



## Herding in foreign direct investment

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### ABSTRACT

This paper, to our knowledge, is the first to examine herding in foreign direct investment (FDI). We investigate it from two perspectives, first the number of countries investing in the host country and then the dollar volumes of those investments. Our results provide strong evidence of herding in FDI. We also show herding in the divestures of these investors. We show that herding in FDI is related to host country characteristics and governance parameters.

### 1. Introduction

In recent years, the political climate in Europe and to a certain extent the US has moved towards anti-globalisation, and nationalist movements have gained traction. Two global trends in FDI have intensified nationalist concerns. On the one hand, foreign direct investment (FDI) has expanded rapidly due to globalisation, integration and EU policies, but on the other hand, the 2008 crisis has sharply shrunk national economies and limited their capacity to satisfy voters. FDI has been one of the main drivers of globalisation and economic integration but at the same time a target for populist movements. A surge in simultaneous entry into a market by corporations creates fear that they could simultaneously exit and devastate the host economy. Such herding behaviour by corporations when combined with bad economic performance would amplify the risks to the economy. Against this backdrop, we address three empirical questions in this paper. Do corporate investors herd in their FDI choices? We show that they do. Then, two additional questions emerge. The first is towards which kinds of countries do managers herd more in their investment? Herding will help the receiving countries receive higher levels of FDI and enjoy the positive economic consequences. The second question is whether herding can be harmful. Therefore, we study divestiture and the dollar volumes in herding separately. We show that herding in foreign capital is mostly beneficial to the receiving countries through investment rather than being destructive through divestiture.

We fill a gap in the herding literature because, to our knowledge this is the first analysis of herding in FDI. Most of the existing studies have focused on the equity and bond markets, where the exit strategies for

investors are much less costly than in FDI. Accordingly, one would expect lower levels of herding in FDI. In contrast, we find considerable levels of herding in FDI inflows, comparable to what has been documented for equities and bonds. Specifically, we estimate the average FDI herding level at about 0.092, significantly higher than the level Lako-nishok, Shleifer, and Vishny (1992) (“LSV” henceforth) report for equities, which is 0.027, and we find comparable levels of the main herding measure to Cai, Han, Li, and Li (2018), who report findings on institutional investors in multiple categories. We then examine the impact of dollar volumes on herding patterns of foreign investors and finally investigate the determinants of corporate herding in FDI. We find that herding is much more pronounced in countries with certain characteristics in terms of size, economic growth levels and good governance characteristics, indicating that a welcoming and stable environment increases herding among foreign investors.

We use a very rich database and investigate herding in FDI inflows using bilateral (partner country), aggregate FDI inflow data, with 4116 unique country pairs for 36 FDI-receiving countries (OECD countries) over a maximum of 38 years, and a total of 44,954 annual FDI inflow observations. We control for several known factors that may affect FDI flows in our analysis of herding.

The rest of the paper is organised as follows. In section 2, we discuss the relevant literature. In sections 3 and 4 we describe the data and methodology. Section 5 presents the results, while section 6 concludes.

### 2. Relevant literature

The term “herding behaviour” was initially used by economists to

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explain people's proneness to follow fashions and fads (Scharfstein & Stein, 1990). Its origins in social psychology refer to the instinctive tendency to behave like others, and from an evolutionary stance it has an adaptive function (Devenow & Welch, 1996). Animals travel in herds to protect themselves against the unknown surroundings, and the same adaptive motivation is behind the decisions of financial investors to follow others. We contribute to the general body of work on herd behaviour in financial markets, and more specifically, herding in international investment. We further contribute to the literature on FDI determinants by investigating which of the known factors impacting FDI flows are also relevant in the herd behaviour of corporate managers.

Herding in equity markets is often defined as a group of investors trading in the same direction over a period of time (Nofsinger & Sias, 1999) or as the tendency to buy and sell the same stocks in the same time frame (Grinblatt, Titman, & Wermers, 1995). What we know about herding comes mostly from the equity markets, as the original studies were conducted in this context (Banerjee, 1992; Bikhchandani, Hirshleifer, & Welch, 1992; Choi & Sias, 2009; Hirshleifer & Hong Teoh, 2003; Jiang & Verardo, 2018; Lakonishok et al., 1992; Scharfstein & Stein, 1990; Welch, 2000; Wermers, 1999; Brown, Wei, & Wermers, 2014; Wei, Wermers, & Yao, 2015; Gu, Guo, and Zhang (2022)). More recent studies have focused on other markets, such as the microloan market (Zhang & Liu, 2012) and the bond market and institutional investors (Cai et al., 2018). To our knowledge, this paper is the first to study herding in FDI.

There are several reasons why herding may occur in equity markets (Wermers, 1999). Reputational risk refers to managers' tendency to disregard their own personal opinion in order to go with the crowd mentality. Also, investors may act in the same way because they get their data from the same sources, or they may process information from the previous trades of those they consider to be more experienced investors, and limit their investment choices. Herding is likely to occur in various fields of financial markets and with all kinds of economic agents (Bernhardt, Campello, & Kutsoati, 2006). Economic agents may choose to follow a leader within their group for different reasons, such as uncertainty over whether their information is correct or an inability to draw a conclusion due to a lack of information (Clement & Tse, 2005; Graham, 1999). Fracassi (2017) shows that managers are influenced by their social peers in making corporate policy decisions. With increasing connections between the companies, the similarity in their capital decisions increases as well. Indirectly, this supports our research question, namely that corporate managers herd in their investment decisions. Zhang and Liu (2012) consider herding in US microloan markets and find it to be rational in this context, while Guo, Holmes, and Altanar., A. (2020) find that institutional herding is spurious. Cai et al. (2018) investigate herd behaviour in the corporate bond market and show that the level of herding is higher than that documented in equities and that the price impact on herding is asymmetric. Work on merger-waves (Duchin & Schmidt, 2013) shows that those who herd lose out on their corporate investments. Povel, Sertsios, Kosova, and Kumar (2016) look at hotel construction at different points in the investment cycle and find that hotels built during construction booms underperform their peers. Buchner, Mohamed, and Schwiendbacher (2020) report herding among international buyout funds especially from smaller funds towards large funds. Herd behaviour is not uncommon in international investment flows, especially since the late 1990s (Choe, Kho, & Stulz, 1999). Clements (2018) considers herding in macroforecasters and shows that when there is a difference due to noise rather than private information there is a tendency to herd. We also show that asymmetric information i. e. lack of information leads to herding. There is a debate surrounding the motives for herding in the financial markets (Devenow & Welch, 1996; Duchin & Schmidt, 2013; Welch, 2000; Zhang & Liu, 2012).

