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Industry Concentration and Venture Capital Flows around the World

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Abstract

This paper explores the relationship between the international venture capital (VC) activity and industry concentration levels in the countries of investors (origins) and those of target companies (destinations). With the international sample of VC transactions covering 65 industries and 67 countries during 1980-2016, we find a significant positive association between the flow of cross-border VC investments and the difference in industrial concentration levels between the origin and destination countries. This result is robust to (i) the inclusion of various control variables identified by the extant literature, (ii) inclusion/exclusion of the US-destined investments, and (iii) alternative estimation methods.

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1. Introduction

There is a broad stream of literature looking at various determinants of the cross-border venture capital (VC) activity distinguishing the outgoing (export), the incoming (import), and the bilateral flows of VC[1].

Focusing on exports, Alhorr et al. (2008) studied the economic integration mechanisms, namely market and currency commonalities, adopted in European countries. They concluded that these commonalities stimulate the outgoing VC flows into neighboring countries. Guler and Guillén (2010a) investigated how network advantages of the VC firms (VCFs) in their home countries shape their cross-border activity. Their findings suggest that VCFs' social status at home is a robust predictor of their foreign entry. Madhavan and Iriyama (2009) looked at the socio-demographics between pairs of countries. Their evidence suggests that the immigration of skilled labor into the US also drives the flows of VC from the US into the countries from which this labor comes.

Other studies looked at the country characteristics that "import" VC from abroad. Guler and Guillén (2010b) adopt an institutional perspective and demonstrate that home market characteristics, such as technological development, legal and political stability and investor protection, are fostering the high-growth and innovative investment opportunities and attracting the US VC investors. Relatedly, Aizenman and Kendall (2012) document how macro-level characteristics like the quality of the business environment, military expenditures, and deeper financial markets in a given country affect the intensity of the incoming VC flows. Groh et al. (2010) survey a plethora of institutional and socio-economic country characteristics and construct the venture capital and private equity country attractiveness indices[2].

Finally, extant research also suggests that bilateral flows of VC between countries are affected by the *differences* in various socio-economic characteristics that exist between the investor country (hereafter referred to as origins) and the target country (hereafter referred to as destinations). In this context, Schertler and Tykvová (2011, 2012) uncover how the dynamics of the expected growth rates and stock market capitalizations between origins and destinations shape cross-border investments. In the similar vein, Bertoni and Groh (2014) suggest that differentials in the exit market conditions affect the cross-border VC flows and syndication decisions between foreign and local VCFs.

In this paper we look at the hitherto unexplored relationship between cross-border VC flows and industry concentration. The following rationale serves as a guiding principle. First, concentration is linked to the intensity of competition within a given industry implying that more concentrated (and oligopolistic) industries are less competitive and present stronger entry barriers (Rhoades, 1993; Hou & Robinson, 2006). Second, we also know that VCFs learn and specialize into specific industries (Gompers et al., 2009; Ewens & Rhodes-Kropf, 2015; Hull, 2017). Therefore, given the "liability of foreignness", when these investors decide to move capital abroad, we may naturally expect them to target industries they are familiar with on the one hand, and plausibly with weaker entry barriers on the other. The strength of entry barriers is likely to be gauged in relation to what VCFs already know from their local experience, i.e. the state of concentration in investors' preferred industries. In this micro-level setup, it is the difference in target

[1] Devigne et al. (2018) provide a review.

[2] See also https://blog.iese.edu/vcpeindex.

industry concentration between origins and destinations that matters and not the absolute concentration at destinations only. We denote this difference as industry concentration *differential*. In a cross-section, a large *differential* helps identifying the static association between the strength of entry barriers and investment flows intensity. Moreover, to the extent that entry barriers weaken, and concentration *differentials* widen over time, a greater capital flows intensity is plausible as more and more investors crowd in. If this story holds, then on a macro-level we should be able to observe a positive association between the increases in industry concentration differentials and VC flow from origins to destinations.

This paper naturally embeds itself into the above-mentioned bilateral VC flow perspective. We also build on the "transferability" assumption discussed by Guler and Guillén (2010a). While they discuss the transferability of the network status, we rely on the assumption of transferability of a very specific set of skills - those related to the specialization of VCFs into particular industries. One important remark is in order here. Some of the studies discussed above (e.g., Guler and Guillén (2010a, 2010b)) focus on the micro-level VCF's decision to invest abroad. Given our country focus we, in contrast, perform our analyses at a macro-level in the spirit of Schertler and Tykvová (2011). Our paper is particularly related to the conceptualization of the influence of economic factors (in our case, the industry concentration differentials) within a two-country demand-supply framework proposed by Schertler and Tykvová (2012).

We document that the intensity of cross-border VC investments is associated with the industry concentration differentials. In particular, we find a positive relationship between the number of investments and the target industry's concentration differential (between origins and destinations). This result is robust to the inclusion of various control variables driving the cross-border VC investments as identified by prior literature. We also verify the robustness of this result with the alternative model specifications.

The remainder of the paper is structured as follows: Section 2 discusses the data and its collection process; Section 3 reports the results; Section 4 concludes.

2. Data

The raw data is sourced from the Reuters Eikon[3] database, which collects the information on VC investment rounds worldwide. We collected this data in early 2017, thus the cutoff date is December 31^{st}, 2016. For each investment we observe the country of the target (destination) and the country of every investor involved in a deal (origin). Since we focus on the industry characteristics we also record the industry of the target (via the 2 digit SIC code), and finally the year of the transaction. Aggregating this information at the origin-destination-industry-year level gives us the tetrad data structure used in our analyses. Note that the same country can be recorded twice, first as an origin and second as a destination depending on the direction of the investment flow.

We construct two different samples. The first one, hereafter referred to the as non-zero-boost sample (NZB sample), collects tetrads in which cross-border investments are recorded. The second sample, hereafter referred to as the zero-boost sample (ZB sample),

[3]Historically, Reuters commercialized this database under the VentureXpert, VentureOne, Venture Economics or Thomson One names.

includes in addition the tetrads in which there are no investments. In this sample, we start recording the cross-border VC activity at the origin-destination level starting the year of the first investment. We see the first deal between a pair of countries as an objective proof of feasibility of such an activity.

Our rationale for using two samples is the following. NZB sample is similar (but more granular) to the one used by Frésard et al. (2017) who collapsed all years into the origin-destination-industry structure. Since we do not collapse the years, the exclusion of periods with no investment activity may bias our results. To account for this, we use the ZB sample that keeps years with no activity in the origin-destination-industry triads. This approach is also consistent with Schertler and Tykvová (2011, 2012) although they use the origin-destination-years structure (excluding the industries).

In both samples we track the number of investments by industry and by year from the origin to the destination. This is our main dependent variable.

