8.92 (1.15)	3.05 (1.22)	3.60 (1.24)	7.08 (3.05)	7.96 (3.10)
GDP growth	8.84 (1.74)	2.16 (1.77)	- 8.92 (1.76)	- 1.00 (1.75)	- 2.58 (1.65)	5.10 (3.77)	0.29 (4.13)
Population (logged)	- 0.03 (0.01)	- 0.08 (0.01)	- 0.14 (0.02)	- 0.13 (0.02)	- 0.13 (0.02)	- 0.04 (0.03)	- 0.06 (0.04)
<i>Firm characteristics</i>							
Total assets	0.03 (0.02)	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.11 (0.15)	0.13 (0.06)
Gross profits	- 0.19 (0.13)	- 0.15 (0.12)	- 0.14 (0.12)	- 0.14 (0.11)	- 0.14 (0.11)	- 1.17 (0.85)	- 0.57 (0.34)
Firm experience in host country	0.14 (0.01)	0.14 (0.01)	0.14 (0.01)	0.14 (0.01)	0.14 (0.01)	0.09 (0.01)	0.12 (0.02)
Firm experience squared	- 0.008 (0.0007)	- 0.008 (0.0007)	- 0.008 (0.0007)	- 0.008 (0.0007)	- 0.008 (0.0007)	- 0.004 (0.001)	- 0.005 (0.001)
Constant	- 0.60 (0.22)	- 3.26 (0.23)	- 0.58 (0.26)	- 2.97 (0.26)	- 2.56 (0.28)	- 2.46 (0.48)	4.01 (0.77)
Firm fixed effects	Included	Included	Included	Included	Included	Included	Included
Country fixed effects	Included	Included	Included	Included	Included	Included	Included
Year fixed effects	Included	Included	Included	Included	Included	Included	Included
Observations	80,071	73,938	73,938	73,938	73,938	47,126	47,126

All regressions use negative binomial models. For convenience in reporting, regressions use scaled variables for *Sister Cities*, *FDI-to-GDP ratio* and *GDP growth*. Clustered standard errors are in parentheses; *p* values for main variables reported in square brackets.

of sister cities was greater for those inward FDIs that reported the preferential treatment motivation (see Table 6).

Second, we examined how host-country conditions alter the influence of sister cities on FDI decisions (Table 7). A host country's exposure to Japanese culture could influence both tie formation

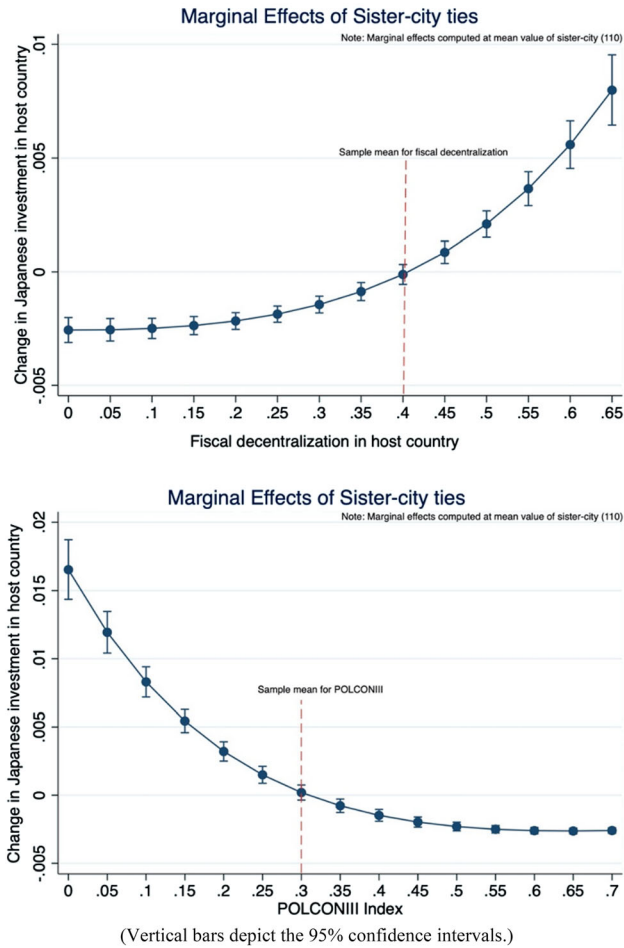


Figure 2 Marginal effects of sister-city relationships.