Herd behaviour has been well documented in the equity markets but has not yet been investigated in the context of corporate managers' decisions over FDI. FDI theory suggests that multinational enterprises (MNEs) develop in response to market imperfections in the goods and

factor markets, and then country-specific advantages abroad (Rugman, 1981). The decision process of making direct investments is not a very transparent one. FDI theories suggest that firms seeking to expand into other markets are trying to assert their competitive advantage over the local market (Dunning, 1988). According to an earlier, oligopolistic theory of FDI, originally developed by Knickerbocker (1973), and further developed by, Caves (1971, 1974), Severn and Laurence (1974), and Mansfield, Romeo, and Wagner (1979), firms within one industry may find themselves in an oligopolistic market and will then be prone to follow and imitate their competitors in making investments abroad to maintain competitiveness. Firms may feel that the market will punish them if they are perceived to lag behind their main competitors in their investment activity. Another reason for herd behaviour may be the utilisation of other companies' investigations and assessments of investment opportunities abroad. Furthermore, there is reason to believe that MNEs invest in geographically proximate locations, so as to utilise the specialised workforces, resources, suppliers or infrastructure in the vicinity. The resulting co-location amounts to herding (Dai, Eden, & Beamish, 2013). Similar conclusions are drawn in the finance literature in investigations of herding in equity markets. Not unlike the oligopoly theory, the reason why investors may choose to follow a trend set by others could be due to the perception that other investors have superior knowledge of the investment opportunities (Wermers, 1999). Our findings indicate that herding in FDI is influenced by strong economic factors that provide relevant investment information (such as GDP growth for example) to corporate managers, but we also find that, when there is less transparency or information, either because of poor country governance or physical distance, corporate investors tend to exhibit more herding.

### 3. Data

For our analysis, we consider FDI inflows (investments and divestures) into the 36 OECD member countries<sup>1</sup>, from all of the countries sending FDI to them,<sup>2</sup> from 1981 to 2018.  $FDI_{ijt}$  is the inflow into country  $i$  from country  $j$  in a given year  $t$ , measured in constant (2010) \$US millions. Our data form an unbalanced panel. The dataset includes a total of 44,954 observations of FDI inflows, formed from 4116 unique bilateral country pairs (cross-sections) across 38 years. Table 1 shows the characteristics of the sample, starting with the main variable, FDI net inflows (investments in excess of divestments). FDI inflows range from a maximum value of \$US 251.4 billion (FDI inflows from the United States to Mexico in real (2010) terms in 1981) to a minimum value of -\$US 218.9 billion (net divestment out of Luxembourg by the United States in 2017). Within such a wide range, the average net FDI inflows across the sample of country pairs and the 38-year period is \$US 637 million and the median just \$US 2 million. We conduct our tests on herding using both the number of countries investing in or divesting from an FDI destination and the dollar volumes of those investments and divestments.

<sup>1</sup> OECD member countries are Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Israel, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States (36 countries).

<sup>2</sup> Canada is one of the OECD FDI-receiving countries in our sample. The amount of FDI inflow data reported by Canada is very small compared with other developed nations in the sense that very few countries send FDI to it. One reason for this could be the Investment Canada Act, which monitors and approves all significant investment coming into Canada and requires that all of it should encourage investment, economic growth and employment (<https://www.ic.gc.ca/eic/site/ica-lic.nsf/eng/home>). There are suggestions that this Act restricts the FDI flows going into Canada. We see a marked increase in 2017 and 2018 in the number of countries investing in Canada.

**Table 1**  
Characteristics of the sample.

	FDI inflows from country i to j per annum (million USD)	GDP of FDI-receiving country (million USD)	GDP of FDI-sending country (million USD)	Trade openness of FDI-sending country	Trade openness of FDI-receiving country	GDP growth of FDI-receiving country (%)	GDP growth of FDI-sending country (%)
Mean	637	1,710,172	964,620	0.94	0.93	0.02	0.03
Median	2	530,995	242,023	0.77	0.75	0.02	0.03
Maximum	2,513,961	17,856,500	17,856,500	3.36	7.48	0.26	1.79
Minimum	-218,904	7680.562	30	0.12	0.00	-0.15	-0.64
St. Dev.	14,477	3,151,489	2,212,059	0.61	0.66	0.03	0.04
Observations	44,954	44,954	42,473	44,954	38,849	44,954	42,549
Panel B:							
	Distance	Voice and Accountability	Political Stability	Rule of Law	Control of Corruption	Government Effectiveness	Regulatory Quality
Mean	5607	1.13	0.71	1.20	1.24	1.24	5607
Median	4677	1.14	0.81	1.34	1.34	1.26	4677
Maximum	19,630	1.80	1.76	2.10	2.35	2.10	19,630
Minimum	60	-0.83	-2.01	-0.73	-0.26	-0.05	60
St. Dev.	4536	0.41	0.56	0.63	0.57	0.46	4536
Observations	44,419	36,226	36,226	36,226	36,225	36,226	36,226

This table reports the main descriptive statistics (mean, median, maximum/minimum, standard deviation and number of observations) of the variables used in the FDI inflows regression analysis (eq. 5).

We investigate what determines herding by controlling for the main macroeconomic factors that impact FDI flows. We also control for the receiving country’s governance factors in order to see how these features impact the propensity to herd. These variables are as follows. The *gross domestic products* of the FDI-receiving and -sending countries (*GDPrec*, *GDPsend* respectively), measured in constant \$US millions, are used to show the economic magnitudes of the two markets involved in an FDI relationship, which is one of the main attracting factors between two economic entities. We measure a country’s openness to trade as the sum of exports and imports over GDP for both FDI-receiving and -sending countries (*Openness Rec* and *Openness Send*, respectively). There is a notable correlation between the openness to trade of the receiving country and the GDP of the receiving country, of 58%. However, we keep both variables in the regression. Data on the GDP growth rate for both the FDI-receiving and -sending countries (*GDPgrowthRec* and *GDPgrowthSend* respectively) represent the speed with which the economy grows and favourably impacts FDI flows. The data on *physical distance* (*Distance*) is in kilometres, using a formula (Mayer & Zignago, 2011) which calculates the distance between the two countries in the bilateral FDI pair, and is taken from CEPII (The Centre d’Études Prospectives et d’Informations Internationales; [www.cepii.fr](http://www.cepii.fr)).

We control for the effect of country governance factors that have previously been used to explain FDI flows (Levis, Muradoğlu, & Vasileva, 2016). If country governance factors that have an impact on FDI flows can explain the herding behaviour of corporations, then we will conclude that it is rational herding. We include six variables from the World Governance Indicators (WGI).<sup>3</sup> The six aggregate indicators (Kaufmann, Kraay, & Mastruzzi, 2011) are as follows: *Voice and Accountability* captures perceptions of the extent to which a country’s citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media; *Political Stability and Absence of Violence* captures perceptions of the likelihood the government will be destabilised or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism; *Government Effectiveness* captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies; *Regulatory Quality* captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private-sector development; *Rule of Law* captures perceptions of the extent to which agents have confidence in and

abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence; *Control of Corruption*<sup>4</sup> captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elite and private interests. In the estimations, we use these indexes one by one due to the high correlation between the individual governance indicators (between 62 and 95%; appendix 5).