Number of deals present several methodological challenges. For instance, more investment rounds could be required to nurture target companies in some countries than others. Accordingly, the deal count will overstate the deal flow. Relatedly, syndicated cross-border investments with several international partners (e.g., a US target receiving funding from British and French investors) must also be counted as one deal for each of the VCFs, thus inflating the count[4]. To alleviate these concerns, we also used the aggregate transaction volume (in millions of 2015 US dollars). We compute it in two steps: first we aggregate the amounts invested by each VCF in a given deal, and then aggregate the deal amounts at country-industry-year levels. This aggregation is robust to the above-mentioned multinational syndicate concern as VCFs' individual stakes add up to the deal size. However, we note that the coverage and the accuracy of the transaction amounts in Reuters Eikon is far from perfect (Kaplan & Lerner, 2016). For this reason, we regard this variable as an alternative to the number of investments.

To measure industry concentration we compute the Herfindahl-Hirschman index (HHI) at each country-industry-year level for origins and destinations[5]. The index is based on the annual financial data retrieved from Worldscope. The latter provides financial information on listed firms in each country and each 2 digits SIC code present in our sample[6]. From the HHI perspective, more concentrated, and hence more monopolistic industries tend to obtain higher values of the index. As HHI relies on the listed firms' data, the size of the capital markets (in terms of number of listed entities) in a given country-industry-year clearly matters. We therefore follow Frésard et al. (2017) and require at least three listed firms in a given country-industry-year and drop all observations that do not satisfy this restriction.

Prior literature has identified a number of other factors that affect the cross-border investment activity. Accordingly, we include in the analyses the economic, institutional, and cultural control variables discussed below.

First, we compute the specialization index (SPI) to capture another possible dimension of the difference in industrial structures between the origins and destinations. Frésard

[4]This approach is identical to Schertler and Tykvová (2012).

[5]HHI is widely used by anti-trust authorities as a trigger for further investigations. For example, the US Department of Justice uses the HHI to measure the effects of a particular merger on the market competition. The European Commission regards the variation of the HHI measure of one industry as a trigger for further anti-trust investigations.

[6]This approach is identical to Frésard et al. (2017).

et al. (2017) shows that differences in SPI affect the cross-country M&A capital flows. SPI is based on the formulation of Balassa (1965) and tracks the share of a given industry in a country's total production (based on firms' net sales) relative to the average share of this same industry worldwide. Intuitively, the SPI captures the degree of specialization by comparing prevalent industries *between* countries. Second, we account for the intensity of economic ties between origins and destinations with bilateral trade from UNComtrade database. Third, we control for the existence of bilateral tax and investment treaties with the in-force status. We collect these variables from the UNCTAD Investment Policy Hub and International Bureau of Fiscal Documentation. Fourth, we also check for the origins' and destinations' VC industry maturity with the total size of their local VC markets as a percentage of respective GDPs. The data for this variable is retrieved from Reuters Eikon and World Bank. Fifth, the flow of cross-border investments can also be affected by how much people from different countries trust one another (Ahern et al., 2015; Bottazzi et al., 2016). We control for the distance in trust between the origins and destinations based on the trust measure proposed by Ahern et al. (2015). The data comes from the World Value Survey project. Sixth, taxes can also become a factor of cross-border investments, especially in VC setup where investors expect large payoffs generated through exits from targets that have grown rapidly (Gompers & Lerner, 2004). We therefore incorporate in our analyses the profit tax rate data item available in World Bank Doing Business database. Seventh, Nahata et al. (2014) and Guler and Guillén (2010b) showed that VC investments rely on countries' institutional characteristics. Accordingly, we also include the Investor Protection Index compiled by the World Bank Doing Business database[7] in the analyses. Eighth, the literature identified that differences in (i) expected GDP growth rates (Schertler & Tykvová, 2011), (ii) depth the stock markets (Groh et al., 2010; Aizenman & Kendall, 2012), and (iii) exit market conditions (Bertoni & Groh, 2014) all play a role in explaining the variation of the cross-border VC activity. The expected growth rates and stock market returns are sourced from Datastream. Stock market capitalization is recovered from World Bank World Development indicators. Finally, both Aizenman and Kendall (2012) and Schertler and Tykvová (2012) identify how the target countries' technological innovation impact on the intensity of cross-border VC activity. Therefore, to account for the extent of innovation at destinations we augment our models with a per country patent applications retrieved from IMD World Competitiveness database.

Table 1 presents the detailed definitions and sources for each data item. The descriptive statistics are provided in Table 2.

[7]In our prior analyses we also used Corruption Perception Index from Transparency International, and a series of other indices from the World Bank Doing Business, namely Legal Rights, Conflict of Interest Regulation, and Shareholder Governance indices. The use of all of these variables yielded very similar results to the ones presented here.

Table 1: Definition of variables

Variable name	Units	Definition
Number (N)	Count	The total number of VC investment decisions by foreign VCFs (i.e. from the origin) flowing to local (i.e. to the destination) target companies in a given industry-year. *Source: Reuters Eikon.*
Volume (V)	Millions of constant USD	The overall amount of equity invested by all VC firms from an origin country flowing into a destination country-industry-year. Expressed in millions of 2015 US dollars. *Source: Reuters Eikon.*
HHI[a]	-	Sum of squared market shares (based on firms' net sales) of all listed firms in a given country-industry-year. *Source: Worldscope.*
SPI[a]	-	Country industry specialization index as proposed by Frésard et al. (2017). *Source: Worldscope.*
Bilateral trade[c]	Billions of constant USD	Sum of bilateral imports and exports (in constant USD) between the country pairs. Available since 1980. *Source: UN-Comtrade / World Integrated Trade Solution (WITS).*
Double taxation treaty (DTT)	Dummy	Dummy variable indicating if a country pair has a bilateral taxation treaty in force during the whole year. Available since 1980. *Source: IBFD Tax Research Platform.*
Bilateral investment treaty (BIT)	Dummy	Dummy variable indicating if a country pair has a bilateral investment treaty in force during the whole year. Available since 1980. *Source: UNCTAD Investment Policy Hub.*
Trust[a]	Proportion	Proportion of people answering "most people can be trusted" to question A165 in the total of the people surveyed. Available since 1980. *Source: World and European Value Surveys.*
VC investments[a]	% of GDP	Ratio of the amount venture capital and private equity investments to the GDP of a country in a focal year. Available since 1980. *Source: Reuters Eikon and World Bank.*
Tax rate[a]	%	Amount of taxes on profits paid by a business as a share of commercial profits. Available since 2005. *Source: World Bank Doing Business.*
Investor protection[a]	Index	Aggregated index of Corporate Governance, as the simple average of Conflict of Interest Regulation Index and Shareholder Governance Index. This index ranges from 0 to 10, higher scores representing better protection. Available since 2005. *Source: World Bank Doing Business.*
GDP growth rate[b]	%	Expected Real Growth Rate of the Gross Domestic Product of the country for the next 3-5 years. Available since 1980. *Source: Datastream.*
Stock market cap[a]	% of GDP	Ratio of the stock market capitalization to the country GDP. Available since 1980. Source: *World Bank World Development Indicators.*
Stock market returns[a]	%	Total return of the Total Market Index for the year. Available since 1980. *Source: Datastream.*
Patents[c]	Number per million of capita	Ratio of the number of patents applications per million of capita in the destination country in the focal year. Available since 1995. This variable is lagged one year in all analyzes. *Source: IMD World Competitiveness Index Panel - scientific infrastructure.*

[a] This variable is used as a difference between the origin and destination and is one year lagged with respect to the dependent variables in all analyses.