and FDIs into the host country (Rangan & Sengul, 2009). In model 1, we added the number of Japanese residents in a host country. Results remained consistent. Next, we tested whether country-level bilateral relationships substituted or complemented the effect of city-level ties. Model 2 shows that the interaction between sister cities and the Goldstein scores was positive and significant ( $p < 0.001$ ), which provides some evidence that national and subnational ties can operate in a complementary manner.

Further, there is a possibility that some countries may undergo political transitions, which could affect the propensity of tie formation and FDI inflows. We introduced into our analyses *democracy index*, which is a time-varying continuous measure of democracy, from the Polity IV database published by the Center for Systemic Peace. We found that the effect of sister cities is less in countries with a higher level of democracy. As democratic

countries tend to have greater political constraints (Henisz, 2000a, 2000b), this result aligns with our findings in Hypothesis 4. A possible explanation is that sister cities provide an MNC with an important form of insulation from national-level policy uncertainty in less democratic countries, and in countries with weak political constraints. To corroborate this explanation, we returned to the city analysis. We found that in samples with lower political constraints, the positive influence of sister cities on FDI inflows was even greater.

Finally, to understand better the implications of locating an FDI in a sister city, we used sales growth rates in a subsidiary to compare post-entry FDI performance in sister cities and in other cities. Our regressions did not show any performance differences. Clearly, this analysis is coarse, with a deeper analysis needing better data and empirical modeling, whose demands extend beyond the scope of this study. But this result provides similar implications as in prior studies that an MNC's location choice is mainly based on its ex-ante judgement of FDI opportunities, which need not necessarily be manifested explicitly into ex-post performance improvements or declines (Delios & Henisz, 2003a, 2003b). Taken together, the supplementary tests align with our main premise, namely, that sister cities facilitate information flows between government and business, which widens the potential choice set for FDI decisions.

## DISCUSSION

It is abundantly clear that political environments and bilateral official ties at the country level influence the destination and intensity of FDI flows (Desbordes, 2010; Hu & Lu, 2014; Li & Vashchilko, 2010; Li et al., 2018; Neumayer & Spess, 2005). Because most countries have substantial subnational variance in political institutions and in the consequent subnational investment environments, country-level analysis alone cannot account for the subnational geographic dispersion of FDI flows. We are motivated to understand whether intergovernmental ties at subnational levels can likewise influence the destination and intensity of FDI flows. We explore this question using sister-city relationships as the focal point of our analysis.

Our proposal that sister cities could provide value in coordinating FDI rests on the economic notions of the advantages of decentralization in coordinating information and production (Hayek, 1945; Marschak, 1959). We hence ground our study in



**Table 6** Analysis on FDIs motivated by a local government's preferential treatment

FDIs measured using Japanese subsidiaries	1		2		3		4	
	Main analysis (from Table 4a)				Supplementary analysis			
	Japanese FDIs in city				Japanese FDIs that received preferential treatment in city			
	Unmatched sample		Matched sample		Unmatched sample		Matched sample	
Formation of sister-city tie with Japan	0.91 (0.15)	1.12 (0.12)	2.08 (0.92)	2.29 (0.66)				
Investments in city before 1990	7.94 (2.09)	8.30 (2.54)	1.03 (0.15)	8.64 (4.28)				
Latitude of city	- 7.53 (3.74)	0.79 (12.5)	- 0.17 (9.40)	5.78 (16.0)				
Longitude of city	3.85 (0.85)	4.01 (1.59)	7.67 (3.33)	23.1 (0.56)				
City's distance from country's capital	- 0.32 (1.34)	- 17.5 (16.9)	- 7.17 (8.05)	- 0.20 (0.15)				
Constant	- 1.13 (0.16)	- 1.36 (0.52)	- 5.16 (0.51)	- 8.88 (1.51)				
Observations	24,479		2,352		24,479		2,352	