#### 4. Model

Measuring herding can be a very elusive task (Welch, 2000). As noted earlier, in equity markets it is usually defined as investors buying or selling equity during the same period *t*, which means herding is perceived to occur contemporaneously. The data in this study are aggregate annual data on FDI inflows for bilateral country pairs (*i, j, t*). Even though it would typically require a longer time period for a decision on FDI to be reached at a corporate level, it is quite possible that firms looking at conducting FDI would look to ongoing FDI activity in the sector or that of competitors and mirror those investment choices and location decisions during the same time period, in this case a year. We test for this herding possibility by adapting the widely used LSV (1992) model to our purpose. We measure herding in the context of the difference in investments from an expected benchmark, which we define as the average (per FDI -receiving country) number of FDI inflows (individual investments) made by all FDI-sending countries in a particular year, *t*. We further extend the model to include the dollar volumes of the FDI, to investigate whether there is a destabilising effect for the FDI host country, if there is herding. The herding measure (HM) indicates whether there was herding in the FDI inflow-receiving country at time *t*. With this in mind, we develop it in the following way:

$$HM_{(i,t)} = \left| \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} - \frac{Average \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \right| - AF_{(i,t)} \tag{1}$$

where  $\frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}}$  stands for the sum of the proportion of FDI sending countries *j* that have made positive net inflows into FDI-receiving country *i*, that have invested and divested in receiving country *i*, in

<sup>3</sup> [www.govindicators.org](http://www.govindicators.org)

<sup>4</sup> The data are available for the following years only: 1996, 1998, 2000 and 2002–2018.

year  $t$ .  $\frac{\text{Average} \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  is the ratio of the average number of FDI inflow-sending countries that have made positive net FDI inflows into all receiving countries  $i$  in year  $t$ , to the total number of countries with positive and negative FDI flows into all receiving countries  $i$  at time  $t$ , and represents the expected or benchmark number of FDI-making countries. Our sample of countries with FDI flows to country  $i$  at time  $t$  follows a binomial distribution, with either net positive inflows (investments) or net negative inflows (divestments). We do not consider the non-relationships, where FDI inflow between two countries is zero. The probability of being a net positive FDI investor changes from year to year and this is reflected in the adjustment factor, which shows the probability of being a net positive FDI investor given the total number of active FDIs (positive or negative) in that year.

The adjustment factor (*AF*) is the probability that the fraction of countries sending FDI to a destination country is greater than the sample average, which is zero under the null hypothesis of no herding. We define the FDI decision to follow a binomial distribution (invest versus divest) with probability  $p$  of investment. *AF* is then easily calculated given  $p$  and the number of countries active in the destination country (either investing or divesting) in that year. For any FDI destination country, *AF* declines as the number of FDI-sending countries active in that destination country rises.  $HM_{i,t}$  indicates herding if it is positive. This happens when the number of countries  $j$  investing in country  $i$  is not only greater than the number expected for all countries in the sample, but is also more than would be expected in a binomial distribution with the same mean.

We further distinguish between investment and divestment herding by following Cai et al. (2018) and similarly classify positive or investment herding, and negative or divestment herding as follows:

$$IHM = HM \text{ if } \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} > \frac{\text{Average} \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \text{ and}$$

$$DHM = HM \text{ if } \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} < \frac{\text{Average} \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \quad (2)$$

In the previous analysis we focused on the number of countries investing in a particular destination, while in eq. (3) we consider another dimension, the dollar volume invested in the destination country. This gives a new dimension to herd behaviour among corporate managers. We investigate whether herding in FDI flows, especially in divestures, has the potential to destabilise the host countries' returns on investments, especially if herding of divestments is pronounced. The dollar volume ratio (DVR) measures the excess demand that can eventually lead to destabilisation in the host country:

$$\text{Dollar volume ratio}_{i,t} = \frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} \quad (3)$$

where  $\sum_{j=1}^J FDI\ investment_{i,t}$  is the total amount of positive FDI inflow (in real \$US million) into receiving country  $i$  at time  $t$  from all sending countries  $j$ , and  $\sum_{j=1}^J FDI\ divestment_{i,t}$  is the total amount of negative FDI flow (in real \$US million) out of receiving country  $i$  by all its FDI partner countries  $j$  at time  $t$ . Like with the main herding measure, we split the dollar volume ratio into a dollar investment herding measure (DIHM) and a dollar divestment herding measure (DDHM):

$$DIHM = DVR \text{ if } \frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} > 0 \text{ and}$$

$$DDHM = DVR \text{ if } \frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} < 0 \quad (4)$$

We further develop our analysis by considering whether the herd behaviour as captured by our measure in eq. (1) above can be explained by economic factors known to influence FDI. This will give us insight into the main drivers of herding in FDI inflows. We estimate the following model, to investigate whether corporate managers' movement in tandem might be explained by the FDI-welcoming attributes of the host country:

$$HM_{(i,t)}(DVR_{(i,t)}) = \beta_0 + \beta_1 \log(GDP_{prep}) + \beta_2 \log(GDP_{send}) + \beta_3 \log(Openness_{Rec}) + \beta_4 \log(Openness_{Send}) + \beta_5 \log(GDP_{growthRec}) + \beta_6 \log(GDP_{growthSend}) + \beta_7 \log(Distance) + \beta_8 Governance + \epsilon_{i,j,t} \quad (5)$$

where  $HM_{(i,t)}$  is the herding measure as defined in eq. (1) above for country  $i$  at time  $t$  and  $DVR_{(i,t)}$  is the dollar volume herding measure as defined in eq. (3). The first group of independent variables indicate how appealing the host country is for foreign direct investors and thereby whether herding is rational. The GDP of the receiving country in the FDI bilateral relationship is the first indicator of economic attractiveness to foreign investment. A country's openness to trade has been noted to have a stimulating influence on FDI flow to that country and we represent this influence by the country's exports plus imports as a percentage of its GDP. We also include the GDP growth rates of the FDI inflow-receiving and -sending countries. *Distance* is the logarithm of the physical distance (in km) between the FDI-sending and -receiving countries as this is a variable with a known impact on trade and capital flows. The *Governance* variables indicate how welcoming the FDI-receiving country's governance characteristics are to FDI. As noted above, due to the high correlation (appendix 5) between these variables, we include them in our analysis one by one. For robustness, we estimate the same model described in eq. (5) using the dollar volume ratio from eq. (4) as a dependent variable, in order to investigate whether the same determinants impact dollar volumes as numbers of investments.