[b] This variable is used as a difference between the origin and destination in all analyses.

[c] This variable is lagged one year with respect to the dependent variables in all analyses.

Table 2: Descriptive statistics

Panel A describes the non-zero-boost sample, which covers only years in which investments are recorded. Panel B describes the zero-boost sample, which also includes the years with no investments. All variables prefixed with Δ refer to the differences between the origins and destinations countries. For the variable definitions refer to Table 1. **Q1**, **Q5**, and **Q9** refer to the first decile, the median, and the ninth decile respectively. The last two columns report the availability of each data item.

Variable	Mean	Q1	Q5	Q9	SD	N	Availability
Panel A: non-zero-boost sample (NZB)							
Dependent variables							
Number	2.383	1.000	1.000	4.000	4.907	18,398	1980-2016
Volume ($m)	12.869	0.000	2.665	26.212	49.443	18,398	1980-2016
Tetrad level							
ΔHHI	0.016	−0.345	0.008	0.409	0.303	13,835	1981-2016
ΔSPI	0.030	−1.440	0.005	1.535	1.633	17,136	1981-2016
Dyad level							
Bilateral trade ($bn)	29.926	0.604	9.607	75.232	60.797	6,609	1980-2016
Δ Trust	0.016	−0.253	0.013	0.281	0.198	6,530	1980-2016
Δ VC investments (%GDP)	0.046	−0.232	0.002	0.239	2.714	6,274	1981-2016
Δ Tax rate (%)	−0.928	−17.200	−0.900	15.500	12.058	3,990	2006-2016
Δ Investor protection	0.026	−3.000	0.000	3.000	2.229	3,990	2006-2016
Δ GDP growth rate (%)	−0.348	−2.700	−0.200	1.800	1.926	6,024	1990-2016
Δ Stock market cap (%GDP)	0.218	−0.907	0.135	1.243	1.637	6,169	1980-2016
Δ Stock market returns (%)	−0.010	−0.233	0.000	0.224	0.258	6,968	1980-2016
Destination level							
Patents (per 10^6 of capita)	86.514	1.315	23.411	241.259	119.055	649	2004-2016
Panel B: zero-boost sample (ZB)							
Dependent variables							
Number	0.579	0.000	0.000	1.000	2.624	75,797	1980-2016
Volume ($m)	3.124	0.000	0.000	4.067	24.976	75,797	1980-2016
Tetrad level							
ΔHHI	−0.009	−0.399	−0.011	0.396	0.313	51,507	1981-2016
ΔSPI	−0.007	−1.427	0.000	1.423	1.805	68,072	1981-2016
Dyad level							
Bilateral trade ($bn)	17.159	0.165	4.176	41.687	43.005	16,077	1980-2016
Δ Trust	0.033	−0.253	0.032	0.304	0.214	14,958	1980-2016
Δ VC investments (%GDP)	0.024	−0.212	0.006	0.230	2.694	14,124	1981-2016
Δ Tax rate (%)	−0.501	−16.700	−0.200	15.300	11.942	11,312	2006-2016
Δ Investor protection	0.211	−2.700	0.200	3.190	2.229	11,312	2006-2016
Δ GDP growth rate (%)	−0.305	−2.600	−0.200	2.000	1.944	13,636	1990-2016
Δ Stock market cap (%GDP)	0.254	−0.905	0.166	1.263	1.808	14,300	1980-2016
Δ Stock market returns (%)	−0.009	−0.222	0.000	0.207	0.239	16,869	1980-2016
Destination level							
Patents (per 10^6 of capita)	72.990	0.850	16.037	226.009	111.671	795	2004-2016

As shown in Table 1, most of the macroeconomic data is available starting 1980, an exception being the World Bank Doing Business data, which are documented since 2005. Because of this, our analyses are performed on samples spanning either 1981-2016 or 2006-2016 years (this is also indicated in the headers of the tables). In addition, the missing information in many of the variables discussed above is also an issue. The implication is that samples, on which the models are estimated, vary depending on the specifications.

Our baseline specifications (without World Bank controls) build on 67 distinct countries, which are broken down into about 50 origins, about 62-66 destinations. In the

specifications that include World Bank Doing Business data these counts are of about 45, 45-47, 48-51 for distinct countries, origins, and destinations[8]. Note that beyond the minimum number of listed firms in a country-industry-year and data availability issues discussed above, we do not exclude any other country or observation from the analyses. The complete list of countries, industries, and years used in our analyses is reported in Tables A, B, and C in the Appendix.

The following statistics illustrate the number of observations per country-industry-year in zero-boost and non-zero-boost samples. At the destination country level in the ZB sample, the average number of distinct industries across all years and all origins is 16.68 (median of 11.0 and SD of 16.28). Restricting this to the NZB sample, we are dealing with an average of 15.74 different industries (median of 10.5 and SD of 15.77). At the same time, the average number of destinations across all SIC2 industries and years in the ZB sample is 16.94 (median of 14.0 and SD of 11.76); the average number of destinations across all SIC2 industries and years in the NZB sample is 15.23 (median of 12.5 and SD of 10.93).

Table D in the Appendix also illustrates the kind of information we observe in a directional triad (origin-destination-industry) level. In NZB sample (Panel A), an average triad is observed over about 3 years (2.993) making about 7 investments in total (7.133) or 1.295 investment per year. In this setting, an average triad has a total investment flow of about $38.5m or about $9m per year. In the ZB sample (Panel B), an average triad is observed over about twelve (12.329) years, with about ten (10.005) years with no investment activity in terms of numbers and slightly more (10.504 on average) in terms of volumes. Investors seem to make on average 7 cross-border deals per industry (or around 0.482 per year). In terms of volumes, an average triad involves an investment flow from origin to destination into a typical industry of about $38.5m (the same as in the NZB sample) or about $3m per year.

3. Empirical Design and Results

Our goal is to verify whether the differences in HHI are related to the number of cross-border VC transactions. The tetrad data structure allows testing for this using the fixed effect specifications. We thus include country pair (origin-destination) fixed effect, industry fixed effect, and year fixed effect in all models. In particular, origin-destination pair fixed effects conveniently clear the constant over time cross-country unobserved heterogeneity concerns. To reduce the risk of reverse causality, we follow Schertler and Tykvová (2011, 2012) and use lags (indexed as $t-1$) of the independent variables whenever necessary. Table 3 provides the estimates.