(1) Regressions provide additional empirical support for city-level analyses. The models use the same specifications as those in reported in Table 4a. (2) The dependent variable *Japanese FDIs that received preferential treatment in city* is computed as the number of Japanese subsidiaries that had "preferential treatment from local governments" as their reported motivation for FDI and were established in a given host city in a given year. (3) Models 1 and 2 replicate the corresponding results in Table 4a, while models 3 to 4 are new results. The effect of sister cities on FDIs that received preferential treatment from local government (model 4:  $\beta = 2.29$ ,  $p < 0.05$ ) is greater than the effect of sister cities on all FDIs (model 2:  $\beta = 1.12$ ,  $p < 0.01$ ), with a statistically significant difference between their magnitudes ( $p = 0.08$  for difference of magnitudes). This result shows that compared to all FDIs, sister cities are more likely to have FDI, when the motivation for the FDI is stated to be receiving preferential treatment from the local government. (4) Robust standard errors are reported in parentheses.

core concepts and arguments from this line of research, as it concerns the advantages of decentralized administration in inviting FDI to a country and to subnational regions (Cai & Treisman, 2005; Enikolopov & Zhuravskaya, 2007; Kessing et al., 2014; Qian & Weingast, 1997). Structured and developed in this manner, our study necessarily draws attention to subnational governments as decentralized entities, and particularly their role in fostering favorable foreign investment conditions, and hence the influence on location strategy of MNCs' FDIs (Beugelsdijk & Mudambi, 2013; Chan et al., 2010; Jia & Mayer, 2017; Ma et al., 2013).

Consequently, we identify how subnational governments reflect local priorities on domestic interests, and how MNCs can operate within those priorities to establish relationships with local political actors that are cooperative and pragmatic. Sister-city relationships are valuable in this regard because managers in an MNC can leverage these ties to collect information, reduce uncertainty, and build localized political capital and capabilities. With our focus on sister cities, we help explain

subnational heterogeneity in FDI inflows, while also providing insight into strategies for overcoming localized uncertainties (Luo, 2001, 2004, Zhong et al., 2019).

Next, and again given our focus on the sister-city relationship and its impact on FDIs, we have three commensurate contributions. The first is to generate credible knowledge and evidence on the benefits of sister cities. Prior studies have used anecdotal cases of sister-city exchanges to illustrate their benefits (Cremer et al., 2001; Ramasamy & Cremer, 1998; SCI, 2015). Our city-level analysis provides a powerful complement to this research. Our econometric modeling makes significant progress on controlling for endogeneity concerns and helps us tease out the influence that sister-city relationships have on within-country and cross-country FDI flows. We supplement these statistical findings with descriptive examples and depictions of how MNCs can benefit from sister cities in their FDI.

Yet, as we have mentioned, subnational regions are embedded in a broad set of national-level institutions. Hence, for our second contribution, we identified how the effects of sister cities are