## 5. Results

### 5.1. Herding in FDI inflows

We explore whether corporate managers making FDI decisions have a tendency to move in the same direction when considering a destination country for their direct investments in a given year. FDI is measured at the country level, and we consider the clustering of corporate managers from different countries in their FDI decisions about a target country. If a disproportionate number of countries' foreign direct investors are investing in a particular destination country, we deem this to be herding. Consider the following example, which illustrates our herding measure. Assume that, in a certain year, when aggregated across all FDI-receiving and -sending countries, half of all FDI decisions are investments (positive FDI flows) and half are divestures (negative FDI flows). If, for a particular destination country, half of the foreign investor countries have increased their investments (positive FDI flows into the destination country) and the other half have decreased theirs (negative FDI flows), we would conclude that there is no herding regarding the FDI inflows to that particular destination country. On the other hand, if, for another destination country, 60% of the FDI-sending countries increased (decreased) their investments and 40% decreased (increased) their investments, and this measure is greater than zero when including the adjustment factor, we would conclude there was herding for that particular destination country in that year. We control for factors that

**Table 2**  
Herding in FDI inflows.

	All FDI-receiving countries (1)	Countries with less than median inflows (2)	Countries with more than median inflows (3)
Positive HM			
Mean	0.092 (0.007)	0.100 (0.012)	0.085 (0.009)
Positive HM Median	0.084	0.101	0.077
IHM Mean	0.077 (0.009)	0.090 (0.015)	0.065 (0.011)
IHM Median	0.071	0.080	0.064
DHM Mean	0.087 (0.010)	0.087 (0.009)	0.086 (0.015)
DHM Median	0.074	0.086	0.068

This table shows the herding measure statistics for all FDI-inflow-receiving countries during 1981–2018. The herding measure is defined as

$$HM_{(i,t)} = \left[ \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} - \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \right] - AF_{(i,t)}, \text{ where } \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}}$$

stands for the proportion of the number of positive FDI inflows into the FDI-inflow-receiving country *i*, from all sending countries which have invested or divested in receiving country *i*, in year *t*.  $\frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  represents the expected or benchmark level of investment in that year in all receiving countries (*i*). It is the average number of sending countries that have made positive (negative) FDI inflows into all receiving countries (*i*) in year *t*, out of the average total number of FDI inflows (positive and negative) from all sending countries to all receiving countries (*i*) at time *t*, and where the adjustment factor is defined

above in eq. (1). IHM stands for the  $HM_{i,t}$  if  $\frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} > \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  and DHM stands for the  $HM_{i,t}$  if  $\frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} < \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$ . The herding measures are calculated for the whole sample and two sub-groups, where the sample is divided according to the total number of inflows from sending countries to the receiving country *i*, across time *t*. The standard errors are in brackets.

determine this behaviour in the regression analysis in section 5.4.

Table 2 presents the results for corporate herding behaviour in the context of FDI inflows as defined in eqs. (1) and (2). According to eq. (1), herding behaviour occurs when there is clustering in the FDI flow towards the destination country, measured as the number of countries investing in country *i* at time *t* being greater than the benchmark expected average number of countries investing in any country *i* in that year *t*. We report the mean and the median herding measure, as well as the standard errors of the mean assuming independence across years.

We observe herding. The mean herding measure is 0.092. This is comparably higher than the figure of 0.027 found for the fund managers in LSV (1992), and is at a comparable level to the different herding measures for institutional herding in the corporate bond market in Cai et al. (2018), who find an overall mean for all institutions of 0.11. The median herding measure is 0.084, slightly lower than the mean. When we divide the FDI-receiving countries into two groups, with above<sup>5</sup> and

<sup>5</sup> Countries that average less than the median number of FDI inflows in the sample: Canada, Israel, Latvia, Lithuania, Switzerland, Chile, Norway, Iceland, Austria, New Zealand, Australia, Finland, Turkey, the Slovak Republic, Slovenia, Japan, Ireland and Greece.

below<sup>6</sup> the median number of FDI investments (appendix 1) from partner countries, we observe mean herding measures that are quite close to the overall mean (0.092), of 0.100 and 0.085 respectively. This indicates that there is slightly more herding towards countries which are smaller or have lower frequencies of FDI flows.

In the rest of Table 2, we consider further specifications of the main herding measure, namely investment and divestment herding. These measures are calculated as outlined in eq. (2). The herding measure sample is split according to a country's herding measure relative to the benchmark average amount of herding. This is an alternative specification, which shows a new dimension of the herding measure. Looking at IHM (DHM) in Table 2, we can observe overall means of 0.077 (0.087). We observe that both of these herding measure specifications are slightly lower than the main overall measure we discussed above. They also show there is a slightly greater tendency towards herding in divestment. In columns 2 and 3 of Table 2, we observe the split of the sample into FDI-receiving countries with below and above the median number of investments. The mean IHM and DHM for the sample with below the median number of FDI inflows are 0.090 and 0.087 respectively, while in the group with above the median FDI inflows, the DHM has a clearly higher mean value of 0.086, compared to a mean of just 0.065 for the IHM. This supports the earlier observation for the sample as a whole where, again, there was a tendency for more herding in divestments. When looking at the median values for IHM and DHM, we do not observe a great difference between them, other than to note that the DHM median is slightly higher. It is worth noting that, when it comes to investing in countries above the median number of investments, as they tend to be richer, more developed countries, there is generally more investment opportunity as well as more relevant investor information. This might be why we observe that herding in divestments is higher than that in investments. This is a cautionary signal for smaller countries that receive FDI less frequently, which may find themselves destabilised by a sudden divestment wave.

FDI is long term and corporate managers investing in a foreign destination cannot easily liquidate and leave that destination. We show that foreign direct investors in one country will follow those in another country towards or away from destination countries. What we observe might be due to the many destination countries that are becoming more attractive investment opportunities for corporate managers in other countries. We consider this and conduct further analysis to investigate the possibility of more extensive herding towards certain types of countries that are becoming more attractive to foreign direct investors. According to gravity theory (Tinbergen, 1962), economies that are larger, more open to trade and that have higher growth rates are more attractive to foreign direct investors. We next analyse whether corporate managers are more apt to herd towards countries that are more welcoming to FDI and away from countries that are less welcoming to FDI.

In Table 3, we present the FDI inflow herding measures as outlined in eq. (1), in quintiles according to host country size, openness and GDP growth rates. The quintiles for all tables to follow are calculated for each investment year separately. For clarity of grouping, the appendices show groups of countries according to quintiles which are averaged across all investment years. Standard errors for each quintile are reported in parenthesis. Panel A shows results for the country size quintiles. We observe the highest FDI herding in country size quintile 4, the second-highest group of countries in terms of GDP. The mean herding measure for these countries is 0.125, considerably greater than the overall herding mean of 0.092.

Panel B reports the mean herding measure across the country

<sup>6</sup> Countries that average more than the median number of FDI inflows in the sample: Estonia, Spain, Portugal, the United Kingdom, Belgium, the Czech Republic, Luxembourg, Denmark, Sweden, Mexico, Hungary, Poland, Korea, the Netherlands, the United States, Italy, France and Germany.

**Table 3**

Herding in FDI investments and host country characteristics (country size, openness and growth).