We estimate eight model specifications. Models (1) to (4) are based on the non-zero-boost sample, while models (5) to (8) are estimated on the larger sample that includes the years with no activity (zero-boost sample). Odd-numbered models exclude the variables with a considerable amount of missing data, while even-numbered models include them (hence the change in the number of observations). The dependent variable in the models (1), (2), (5), and (6) is the number of investments, while the remaining models use

[8]We provide approximate figures because the exact counts depend on the models and sample used. See also Table 3.

Table 3: Main results

The table collects the results of the fixed effect linear models at the tetrad observation level (origin-destination-industry-year). Non-zero-boost sample covers the years in which investments are recorded. Zero-boost sample includes the years with no investments. Prefix Δ denotes the differences between the origins and destinations. Postfixes t and $t-1$ denote contemporaneous and lagged measures. Table 1 provides the variable definitions. All models include the country pair, industry, and time fixed effects. Odd-indexed models (1, 3, 5, 7) run on a sample covering years 1981-2016, even-indexed models (2, 4, 6, 8) run on the sample spanning 2006-2016. Standard errors are clustered at the country pair (origin-destination) level and are reported in parentheses.

	Non-zero-boost sample				Zero-boost sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number $\ln(1+N)$	Number $\ln(1+N)$	Volume $\ln(1+V)$	Volume $\ln(1+V)$	Number $\ln(1+N)$	Number $\ln(1+N)$	Volume $\ln(1+V)$	Volume $\ln(1+V)$
Panel A: whole sample.								
Ln(1+ΔHHI)$_{t-1}$	0.07***	0.04**	−0.06	−0.04	0.06***	0.04***	0.06**	0.05**
	(0.02)	(0.02)	(0.05)	(0.06)	(0.02)	(0.01)	(0.03)	(0.03)
ΔSPI$_{t-1}$	0.00	0.00	−0.00	−0.01	−0.00	−0.00	−0.00	−0.00
	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.01)	(0.01)
Ln(1+Bilateral trade)$_{t-1}$	0.22***	0.18***	0.32***	0.29*	0.08**	−0.02	0.11*	−0.06
	(0.06)	(0.06)	(0.09)	(0.15)	(0.04)	(0.03)	(0.06)	(0.08)
DTT	0.02	−0.03	−0.23**	−0.28	0.04*	0.02	0.00	0.01
	(0.05)	(0.05)	(0.11)	(0.17)	(0.02)	(0.02)	(0.04)	(0.05)
BIT	−0.10	−0.13	−0.17	0.44	0.04	0.07	0.06	0.27
	(0.06)	(0.14)	(0.30)	(0.44)	(0.04)	(0.07)	(0.09)	(0.18)
ΔTrust$_{t-1}$	0.09	0.02	−0.04	−0.32**	0.10**	0.07*	0.11	0.02
	(0.07)	(0.08)	(0.12)	(0.15)	(0.05)	(0.04)	(0.07)	(0.07)
ΔVC investments$_{t-1}$	−0.06***	−0.02	−0.05	0.02	−0.06***	−0.03**	−0.07**	−0.03
	(0.02)	(0.02)	(0.06)	(0.04)	(0.02)	(0.01)	(0.03)	(0.02)
ΔTax rate$_{t-1}$		−0.15*		0.15		−0.18***		−0.22**
		(0.07)		(0.22)		(0.06)		(0.11)
ΔInvestor protection$_{t-1}$		−0.02**		−0.02		−0.01**		−0.01
		(0.01)		(0.01)		(0.00)		(0.01)
ΔGDP growth rate$_t$		−0.02***		−0.02		−0.01***		−0.02**
		(0.01)		(0.02)		(0.01)		(0.01)
ΔStock market cap$_{t-1}$		0.02***		0.04***		0.01***		0.02***
		(0.00)		(0.01)		(0.00)		(0.01)
ΔStock market returns$_{t-1}$		−0.00		−0.28***		−0.02		−0.12***
		(0.03)		(0.09)		(0.01)		(0.04)
Ln(1+Patents)$_{t-1}$		−0.03		−0.10**		−0.02*		−0.06**
		(0.02)		(0.04)		(0.01)		(0.02)
Adjusted R^2	0.34	0.38	0.20	0.19	0.28	0.29	0.20	0.21
F statistic	12.91***	9.91***	6.58***	4.46***	29.77***	22.09***	19.96***	14.80***
Observations	13,181	6,676	13,181	6,676	47,894	28,197	47,894	28,197
N. origins / destinations	50 / 62	45 / 48	50 / 62	45 / 48	50 / 66	47 / 51	50 / 66	47 / 51
Panel B: Sample excluding US-destined investments.								
Ln(1+ΔHHI)$_{t-1}$	0.07***	0.06**	0.03	0.05	0.06***	0.06***	0.08***	0.08***
	(0.02)	(0.03)	(0.05)	(0.07)	(0.01)	(0.01)	(0.02)	(0.03)
ΔSPI$_{t-1}$	0.01*	0.01	−0.00	−0.00	0.01*	0.00	0.00	0.00
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Ln(1+Bilateral trade)$_{t-1}$	0.14***	0.04	0.13*	0.16	0.05	−0.07***	0.05	−0.13*
	(0.05)	(0.05)	(0.07)	(0.17)	(0.03)	(0.03)	(0.05)	(0.07)
DTT	−0.01	0.00	−0.38***	−0.34**	0.02	0.01	−0.03	−0.01
	(0.05)	(0.06)	(0.11)	(0.16)	(0.02)	(0.01)	(0.03)	(0.04)
BIT	−0.05	−0.07	−0.08	0.55	0.05*	0.07	0.08	0.27
	(0.05)	(0.11)	(0.30)	(0.44)	(0.03)	(0.05)	(0.09)	(0.17)
ΔTrust$_{t-1}$	−0.03	−0.03	−0.18*	−0.29*	0.03	0.01	0.01	−0.04
	(0.06)	(0.05)	(0.11)	(0.17)	(0.04)	(0.03)	(0.06)	(0.07)
ΔVC investments$_{t-1}$	−0.00	0.01	0.03	0.04	−0.03***	−0.01	−0.03	−0.01
	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.02)	(0.02)
ΔTax rate$_{t-1}$		−0.05		0.33		−0.04		−0.02
		(0.08)		(0.27)		(0.05)		(0.11)
ΔInvestor protection$_{t-1}$		0.00		0.01		−0.00		0.00
		(0.00)		(0.01)		(0.00)		(0.01)
ΔGDP growth rate$_t$		−0.01		0.00		−0.01**		−0.01
		(0.01)		(0.02)		(0.00)		(0.01)
ΔStock market cap$_{t-1}$		0.01***		0.03**		0.01**		0.01*
		(0.00)		(0.01)		(0.00)		(0.01)
ΔStock market returns$_{t-1}$		−0.01		−0.25***		−0.04**		−0.14***
		(0.03)		(0.09)		(0.02)		(0.04)
Ln(1+Patents)$_{t-1}$		−0.01		−0.06		−0.01		−0.03
		(0.02)		(0.05)		(0.01)		(0.02)
Adjusted R^2	0.29	0.33	0.18	0.18	0.23	0.25	0.17	0.18
F statistic	8.08***	6.46***	4.77***	3.43***	19.84***	15.78***	13.51***	10.81***
Observations	9,780	5,037	9,780	5,037	39,155	23,635	39,155	23,635
N. origins / destinations	46 / 61	41 / 47	46 / 61	41 / 47	47 / 65	43 / 50	47 / 65	43 / 50

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

investment volumes as a response.