**Table 7** Additional analysis: Role of host-country characteristics in shaping sister-city influences on FDI

Dependent variable: Japanese MNC's FDIs in host country (number of subsidiaries)	1	2	3
Analysis:	Control for Japanese residents in host country	Interaction with Goldstein index	Include democracy index
Sister cities ( <b>H2</b> )	15.3 (1.09) [0.00]	6.27 (0.35) [0.00]	11.0 (0.55) [0.00]
Sister cities X Goldstein scores		0.18 (0.04) [0.00]	
Sister cities X Democracy index			- 1.49 (0.05) [0.00]
Fiscal decentralization	3.40 (0.30)	3.21 (0.30)	0.91 (0.27)
Political risk (POLCONIII)	0.22 (0.04)	0.32 (0.05)	0.04 (0.04)
Goldstein scores	0.03 (0.005)	0.0003 (0.005)	0.008 (0.004)
Democracy index			0.015 (0.003)
FDI inflows ('000 billion)	- 0.58 (0.06)	- 2.18 (0.09)	- 0.35 (0.08)
FDI-to-GDP ratio	4.09 (0.83)	12.1 (1.14)	- 0.25 (1.22)
GDP growth	9.42 (2.03)	1.08 (1.79)	- 5.24 (1.79)
Population (logged)	- 0.04 (0.01)	- 0.08 (0.0)	- 0.12 (0.01)
Total assets	0.02 (0.01)	0.03 (0.01)	0.03 (0.01)
Gross profits	- 0.06 (0.09)	- 0.16 (0.12)	- 0.15 (0.11)
Firm experience in host country	0.13 (0.01)	0.14 (0.01)	0.14 (0.01)
Firm experience squared	- 0.007 (0.0006)	- 0.008 (0.0007)	- 0.008 (0.0007)
Japanese residents (millions) in host country	- 6.85 (0.81)		
Constant	- 5.71 (0.34)	- 3.20 (0.23)	- 2.92 (0.27)
Firm fixed effects	Included	Included	Included
Country fixed effects	Included	Included	Included
Year fixed effects	Included	Included	Included
Observations	54,391	73,938	73,938

All regressions use negative binomial models. For convenience in reporting, regressions use scaled variables for *Sister cities*, *FDI-to-GDP ratio*, and *GDP growth*. Clustered standard errors are in parentheses. *P* values for main variables reported in square brackets.

conditioned on policy structure and the political institutions of a host country. As a way into this consideration, we concentrated on core notions of decentralization, specifically on understanding

how the division of responsibilities between a national government and subnational governments influenced the effects of sister-city relationships (Kozhikode & Li, 2012; Tiebout, 1956). We



found that sister cities have a stronger influence on an MNC's FDI decision, when subnational governments are granted more autonomy and more discretion in using public resources. Put simply, sister cities are more effective when local politicians have more fiscal discretion, or when the degree of fiscal decentralization increases. These findings support the arguments about the advantages of decentralization in coordinating an economy.

As a second way to unpack this issue, we next considered the influence of constraints posed on political actors by national-level political institutions. Contrary to our expectations as stated in Hypothesis 4, where we predicted that greater policy-making certainty at the national level would feed into more credibility for relationships and agreements with subnational governments, we instead found that sister cities had a stronger positive influence on a country FDI's inflows when its national-level governments were less constrained by the political institutions (Delios & Henisz, 2003a, 2003b; Henisz, 2004). This result offsets the positive influence we observe for the independent, main effect of political constraints on FDI. Taken together, these findings, which were mirrored in our use of the democracy indicator, suggest that sister cities can provide an important buffer from national-level policy uncertainty through the information and networking that connects home and host subnational governments with the MNC. This finding provides an important complement to research that identifies the various strategies that MNCs can use to mitigate the effects of national-level policy uncertainty (Delios & Henisz, 2003a, 2003b).

This finding also connects us to our third contribution, which is to identify the unique value a sister-city relationship can bring to local regions in a country. Prior research at a subnational level has focused on the regulatory aspects of political environments such as political systems, taxes, and policies (Chan et al., 2010; Cheng & Kwan, 2000; Ma et al., 2013; Zhou et al., 2002). Sister cities, in contrast, involve neither compulsory responsibilities on governments, nor regulatory constraints, and therefore no change in delegation or divide in formal government authority is required. As such, sister cities sit in a nation's business environment, but the extent to which they can alleviate endemic weaknesses in national-level institutions is at question (Henisz, 2000a, 2000b). In this sense, sister cities are not a replacement to Special Economic Zones (SEZs), which have special institutions and

are islands of policy certainty in regions of policy uncertainty (Zhou et al., 2002). Even so, sister cities do work as a form of a decentralization in practiced authority and provide some insulation from the uncertainties that come from government actors who are otherwise weakly constrained given the structure of a nation's political institutions.