Panel A: by country size					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
Mean	0.089 (0.006)	0.080 (0.007)	0.108 (0.008)	0.125 (0.007)	0.083 (0.006)
Panel B: by country openness					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
Mean	0.096 (0.007)	0.111 (0.008)	0.107 (0.008)	0.080 (0.006)	0.091 (0.007)
Panel C: by country GDP growth					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
Mean	0.100 (0.007)	0.097 (0.007)	0.089 (0.006)	0.093 (0.007)	0.105 (0.008)

This table shows the herding measure statistics for all FDI-inflow-receiving countries during 1981–2018, divided into quintiles according to country size, openness and GDP growth. The herding measure is defined as

$$HM_{(i,t)} = \left| \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} - \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \right| - AF_{(i,t)}, \text{ where } \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}}$$

stands for the proportion of positive FDI inflows into FDI-inflow-receiving country *i*, from all sending countries which have invested or divested in receiving country *i*, in year *t*.  $\frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  represents the expected or benchmark level of investment in that year in all receiving countries (*i*). It is the average number of sending countries that have made positive (negative) FDI inflows into all receiving countries (*i*) in that year *t*, out of the average of the total FDI inflows (positive and negative) from all sending countries to all receiving countries (*i*) at time *t*, and where the adjustment factor is defined above. The standard errors are in brackets.

openness quintiles. The highest herding measure is observed for the second quintile, which are the second least open countries; the mean herding measure of this group is 0.111. The nature of the openness measure (exports plus imports over GDP) makes the countries with larger GDPs appear less open, while the smaller countries that are more dependent on trade are in the most open quintiles. With this in mind, the findings in Panel B do not contradict our previous findings.

In Panel C, we report the herding measure across the country growth quintiles. The highest mean herding measure is observed in quintile 5, the group with the highest average GDP growth, and it is 0.105. Overall, we observe that herding is related to the economic attributes and conditions of the destination countries. Corporate managers herd more when entering larger (but not the largest) economies, moderately/less open ones and the fastest growing countries. Indeed, herding might be rational in the sense described in other herding studies supporting rational herding (Devenow & Welch, 1996; Zhang & Liu, 2012) and is consistent with the main determinants of trade and FDI flows from standard gravity models (Anderson & Van Wincoop, 2003; Tinbergen, 1962). Just like in trade, direct investments gravitate towards economic environments that are welcoming. We further investigate this issue of the nature of the countries that attract more herding below using multivariate analysis.

In Table 4 we present the investment and divestment herding measures (IHM and DHM) which were defined earlier in eq. (2), according to the host country characteristics, in the same way as we did for the general herding measure in the previous Table 3. In Panel A, we look at the IHM and DHM for the quintiles defined according to country size. Here, we can see the same tendency to invest more in countries which are bigger. However, we can also see a tendency to herd more when divesting away from the smallest countries. This may be linked to the

**Table 4**

Investment and divestment herding, and host country characteristics (country size, openness and growth).

Panel A: Country size					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
IHM	0.075 (0.006)	0.072 (0.008)	0.084 (0.008)	0.144 (0.009)	0.090 (0.008)
DHM	0.100 (0.009)	0.087 (0.011)	0.129 (0.013)	0.067 (0.012)	0.074 (0.008)
Panel B: by Country openness					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
IHM	0.114 (0.007)	0.123 (0.008)	0.098 (0.010)	0.068 (0.008)	0.063 (0.008)
DHM	0.059 (0.009)	0.086 (0.011)	0.113 (0.013)	0.089 (0.010)	0.112 (0.011)
Panel C: by GDP growth					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
IHM	0.098 (0.090)	0.088 (0.087)	0.079 (0.092)	0.106 (0.090)	0.118 (0.082)
DHM	0.103 (0.011)	0.106 (0.012)	0.098 (0.012)	0.080 (0.010)	0.085 (0.011)

This table shows the herding measure statistics for all FDI-inflow-receiving countries during 1981–2018, divided into quintiles according to country size, openness and GDP growth.

The investment herding measure (IHM) stands for the  $HM_{i,t}$  if

$$\frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} > \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$$

and the divestment herding measure (DHM) stands for the  $HM_{i,t}$  if

$$\frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} < \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$$

stands for the proportion of positive FDI inflows into FDI-inflow-receiving country *i*, from all sending countries which have invested or divested in receiving country *i*, in year *t*.  $\frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  represents the expected or benchmark level of investment in that year in all receiving countries (*i*). The standard errors are in brackets.

host country characteristics that appear in the smallest quintile, such as poorer country governance. We investigate this relationship later on, in section 5.4.

When it comes to countries' openness to trade, as presented in Panel B of Table 4, the results imply that there is less herding in investment towards less open countries. This is consistent with expectations from previous literature on FDI determinants. We observe the opposite for divestment, however. There is more herding in divestment from the moderately and the most open countries. The most open economies according to our definition (appendix 3) are also some of the emerging markets and smaller, fast-growing countries. This makes it easier to understand this finding.

In Panel C we present the statistics for IHM and DHM according to the GDP growth quintiles. We observe a similar pattern. There is more herding in investments going into countries with the highest GDP growth and more herding in divestment away from the economies with lower growth (which tend to be the most developed countries, appendix 4).

### 5.2. Dollar volume ratio and FDI herding behaviour

Herding among corporate managers has the potential to destabilise returns on investments. The relevant variable for this destabilisation is excess demand. If the foreign investors decision to invest (or divest) is considered in the context of the dollar amount invested (divested) then we may see different results to those of the previous analysis that considered the numbers of countries investing in an FDI-receiving

**Table 5**  
Dollar volume herding in investments and divestments.

	All FDI-receiving countries	Less than median number country investments in host country	More than median number country investments in host country
DVR Mean	0.653 (0.037)	0.618 (0.042)	0.688 (0.036)
DVR Median	0.630	0.587	0.698
DIHM Mean	0.713 (0.024)	0.695 (0.038)	0.732 (0.031)
DIHM Median	0.699	0.696	0.739
DDHM Mean	0.232 (0.049)	0.286 (0.080)	0.175 (0.055)
DDHM Median	0.145	0.187	0.091

This table shows the dollar volume ratio statistics for all FDI-inflow-receiving countries during 1981–2018. The dollar ratio is defined as  $Dollar\ volume\ ratio_{i,t}(DVR) =$

$$\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}}$$

and represents the total net FDI investment into receiving country *i* from all of its sending countries, divided by the total amount invested. The dollar investment and divestment herding measures are defined as follows: the dollar investment herding measure (DIHM) stands for the DVR if  $\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} > 0$  and the dollar divestment herding measure (DDHM) stands for the DVR if  $\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} < 0$ . The standard errors are in brackets.

country. We investigate dollar volume herding to inspect whether it has the potential to destabilise the host countries.

We first compute the general dollar volume ratio (DVR), as defined in eq. (3) and, like in the previous analysis, we split the sample as described in eq. (4) by calculating the dollar investment and dollar divestment herding measures (DIHM and DDHM).