The results of Panel A show that the industry concentration differentials load positively on the number of cross-border VC investments in all corresponding models, i.e. models (1), (2), (5), and (6). Moreover, the coefficients of ΔHHI in this case are statistically significant at 1% or 5% levels and survive the inclusion of additional controls. In addition, we observe that the order of magnitude remains similar regardless whether we estimate the models on the ZB or the NZB sample. The parameter estimate of the ΔHHI in model (1) is of 0.07 and is very close to the 0.06-valued estimate in model (5). The parameter estimates in models (2) and (6) are very similar as well (in fact both are of 0.04). This suggests that our results are not driven by the inclusion/exclusion of the years in which no cross-border activity is recorded.

We do not find any statistically significant relationship between the industry concentration differentials and the investment volumes in the NZB sample (models (3) and (4)). The picture is different in the sample that includes the years with no VC activity. In models (7) and (8) the ΔHHI loading is positive, significant at 5% level. Note that both the response and the ΔHHI variables are log-transformed so our estimates indicate that for 1% change in the industry concentration differentials the responses covary by roughly 5.5% (simple average between the min and max values of parameter estimates).

Prior literature (e.g. Aizenman and Kendall (2012)) as well as our own data, indicate that investments are heavily clustered in the US. This clustering has two reasons. The first one is the objective size and maturity of the US venture capital industry - it is the oldest (in a formal way, see also Hsu and Kenney (2005)) and largest in the world. The second is due to Reuters Eikon's potential bias towards US investments. To verify that our results are not affected by these considerations we re-estimated the same models on samples that exclude the US-destined investments. Panel B of Table 3 suggests that the identified positive associations between the industry concentration differentials and investment numbers and/or volumes survive this restriction as well - the results are very similar to the ones in Panel A.

Finally we note that the fixed effect estimator is not the best suited one to analyze one of our response variables, namely the number of deals. As such, we also run an alternative estimation using the count data models as in Schertler and Tykvová (2011). In particular, models (1), (2), (5), and (6) of Table 4 present the estimates using the negative binomial estimator. It is applied to the NZB sample and is needed to account for over-dispersion in the counts. Models (3), (4), (7), and (8) make use of the zero-inflated negative binomial estimator, which is applied to the ZB sample and accounts for the excessive presence of zero counts. We present the results for the samples that with and without US-destined investments. The estimation method notwithstanding, we still observe the positive and statistically significant association between the industry concentration differentials and the number of cross-border VC deals in all samples and across all models.

4. Conclusions

This paper focuses on the patterns of cross-border VC investments in relation to the differences in target industry concentration at the investor (origin) and investee (destination) countries. Our results can be summarized as follows. We find that industry concentration differentials and the cross-border VC investment flows (in terms of number

Table 4: Count data models

The table collects the results of negative binomial (1-2-5-6) and zero-inflated negative binomial (3-4-7-8) specifications at the tetrad observation level (origin-destination-industry-year). Non-zero-boost sample covers the years in which investments are recorded. Zero-boost sample includes the years with no investments. Prefix Δ denotes the differences between the origins and destinations. Postfixes t and $t-1$ denote contemporaneous and lagged measures. Table 1 provides the variable definitions. All models include the country pair, industry, and time fixed effects. Odd-indexed models (1, 3, 5, 7) run on a sample covering years 1981-2016, even-indexed models (2, 4, 6, 8) run on the sample spanning 2006-2016. Standard errors are reported in parentheses.

	Whole sample				Excluding US destination			
	Non-zero-boost		Zero-boost		Non-zero-boost		Zero-boost	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number	Number	Number	Number	Number	Number	Number	Number
$\text{Ln}(1+\Delta\text{HHI})_{t-1}$	0.15^{***}	0.09^{**}	0.25^{***}	0.18^{***}	0.15^{***}	0.12^{***}	0.26^{***}	0.24^{***}
	(0.02)	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)	(0.05)
ΔSPI_{t-1}	0.00	0.01	0.01^{*}	0.01	0.02^{**}	0.02	0.02^{***}	0.02^{*}
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
$\text{Ln}(1+\text{Bilateral trade})_{t-1}$	0.56^{***}	0.41^{***}	0.48^{***}	-0.08	0.40^{***}	0.11	0.39^{***}	-0.43^{***}
	(0.04)	(0.08)	(0.05)	(0.10)	(0.05)	(0.10)	(0.05)	(0.11)
DTT	0.12^{*}	-0.05	0.11	0.02	-0.03	-0.02	-0.05	-0.02
	(0.07)	(0.09)	(0.07)	(0.10)	(0.08)	(0.12)	(0.09)	(0.12)
BIT	-0.27	-0.34	0.11	0.51	-0.20	-0.26	0.19	0.48
	(0.17)	(0.27)	(0.19)	(0.32)	(0.17)	(0.27)	(0.18)	(0.31)
ΔTrust_{t-1}	0.13^{***}	-0.02	0.28^{***}	0.18^{**}	-0.14^{**}	-0.07	0.00	0.01
	(0.05)	(0.08)	(0.06)	(0.09)	(0.07)	(0.12)	(0.08)	(0.12)
$\Delta\text{VC investments}_{t-1}$	-0.15^{***}	-0.05	-0.21^{***}	-0.12^{***}	-0.02	0.00	-0.15^{***}	-0.05
	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
$\Delta\text{Tax rate}_{t-1}$		-0.24^{**}		-0.61^{***}		-0.12		-0.15
		(0.11)		(0.12)		(0.17)		(0.18)
$\Delta\text{Investor protection}_{t-1}$		-0.04^{***}		-0.04^{***}		0.00		-0.02^{**}
		(0.01)		(0.01)		(0.01)		(0.01)
$\Delta\text{GDP growth rate}_{t}$		-0.05^{***}		-0.08^{***}		-0.02		-0.05^{***}
		(0.01)		(0.01)		(0.01)		(0.01)
$\Delta\text{Stock market cap}_{t-1}$		0.05^{***}		0.07^{***}		0.04^{***}		0.06^{***}
		(0.01)		(0.01)		(0.01)		(0.01)
$\Delta\text{Stock market returns}_{t-1}$		0.03		-0.05		0.01		-0.05
		(0.05)		(0.06)		(0.05)		(0.06)
$\text{Ln}(1+\text{Patents})_{t-1}$		-0.06^{***}		-0.08^{***}		0.01		0.03
		(0.02)		(0.03)		(0.03)		(0.04)
Log(Theta)			-0.07^{***}	0.18^{***}			0.03	0.26^{***}
			(0.02)	(0.04)			(0.03)	(0.05)
Log Likelihood	-23801.76	-11726.27	-40508.27	-20478.04	-15861.80	-8126.53	-29188.34	-15129.60
Observations	13181	6676	47894	28197	9780	5037	39155	23635

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

of investments) from investor to target countries are positively related. This results holds in samples with and without zero-investment activity years. Moreover, the documented positive association seems to be robust to (i) the inclusion of various control variables identified by the prior literature, (ii) inclusion/exclusion of the US-destined investments, and (iii) alternative estimation methods. We see some evidence that a similar positive relationship may exist for investment volumes, although this result must be taken with caution given the quality of the investment volume reporting (Kaplan & Lerner, 2016).