Further, and perhaps most conclusively, sister cities provide benefits that are akin to the benefits of a network: sister cities help foster the development of loosely constructed channels that link business, government, and other stakeholders, which in turn provide a platform for communication and networking. Sister cities provide this benefit, yet even with the costs they incur, they are an effective and flexible official arrangement for promoting a local economy, relative to other means such as tax exemptions or subsidies (Han et al., 2018; Lu et al., 2014). With this statement, we return to the core of our study by which we contribute to long-standing discussions about the advantages of decentralized coordination in an economy (Hayek, 1945; Tiebout, 1956) by demonstrating what role a local government can play in proactively promoting a local economy by inviting FDI inflows.

As a supplement to these three core contributions, we also build on ideas of how a home-country government can be active in influencing the receptiveness of other countries to outward FDI (Luo, 2004; Wang et al., 2012). As connected to the bargaining process model between MNCs and host governments (Dunning, 1998; Vernon & Vernon, 1977), we extend ideas in Ramamurti (2001) to include the home-country government in this bargaining model. Although our evidence is not direct, the findings of our study indicate that sister cities can be an avenue for a home-country government to participate in this bargaining process. That is, an MNC can use sister cities to connect their home-country government to the business-government relationship in the host country. Our subnational focus and unique context usefully add to national-level work that explored similar ideas, and subnational studies that concern formal incentives and policies for outward FDI (Ingram et al., 2005; Li & Vashchilko, 2010; Lu et al., 2014; Neumayer & Spess, 2005).

We call for future research along these lines. The empirical setting of our study is confined to MNCs from an advanced economy. Japanese manufacturing firms are advantaged in capital, technology, and management skills and are consequently



avored for the localized benefits that can come from their FDI. Future research should explore how sister cities could benefit MNCs from emerging economies, which in general lack the aforementioned advantages. Although we focus on FDI and the entry decision, future research could explore the influence that official subnational ties, such as sister cities, have on the ownership structure of FDIs and relatedly the governance strategy of MNCs, FDI performance and productivity, and other aspects of an MNC's global strategy.

## CONCLUSION

We evaluate and explain the influence of a sister-city relationship on the FDI location decision at both the city (subnational) level and the country level. We find that the establishment of a sister-city relationship as a decentralized organization for practiced authority in a local government leads to increases in expected numbers of FDIs in sister cities, and in the countries in which sister cities are located. As support for our explanations that sister-city relationships can (1) heighten the profile of a potential investment location, (2) increase information and understanding of a potential investment location, and (3) sway policy and incentives from the country of the sister-city partner towards an MNC. Our line of research thereby complements

and extends previous research on localized effects, for example how local agglomeration or how specialized local policies, such as SEZs, can have positive effects on the subnational and national location decisions. As such, our research emphasizes the complex nature of the FDI decision. It is driven in part by country-level factors. Clearly, however, there is power in decentralization in authority to the local political and social environment, which further motivates an MNC's FDI location decision, as manifest in our study where we focused explicitly on the drawing power of a sister-city relationship.

## ACKNOWLEDGEMENTS

Research reported in this paper was supported by King Fahd University of Petroleum & Minerals (Small/Basic Research Grant SF201-MGTMKT-665) and by financial assistance from CUHK Business School. We benefitted from comments from Kulwant Singh, Shu Yu, and the reviewers and audience at the Academy of Management Annual Conference 2016 in Anaheim. We are grateful to Yoshihide Sugimoto, Qianqian Luo, and Zhaowei Chen for helping collect data. We thank JIBS editor Arjen van Witteloostuijn and two anonymous reviewers for their thoughtful comments and suggestions.

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*Accepted by Arjen van Witteloostuijn, Area Editor, 23 January 2021. This article has been with the authors for two revisions.*