Table 5 is comparable to Table 2 in terms of the type of statistics presented. It presents the results from eq. (4) and we report the mean and median DVRs. We show overall mean values as well as those for groups split according to the median level of the number of investments in the FDI-receiving country. The mean of the DVR is 0.653. This measure shows the proportion of positive FDI inflows relative to all positive and negative (in absolute terms) FDI flows into and from the FDI-receiving country. The DVR can range from a maximum of 1 if all FDI in the year were net positive for all country pairs of an FDI-receiving country, to -1 if all were net divestments. In Table 5 we can observe that there are more positive investments than divestments in terms of the dollar volume. This is to be expected, as FDI is a long-term decision and we would not expect to see the same amount of speculative investment as in the equity markets. In columns 2 and 3 of Table 5 we can observe that the mean values for the below and above median numbers of FDI investments are 0.618 and 0.688 respectively. The difference between them is not large. Looking at the median DVRs, the lower value of 0.587 occurs in the countries with below median numbers of FDI investments. This is to be expected as they generally represent economic environments that are smaller and have fewer investment opportunities.

We next calculate the dollar investment and divestment measures, as defined in eq. (4). Looking at the DIHM mean and median, we can observe a similar pattern to that seen in the overall mean values. The highest DIHM mean of 0.732 is found for the group of countries with above median numbers of investments, which represent the bigger economies with numerous investment opportunities. This is to be expected and is consistent with the standard gravity model determinants. Turning our attention towards the DDHM, we can observe an opposite effect to that seen with the DIHM. In the case of divestments, a more sizeable cluster appears in the countries with below median FDI investments, at 0.286 compared to 0.175 for the above median group. This indicates that FDI in smaller and less inviting economies (appendix 1) is also more prone to have a destabilising effect, with higher dollar volumes being divested away from them. A more in-depth country-specific analysis might reveal more information regarding more specific reasons for this. The median DDHMs reveal an even starker contrast, with that

**Table 6**  
Dollar volume herding ratio investment and divestment and host country characteristics.

Panel A: Country size					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
DIHM	0.723 (0.021)	0.675 (0.021)	0.713 (0.022)	0.849 (0.016)	0.754 (0.020)
DDHM	0.223 (0.053)	0.265 (0.087)	0.230 (0.057)	0.250 (0.087)	0.126 (0.041)
Panel B: by Country openness					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
DIHM	0.808 (0.018)	0.808 (0.017)	0.705 (0.022)	0.675 (0.022)	0.702 (0.023)
DDHM	0.210 (0.080)	0.246 (0.179)	0.217 (0.061)	0.189 (0.053)	0.257 (0.055)
Panel C: by GDP growth					
	Quintile 1 (small)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (large)
DIHM	0.716 (0.020)	0.695 (0.022)	0.750 (0.020)	0.756 (0.020)	0.807 (0.019)
DDHM	0.241 (0.051)	0.305 (0.110)	0.150 (0.048)	0.220 (0.078)	0.216 (0.063)

This table shows the dollar investment and divestment herding measures for all FDI-inflow-receiving countries during 1981–2018, divided into quintiles according to country size, openness and GDP growth. The dollar investment and divestment herding measures are defined as follows: The dollar investment herding measure (DIHM) stands for the DVR if  $\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} > 0$  and the dollar divestment herding measure (DDHM) stands for the DVR if  $\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}} < 0$ , where DVR stands for  $\frac{\sum_{j=1}^J FDI\ investment_{i,t} - \sum_{j=1}^J FDI\ divestment_{i,t}}{\sum_{j=1}^J FDI\ investment_{i,t} + \sum_{j=1}^J FDI\ divestment_{i,t}}$  and represents the total net FDI investment into receiving country *i* from all of the countries sending FDI to it, divided by the total amount invested. The standard errors are in brackets.

for the below median countries equal to 0.187, compared with just 0.091 for the countries with above median numbers of investments. This shows that dollar divestment clustering occurs mostly with FDI destinations

that are smaller and less frequently used as FDI destinations, which can have a destabilising effect on them.

In Table 6 we present herding statistics for dollar investment and divestment volume measures according to host country characteristics (splitting the sample into quintiles based on countries' size, openness and growth). The main sample is split into two groups, with the DIHM calculated if the proportion (volume) of positive FDI inflows with respect to the total dollar volume invested or divested is greater zero, and the DDHM calculated otherwise. In Panel A of Table 6, we present the results according to the country size (GDP) quintiles. The largest value of DIHM (0.849) is found in quintile 4, which indicates that the greatest dollar volume herding takes place towards large but not the very largest countries. This finding is consistent with the results for the comparable investment herding measure (IHM) discussed earlier and shown in Table 4. Looking at dollar volume divestments in the same panel, we can observe the largest value (0.265) in quintile 2, namely small but not the smallest countries. This finding is consistent when looking at herding in terms of both dollars and numbers of investments, indicating that there is a clustering in divestment away from smaller countries. They are thus more vulnerable to the negative financial effects of FDI.

In Panel B of Table 6, we present the mean values of DIHM and DDHM according to the country openness quintiles. We observe the highest DIHMs, with a mean value of 0.808, in quintiles 1 and 2. We observe the highest mean value of DDHM (0.257) in quintile 5, that is the most open economies.

Lastly, in Panel C, we report the mean values for DIHM and DDHM according to the GDP growth quintiles. In this panel, we observe the highest mean value of DIHM, of 0.807, in quintile 5, the countries with the greatest GDP growth. The highest mean of DDHM is 0.305, and is observed in quintile 2, the countries with lower but not the lowest growth.

### 5.3. Herding measures contingent on past performance

We next take a look at the relationship between the main herding measure as defined in eq. (1) and the past performance in terms of the lag of FDI dollar inflows, according to which we split the sample into five quintiles. This captures a fresh perspective on potential drivers behind changes in the levels of herding. The next table combines past dollar volumes and current numbers of investments to investigate whether an increase in past FDI has an effect on current herding in the number of FDI investments. The results are displayed according to host country characteristics (country size, openness and GDP growth quintiles). The standard errors are not reported in this table for brevity, and instead their significance is reported next to the mean value. We can observe that the overwhelming majority of the coefficients are significant at the 1% level.

We do not observe any monotonic pattern in the relationship between past performance and the size, openness and growth rate quintiles in Table 7. Looking at Panel A (according to GDP size quintiles), we can broadly see the clustering of higher herding measure averages in quintile 3 when it comes to past performance and quintile 4 when it comes to country size. This supports previous findings that, in general, there is more herding towards larger but not the largest economies and, counterintuitively, this occurs more when their performance was not the best in terms of dollar volumes the year before. One might conclude that, regardless of their past performance, when looking at country size, quintile 4 attracts the most herding from corporate managers.