References

Ahern, K. R., Daminelli, D., & Fracassi, C. (2015). Lost in translation? the effect of cultural values on mergers around the world. *Journal of Financial Economics*, *117*(1), 165–189.

Aizenman, J., & Kendall, J. (2012). The internationalization of venture capital. *Journal of Economic Studies*, *39*(5), 488–511.

Alhorr, H. S., Moore, C. B., & Payne, G. T. (2008). The impact of economic integration on cross–border venture capital investments: Evidence from the european union. *Entrepreneurship Theory and Practice*, *32*(5), 897–917.

Balassa, B. (1965). Trade liberalisation and "revealed" comparative advantage. *The Manchester School*, *33*(2), 99–123.

Bertoni, F., & Groh, A. P. (2014). Cross-border investments and venture capital exits in europe. *Corporate Governance: An International Review*, *22*(2), 84–99.

Bottazzi, L., Rin, M. D., & Hellmann, T. (2016). The importance of trust for investment: Evidence from venture capital. *Review of Financial Studies*, *29*(9), 2341–2386.

Devigne, D., Manigart, S., Vanacker, T., & Mulier, K. (2018). Venture capital internationalization: Synthesis and future research directions. *Journal of Economic Surveys*, *32*(5), 1414–1445.

Ewens, M., & Rhodes-Kropf, M. (2015). Is a VC partnership greater than the sum of its parts? *Journal of Finance*, *70*(3), 1081–1113.

Frésard, L., Hege, U., & Phillips, G. (2017). Extending industry specialization through cross-border acquisitions. *Review of Financial Studies*, *30*(5), 1539–1582.

Gompers, P., & Lerner, J. (2004). *Venture capital cycle* (2nd ed.). The MIT Press, Cambridge, Massachusetts, London, England.

Gompers, P., Kovner, A., & Lerner, J. (2009). Specialization and sucess: Evidence from venture capital. *Journal of Economics and Management Strategy*, *18*(3), 817–844.

Groh, A. P., von Liechtenstein, H., & Lieser, K. (2010). The european venture capital and private equity country attractiveness indices. *Journal of Corporate Finance*, *16*(2), 205–224.

Guler, I., & Guillén, M. F. (2010a). Home country networks and foreign expansion: Evidence from the venture capital industry. *Academy of Management Journal*, *53*(2), 390–410.

Guler, I., & Guillén, M. F. (2010b). Institutions and the internationalization of us venture capital firms. *Journal of International Business Studies*, *41*(2), 185–205.

Hou, K., & Robinson, D. T. (2006). Industry Concentration and Average Stock Returns. *The Journal of Finance*, *61*(4), 1927–1956.

Hsu, D. H., & Kenney, M. (2005). Organizing venture capital: the rise and demise of American Research & Development Corporation, 1946–1973. *Industrial and Corporate Change*, *14*(4), 579–616.

Hull, T. J. (2017). *The effect of venture capitalists straying from their industry comfort zones*. Working paper.

Kaplan, S. N., & Lerner, J. (2016). *Venture capital data: Opportunities and challenges*. NBER working paper.

Madhavan, R., & Iriyama, A. (2009). Understanding global flows of venture capital: Human networks as the "carrier wave" of globalization. *Journal of International Business Studies*, *40*(8), 1241–1259.

Nahata, R., Hazarika, S., & Tandon, K. (2014). Success in global venture capital investing: Do institutional and cultural differences matter? *Journal of Financial and Quantitative Analysis*, *49*(4), 1039–1070.

Rhoades, S. A. (1993). *The Herfindahl-Hirschman Index* (Tehcinal note). Federal Reserve Bank of St. Louis.

Schertler, A., & Tykvová, T. (2011). Venture capital and internationalization. *International Business Review*, *20*(4), 423–439.

Schertler, A., & Tykvová, T. (2012). What lures cross-border venture capital inflows? *Journal of International Money and Finance*, *31*(6), 1777–1799.

Appendix

Table A: Sample composition by countries

The table presents the sample's country composition and the corresponding deal activity and investment volumes. All monetary data is in constant 2015 US dollars. Missing volume figures are dashed.

		Outgoing deals				Incoming deals			
ISO3	Country	Number	%	Volume ($m)	%	Number	%	Volume ($m)	%
ARG	Argentina	24	0.06	34.74	0.02	107	0.25	661.09	0.29
AUS	Australia	796	1.88	2,866.58	1.25	327	0.76	1,552.62	0.68
AUT	Austria	117	0.28	159.15	0.07	263	0.61	1,198.02	0.52
BEL	Belgium	665	1.57	2,906.30	1.27	312	0.73	3,894.51	1.70
BGR	Bulgaria	10	0.02	13.32	0.01	17	0.04	109.37	0.05
BRA	Brazil	55	0.13	306.53	0.13	296	0.69	2,634.51	1.15
CAN	Canada	2,845	6.72	8,879.63	3.87	2,444	5.69	9,711.73	4.24
CHE	Switzerland	2,038	4.82	7,152.05	3.11	697	1.62	3,130.03	1.37
CHL	Chile	16	0.04	25.84	0.01	33	0.08	112.30	0.05
CHN	China	601	1.42	4,826.18	2.10	3,655	8.51	38,421.42	16.78
COL	Colombia	2	0.00	-	-	16	0.04	57.40	0.03
CYP	Cyprus	10	0.02	14.41	0.01	19	0.04	79.64	0.03
CZE	Czech Republic	70	0.17	142.09	0.06	59	0.14	399.52	0.17
DEU	Germany	2,523	5.96	9,072.62	3.95	1,954	4.55	7,142.90	3.12
DNK	Denmark	666	1.57	2,091.25	0.91	405	0.94	2,015.93	0.88
EGY	Egypt	7	0.02	81.27	0.04	38	0.09	111.90	0.05
ESP	Spain	243	0.57	621.10	0.27	360	0.84	2,149.32	0.94
FIN	Finland	342	0.81	830.94	0.36	393	0.91	1,275.09	0.56
FRA	France	1,642	3.88	6,469.43	2.82	1,658	3.86	7,002.06	3.06
GBR	United Kingdom	6,336	14.97	25,118.81	10.93	3,363	7.83	18,994.55	8.29
GHA	Ghana	1	0.00	-	-	19	0.04	30.40	0.01
GRC	Greece	23	0.05	59.22	0.03	6	0.01	1.70	0.00
HKG	Hong Kong	1,725	4.08	18,110.14	7.88	299	0.70	3,450.24	1.51
HUN	Hungary	14	0.03	38.15	0.02	77	0.18	287.30	0.13
IDN	Indonesia	17	0.04	26.27	0.01	131	0.30	1,134.21	0.50
IND	India	257	0.61	1,073.14	0.47	2,133	4.96	19,979.65	8.72
IRL	Republic of Ireland	293	0.69	745.12	0.32	469	1.09	3,337.99	1.46
ISR	Israel	1,269	3.00	4,855.25	2.11	1,293	3.01	5,931.06	2.59
ITA	Italy	168	0.40	447.26	0.19	261	0.61	1,969.62	0.86
JOR	Jordan	37	0.09	12.17	0.01	26	0.06	621.56	0.27
JPN	Japan	1,428	3.37	7,777.71	3.39	476	1.11	2,130.19	0.93
KAZ	Kazakhstan	0	0.00	-	-	10	0.02	154.77	0.07
KOR	South Korea	378	0.89	1,437.57	0.63	289	0.67	3,959.34	1.73
KWT	Kuwait	35	0.08	84.32	0.04	1	0.00	21.70	0.01
LBN	Lebanon	36	0.09	35.04	0.02	12	0.03	106.14	0.05
LTU	Lithuania	1	0.00	0.32	0.00	26	0.06	122.24	0.05
LUX	Luxembourg	408	0.96	1,625.74	0.71	73	0.17	1,764.99	0.77
LVA	Latvia	2	0.00	0.07	0.00	32	0.07	42.67	0.02
MAR	Morocco	2	0.00	0.33	0.00	7	0.02	60.22	0.03
MEX	Mexico	30	0.07	44.01	0.02	89	0.21	639.57	0.28
MLT	Malta	3	0.01	23.12	0.01	10	0.02	46.80	0.02
MYS	Malaysia	86	0.20	627.85	0.27	111	0.26	1,195.21	0.52
NGA	Nigeria	3	0.01	6.21	0.00	54	0.13	502.71	0.22
NLD	Netherlands	1,085	2.56	3,581.02	1.56	582	1.35	4,350.30	1.90
NOR	Norway	552	1.30	1,543.74	0.67	161	0.37	910.23	0.40
NZL	New Zealand	70	0.17	122.18	0.05	96	0.22	482.63	0.21
PAK	Pakistan	0	0.00	-	-	16	0.04	147.93	0.06
PER	Peru	1	0.00	-	-	16	0.04	38.33	0.02
PHL	Philippines	43	0.10	239.84	0.10	85	0.20	337.67	0.15
POL	Poland	99	0.23	453.23	0.20	110	0.26	306.21	0.13
PRT	Portugal	72	0.17	98.29	0.04	36	0.08	300.88	0.13
ROU	Romania	3	0.01	4.75	0.00	63	0.15	269.64	0.12
RUS	Russian Federation	434	1.03	5,554.53	2.42	202	0.47	1,163.57	0.51
SAU	Saudi Arabia	38	0.09	566.18	0.25	13	0.03	99.88	0.04
SGP	Singapore	1,419	3.35	11,498.65	5.01	527	1.23	3,529.54	1.54
SVK	Slovak Republic	7	0.02	-	-	21	0.05	66.13	0.03
SWE	Sweden	866	2.05	3,245.84	1.41	894	2.08	3,733.56	1.63
THA	Thailand	10	0.02	23.21	0.01	95	0.22	428.03	0.19
TUN	Tunisia	2	0.00	-	-	18	0.04	113.42	0.05
TUR	Turkey	5	0.01	11.82	0.01	59	0.14	144.33	0.06
TZA	Tanzania	0	0.00	-	-	19	0.04	161.57	0.07
UKR	Ukraine	33	0.08	27.19	0.01	24	0.06	167.93	0.07
USA	United States of America	12,259	28.97	93,274.63	40.60	17,508	40.74	63,470.60	27.72
VEN	Venezuela	0	0.00	-	-	2	0.00	0.93	0.00
VNM	Vietnam	13	0.03	8.75	0.00	36	0.08	210.39	0.09
ZAF	South Africa	86	0.20	844.95	0.37	63	0.15	406.11	0.18
ZMB	Zambia	0	0.00	-	-	5	0.01	20.75	0.01

Table B: Sample composition by industries

The table presents the sample's industry composition and the corresponding deal activity and investment volumes. All monetary data is in constant 2015 US dollars.