When looking at Panel B, in the classification according to countries' openness to trade, we cannot observe a common pattern. For each past year's performance quintile there is a different openness quintile in which the herding measure is greatest. We could conclude from this that past performance does not influence how much herding there is in countries with different levels of openness to trade. Similarly, when looking at Panel C, in relation to GDP growth, we cannot make a

**Table 7**  
Time dependence and herding in FDI investment.

Panel A: Country size					
Previous year performance	Quintile 1 (low openness)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (high openness)
1 (worst)	0.093***	0.100***	0.121***	0.104***	0.086***
2	0.077***	0.068***	0.124***	0.172***	0.114***
3	0.111***	0.073***	0.128***	0.148***	0.115***
4	0.081**	0.086***	0.085***	0.142***	0.087***
5 (best)	0.058**	0.022*	0.074***	0.082***	0.059***
Panel B: Country openness					
Previous year performance	Quintile 1 (low openness)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (high openness)
1 (worst)	0.064***	0.142***	0.083***	0.077***	0.126***
2	0.094***	0.090***	0.128***	0.062***	0.071***
3	0.150***	0.105***	0.123***	0.095***	0.071***
4	0.112***	0.116***	0.106***	0.113	0.077***
5 (best)	0.064***	0.104***	0.031**	0.078**	0.046***
Panel C: GDP growth					
Previous year performance	Quintile 1 (low openness)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (high openness)
1 (worst)	0.087***	0.114***	0.109***	0.094***	0.099***
2	0.101***	0.089***	0.068***	0.074***	0.112***
3	0.106***	0.116***	0.138***	0.086***	0.120***
4	0.131***	0.109***	0.080***	0.123***	0.093***
5 (best)	0.065***	0.056***	0.061***	0.088***	0.081***

This table shows the herding measure statistics for all FDI investment in the FDI-receiving countries during 1981–2018, divided into quintiles according to country size, openness and GDP growth and across five quintiles according to previous year FDI dollar volumes. The herding measure is defined as

$$HM_{(i,t)} = \left| \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}} - \frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}} \right| - AF_{(i,t)}, \text{ where } \frac{FDI_{positive\ i,t}}{FDI_{total\ inflows\ i,t}}$$

stands for the proportion of positive FDI inflows into FDI-inflow-receiving country *i*, from all sending countries which have invested or divested in receiving country *i*, in year *t*.  $\frac{Average\ \sum_{j=1}^J FDI_{i,t}}{FDI_{total\ inflows\ i,t}}$  represents the expected or benchmark level of investment in that year in all receiving countries (*i*). It is the average number of sending countries that have made positive (negative) FDI inflows into all receiving countries (*i*) in that year *t*, out of the average total number of FDI inflows (positive and negative) from all sending countries into all receiving countries (*i*) at time *t* and where the adjustment factor is defined above. The standard errors are not presented here for brevity and the coefficients' significance levels are indicated by \*, \*\* and \*\*\* which stands for the 10%, 5% and 1% levels, respectively.

generalisation about the findings. The highest investor herding clusters are located in different quintiles depending on the past performance.

The mean values are not always similar across the three panels. There are clear leading values in each quintile. This indicates that the previous year's performance does affect herding levels differently across different country parameters but not in a predictable or uniform manner. Further country-specific investigation may reveal more specific reasons why this is the case. Foreign direct investors do not invest or divest following peers from countries with similar country profiles to their own who have increased or reduced their investments. FDI decisions are long-term commitments and it is possible that corporate managers do not base their decisions on the decisions of the previous year but rather that herding mostly takes place based on contemporaneous economic conditions in the FDI-receiving countries.

### 5.4. Determinants of herding behaviour in FDI inflows

In order to investigate what drives herding in foreign direct investment and divestment, we estimate a regression model on the main



**Table 8**  
Determinants of herding in FDI inflows.

	(1)	(2)	(3)	(4)	(5)	(6)
C	0.134*** (0.000)	0.142*** (0.000)	0.104*** (0.000)	0.096*** (0.000)	0.095*** (0.000)	0.103*** (0.000)
(Log) GDPrec	-0.001 (0.137)	-0.004*** (0.000)	-0.001*** (0.002)	0.000 (0.711)	-0.001 (0.179)	-0.002*** (0.000)
(Log) GDP send	0.001** (0.011)	0.000 (0.160)	0.000 (0.314)	0.001** (0.011)	0.001** (0.019)	0.000 (0.356)
Openness rec	-0.008*** (0.000)	-0.008*** (0.000)	-0.019*** (0.000)	-0.011*** (0.000)	-0.015*** (0.000)	-0.020*** (0.000)
Openness send	0.000 (0.710)	0.000 (0.961)	0.000 (0.929)	0.001 (0.411)	0.001 (0.509)	0.000 (0.994)
GDP growth rec	0.120*** (0.000)	0.216*** (0.000)	0.313*** (0.000)	0.297*** (0.000)	0.277*** (0.000)	0.313*** (0.000)
GDP growth send	0.016 (0.290)	0.016 (0.302)	0.014 (0.377)	0.014 (0.356)	0.014 (0.356)	0.014 (0.360)
(Log) Distance	0.003*** (0.003)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Voice and Accountability	-0.057*** (0.000)					
Political Stability		-0.040*** (0.000)				
Govern. Effectiveness			-0.015*** (0.000)			
Regulatory Quality				-0.036*** (0.000)		
Rule of Law					-0.023*** (0.000)	
Control of Corruption						-0.011*** (0.000)
N	30,709	30,709	30,709	30,709	30,709	30,709
Adj. R <sup>2</sup>	0.09	0.09	0.05	0.07	0.06	0.05

The dependent variable is the herding measure as defined in eq. (1). The explanatory variables are as follows: log of the GDP of the FDI-receiving country; log of the GDP of the FDI-sending country; trade openness (exports plus imports over GDP) of the FDI-receiving country; trade openness of the FDI-sending country; GDP growth of both the receiving and sending countries; log of the physical distance between countries *i* and *j* in kilometres; voice and accountability index; political stability and absence of violence index; government effectiveness; regulatory quality; rule of law; control of corruption. The *t*-statistics are based on standard errors that have been adjusted for heteroskedasticity using White diagonal standard errors; period fixed effects used; \*, \*\* and \*\*\* stand for significant coefficients at the 10%, 5% and 1% level respectively; *p*-values are in brackets.

herding measure. This will show which factors in the FDI-receiving or -sending country matter most when it comes to corporate investors' herd behaviour. This is especially important when it comes to divestments, as they have particular potential to destabilise the host economies.

Table 8 presents the results of the regression based on eq. (5). In model 1, we report results based on our herding measure from eq. (1) and known macroeconomic variables used in the standard gravity models, where we test whether herding in FDI is determined and explained by those variables. Due to the high multicollinearity (appendix 5) between the various country governance measures, we use the measures one by one in the remaining models 2 through 5. We observe that characteristics of the FDI-sending countries that are traditionally used in gravity models to explain FDI flows are not related to our herding measure (HM) in most of the models. Herding in numbers of investments (as defined in eq. 1) among FDI investors is largely not related to the characteristics of the sending country, but almost entirely to the characteristics of the FDI-receiving country. This finding is important and supports our explanation of investors herding most when there is a lack of information or transparency about the destination, either due to poorer country governance or because the country is further away or less open to trade. Traditional gravity models and models focusing on FDI determinants show that sending- and receiving-country characteristics are equally important and increase FDI interaction. We find, however, that herding among investors is mostly driven by the host country's features, especially its GDP growth. The coefficient estimate for the size of the FDI-receiving economy (measured as the logarithm of GDP) is negative and significant in models 2, 3 and 6 of Table 8. In standard gravity models, the larger is the country, the larger is its GDP, the more FDI it attracts. In our model, we find that the larger is the country, the less herding there is. This could be because countries

with the biggest GDPs tend to be the most developed and transparent in terms of investment information, and thus corporate investors do not need to follow others in their investment.