SIC2	Industry name	Number of deals	%	Volume of deals ($m)	%
01	Agricultural Production - Crops	4	0.01	33.10	0.01
02	Agricultural Production - Livestock and Animal Specialties	2	0.00	33.53	0.01
07	Agricultural Services	3	0.01	26.75	0.01
10	Metal Mining	53	0.12	191.44	0.08
12	Coal Mining	15	0.03	391.13	0.17
13	Oil and Gas Extraction	229	0.52	3,112.30	1.32
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels	21	0.05	95.69	0.04
15	Construction - General Contractors & Operative Builders	77	0.18	811.37	0.34
16	Heamy Construction, Except Building Construction, Contractor	87	0.20	789.42	0.33
17	Construction - Special Trade Contractors	47	0.11	86.09	0.04
20	Food and Kindred Products	385	0.88	3,264.85	1.38
22	Textile Mill Products	63	0.14	423.97	0.18
23	Apparel, Finished Products from Fabrics & Similar Materials	102	0.23	1,276.74	0.54
24	Lumber and Wood Products, Except Furniture	31	0.07	480.06	0.20
25	Furniture and Fixtures	50	0.11	117.87	0.05
26	Paper and Allied Products	81	0.19	1,012.51	0.43
27	Printing, Publishing and Allied Industries	347	0.79	1,500.96	0.64
28	Chemicals and Allied Products	4,651	10.63	19,081.16	8.07
29	Petroleum Refining and Related Industries	32	0.07	156.38	0.07
30	Rubber and Miscellaneous Plastic Products	104	0.24	1,163.05	0.49
31	Leather and Leather Products	40	0.09	143.21	0.06
32	Stone, Clay, Glass, and Concrete Products	154	0.35	995.49	0.42
33	Primary Metal Industries	184	0.42	955.13	0.40
34	Fabricated Metal Products	160	0.37	1,110.09	0.47
35	Industrial and Commercial Machinery and Computer Equipment	1,227	2.80	4,566.59	1.93
36	Electronic & Other Electrical Equipment & Components	4,531	10.35	17,316.54	7.33
37	Transportation Equipment	203	0.46	1,629.15	0.69
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	2,652	6.06	8,076.94	3.42
39	Miscellaneous Manufacturing Industries	133	0.30	299.09	0.13
40	Railroad Transportation	13	0.03	118.93	0.05
41	Local & Suburban Transit & Interurban Highway Transportation	21	0.05	30.03	0.01
42	Motor Freight Transportation	141	0.32	1,260.49	0.53
44	Water Transportation	47	0.11	449.01	0.19
45	Transportation by Air	59	0.13	511.10	0.22
47	Transportation Services	221	0.51	1,396.25	0.59
48	Communications	1,828	4.18	18,876.68	7.99
49	Electric, Gas and Sanitary Services	486	1.11	5,129.70	2.17
50	Wholesale Trade - Durable Goods	430	0.98	3,453.67	1.46
51	Wholesale Trade - Nondurable Goods	215	0.49	1,721.61	0.73
52	Building Materials, Hardware, Garden Supplies & Mobile Homes	24	0.05	61.70	0.03
53	General Merchandise Stores	53	0.12	1,472.17	0.62
54	Food Stores	100	0.23	818.94	0.35
55	Automotive Dealers and Gasoline Service Stations	31	0.07	152.52	0.06
56	Apparel and Accessory Stores	196	0.45	1,134.84	0.48
57	Home Furniture, Furnishings and Equipment Stores	112	0.26	437.57	0.19
58	Eating and Drinking Places	145	0.33	690.22	0.29
59	Miscellaneous Retail	1,020	2.33	7,540.91	3.19
60	Depository Institutions	234	0.53	3,893.69	1.65
61	Nondepository Credit Institutions	342	0.78	3,872.16	1.64
62	Security & Commodity Brokers, Dealers, Exchanges & Services	289	0.66	2,934.69	1.24
63	Insurance Carriers	128	0.29	2,907.33	1.23
64	Insurance Agents, Brokers and Service	68	0.16	802.25	0.34
65	Real Estate	212	0.48	2,116.33	0.90
67	Holding and Other Investment Offices	661	1.51	7,136.84	3.02
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	100	0.23	789.06	0.33
72	Personal Services	128	0.29	376.11	0.16
73	Business Services	16,781	38.35	76,680.04	32.45
75	Automotive Repair, Services and Parking	79	0.18	1,403.26	0.59
78	Motion Pictures	149	0.34	724.27	0.31
79	Amusement and Recreation Services	177	0.40	819.79	0.35
80	Health Services	538	1.23	3,465.36	1.47
82	Educational Services	276	0.63	1,688.87	0.71
83	Social Services	39	0.09	143.09	0.06
87	Engineering, Accounting, Research, and Management Services	2,591	5.92	11,319.00	4.79
89	Services, Not Elsewhere Classified	156	0.36	845.58	0.36

Table C: Sample composition by years

The table presents the sample's composition by years and the corresponding deal activity and investment volumes. All monetary data is in constant 2015 US dollars. Dyads stand for origin-destination couples while triads stand for origin-destination-industry triples.

	Total activity		Cross-border activity		Number of				
Year	Number	Volume ($m)	Number	Volume ($m)	Origins (O)	Destinations (D)	Industries (I)	Dyads (OD)	Triads (ODI)
1980	407	1,367.66	28	40.37	5	4	7	8	15
1981	661	2,242.39	70	133.14	10	4	18	14	41
1982	908	2,942.86	126	151.90	12	6	29	18	68
1983	1,230	5,278.90	198	317.73	12	9	35	21	96
1984	1,360	5,523.81	244	355.51	14	9	41	26	132
1985	1,316	4,934.15	221	343.82	16	10	45	30	151
1986	1,472	6,010.46	233	337.81	18	12	47	36	180
1987	1,743	6,592.82	201	523.41	19	12	49	42	210
1988	1,631	7,251.76	219	387.32	19	15	53	45	243
1989	1,696	6,192.94	211	438.19	21	21	57	58	279
1990	1,647	4,219.28	187	358.36	21	23	58	67	307
1991	1,495	3,816.09	148	642.61	21	26	58	72	336
1992	1,892	7,663.86	201	802.10	22	29	58	83	374
1993	1,794	6,542.22	196	775.32	25	31	58	102	423
1994	1,927	6,678.40	239	537.09	27	35	60	115	482
1995	2,428	10,515.48	318	1,174.82	28	41	62	135	566
1996	3,495	20,886.91	528	1,649.53	30	49	63	166	701
1997	4,274	18,981.94	589	1,950.19	32	51	66	192	839
1998	4,945	28,755.38	743	3,389.97	35	52	67	231	1,006
1999	6,580	63,790.33	1,313	10,580.68	39	53	67	312	1,328
2000	10,002	112,537.46	2,428	21,542.27	41	56	69	394	1,786
2001	6,856	49,070.97	1,720	11,169.62	42	57	69	442	2,040
2002	4,987	29,639.07	1,133	7,123.63	42	61	70	461	2,192
2003	5,463	27,941.22	1,249	6,247.48	44	63	70	484	2,348
2004	6,405	33,500.57	1,580	7,483.93	45	64	70	521	2,557
2005	6,474	33,850.52	1,491	7,693.81	47	65	72	548	2,748
2006	7,965	42,781.11	1,671	12,012.87	49	65	73	579	2,994
2007	8,383	50,561.70	1,867	14,953.85	53	65	73	641	3,294
2008	8,464	45,360.43	1,823	11,457.10	55	66	74	683	3,554
2009	6,389	31,129.11	1,239	8,621.07	56	66	74	712	3,693
2010	7,730	41,788.69	1,471	8,534.49	56	66	74	740	3,882
2011	8,343	46,213.38	1,720	11,890.90	58	66	75	779	4,090
2012	7,694	33,995.52	1,627	6,903.88	58	66	75	817	4,286
2013	7,871	35,644.17	1,665	8,446.67	59	66	75	871	4,511
2014	8,001	57,334.45	1,972	14,762.06	61	66	75	908	4,719
2015	8,416	72,037.16	2,276	20,092.72	61	66	75	955	5,007
2016	6,717	56,317.15	1,885	18,431.07	62	66	75	989	5,256

Table D: Sample coverage statistics

Item (per origin-destination-industry triad)	Mean	Q1	Q5	Q9	SD
Panel A: non-zero-boost sample					
Number of years	2.993	1.000	1.000	7.000	4.206
Number of investments (total)	7.133	1.000	1.000	10.000	37.422
Number of investments (per year)	1.295	1.000	1.000	1.833	1.333
Volume of investments (total, $m)	38.512	0.000	3.911	64.344	189.345
Volume of investments (per year, $m)	8.965	0.000	2.225	18.970	39.244
Panel B: zero-boost sample					
Number of years	12.329	2.000	11.000	21.000	7.756
Number of years with no investments	10.005	2.000	9.000	18.000	6.367
Number of years with no volumes	10.504	2.000	10.000	19.000	6.515
Number of investments (total)	7.133	1.000	1.000	10.000	37.422
Number of investments (per year)	0.482	0.062	0.200	1.000	1.355
Volume of investments (total, $m)	38.512	0.000	3.911	64.344	189.345
Volume of investments (per year, $m)	2.975	0.000	0.437	5.697	13.157