We observe a similar relationship between our herding measure (HM) and the openness of the FDI-receiving country. In standard gravity models, the higher the openness to trade, the higher are the FDI inflows to the host country. We find that herding among foreign direct investors diminishes as the openness of the FDI-receiving country increases. This is to be expected and is consistent with the previous conclusion regarding information about the investment destination.

The coefficient estimates for the GDP growth rate of the receiving country are positive and significant across all six models in Table 8, and range between 0.120 and 0.313, indicating that herding increases towards high-growth countries. Economically, the GDP growth rate is the most significant determinant of herding in FDI inflows. A higher growth rate in the FDI-receiving country acts as a pull factor that increases herding among foreign direct investors.

In standard gravity models, the geographical distance has a negative coefficient, indicating that FDI flows from neighbouring countries are higher. We show that there is more frequent herding of investment between countries which are further apart. The coefficient estimate for *Distance* is between 0.003 and 0.004, indicating that, when the distance between two countries increases, so does herding. This finding is consistent with the asymmetric-information argument that corporate managers will have better knowledge of neighbouring countries and will therefore herd less when investing there. This is also the case when we consider the volumes of FDI flows which we will discuss below.

According to the asymmetric information theory, countries with better governance should provide better information for corporate managers and thus reduce the need for herding. We use six different

country governance indicators (Kaufmann et al., 2011). Due to the high correlation (appendix 5) among these indicators, we use them one by one in six different models. Each of these indicators take values ranging from -2.5 (weak) to 2.5 (high), reflecting governance performance. In models 1 to 6 of Table 8, we report the results for voice and accountability (extent to which citizens can participate in electing their government, freedom of speech and press), political stability (likelihood that a government can be destabilised or overthrown by unconstitutional and violent means), government effectiveness (quality of public services, civil service and their independence from political pressure), regulatory quality (ability of a government to create and implement policies and regulations which promote private-sector development), rule of law (extent to which agents have confidence and abide by the rule of law) and control of corruption (extent to which public power is exercised for private gain in terms of corruption and “state capture”). In all six models, the coefficient estimates for the governance indicators are negative, indicating that corporate managers herd less towards countries with better governance. This means that, when countries improve the conditions for investing in them, in terms of a lack of corruption, increased political stability and rule of law, for example, this sends a positive signal to corporate managers that the country is maturing and thus FDI investors do not need to rely on following other investors when choosing those countries to invest in.

In Table 9, we regress the DVR (from eq. 3) on the FDI determinants from eq. (5). In this regression, we can observe a return of the significance of the sending country’s characteristics. We can observe that there is less dollar volume herding when both the receiving and sending countries have larger GDPs. We observe the same when the receiving country is more open. When both the sending and receiving countries have higher growth rates, there is more dollar volume herding. This supports the classic theory of the determinants of FDI activity between economies, which suggests that there will be more FDI during high-growth periods.

Another key observation is the loss of significance of the distance variable, which is one of the most robust in standard gravity models. This indicates that, while distance plays an important role in increasing herding in terms of the number of investments (Table 8), when it comes to the dollar volume, it no longer plays a role. This is a very interesting finding. Corporations who invest abroad will not be deterred by the distance in terms of the dollar amounts of their investments. Foreign investments for corporations take time to set up in terms of forming relations and understanding the environments. High dollar value transactions (for example large one off cross-border M&A), are not related to geographical distance. Finally, when we consider the country governance indicators, we can see that they remain negative and significant, indicating that, as for the previous case of numbers of investments, with dollar volume too, there is less herding in investment in countries with better governance.

5.5. Robustness

We consider some additional tests in order to establish the robustness of the herding analysis and governance variables used in the previous sections.<sup>7</sup>

5.5.1. Additional analysis of herding in FDI inflows

The herding measure we used in this study is based on LSV (1992). Another popular approach in measuring herding in equity markets is through the deviation from expected market returns. They are the cross sectional standard deviation, CSSD, (Christie & Huang, 1995) and cross sectional absolute deviation, CSAD, (Chang, Cheng, & Khorana, 2000). We adapted these measures for our context of FDI flows.

<sup>7</sup> We would like to thank an anonymous referee for the suggested robustness tests.

We adapted the first method, by Christie and Huang (1995) that looks at the cross-sectional standard deviation (CSSD) and represented it with the following specification:

$$CSSD_{i,j,t} = \sqrt{\frac{\sum_{i=1}^N (RFDI_{i,j,t} - RFDI_{avg,t})^2}{N - 1}} \tag{6}$$

N is the number of FDI sending countries j, that have invested in FDI receiving country i, at time t;  $RFDI_{i,j,t}$  is the observed annual percentage change in FDI inflow to country i from country j at time t;  $RFDI_{avg,t}$  is the cross-sectional average of the annual percentage change for all FDI receiving countries at time t.

We estimate the following equation:

$$CSSD_{i,j,t} = \beta_0 + \beta_1 FDID_{i,j,t} + \beta_2 FDID_{u_{i,j,t}} + \epsilon_{i,j,t} \tag{7}$$

Where  $FDID_{i,j,t}$  ( $FDID_{u_{i,j,t}}$ ) is equal to 1 if the return on the  $RFDI_{avg,t}$  lies in the lower 5th percentile (upper 95th percentile) tail of the  $RFDI_{avg,t}$  and zero otherwise. We expect  $\beta_1(\beta_2)$  to be negative if there is herding, as this would imply lower deviation from the market and therefore herding.

We next adapt the model by Chang et al. (2000) who develop a non-linear specification called cross-sectional absolute deviation (CSAD), as follows:

$$CSAD_{i,j,t} = \frac{1}{N} \sum_{i=1}^N |RFDI_{i,j,t} - RFDI_{avg,t}| \tag{8}$$

$$CSAD_{i,j,t} = \gamma_0 + \gamma_1 |RFDI_{avg,t}| + \gamma_2 RFDI_{avg,t}^2 + \epsilon_{i,j,t} \tag{9}$$

Variables defined as above.

If there is herding, the coefficient,  $\gamma_2$ , will be negative indicating lower deviation from the market and therefore herding.

Looking at table 10, column (1) we can see that although the dependent variable for the lower tail dummy,  $FDID_{i,j,t}$ , has the expected negative sign, albeit not statistically significant. Similarly, in column (2) of Table 10, we observe a negative sign for the  $RFDI_{avg,t}^2$ , albeit also not statistically significant.

When considering changes in FDI flows in dollar amounts, on some occasions there are huge variations (or percentage changes year on year) which are often due to single very large transactions (especially the mergers and acquisitions segment within the FDI flows). These outliers can distort the overall picture and skew the findings. This is why a method considering the number of investments is more suited to this type of data.

To address this, we estimate eqs. (6–9) using numbers of countries investing in the host FDI country. The variables are defined as above with the annual percentage change in the number of countries j investing in country i at time t. We present the results for this analysis in columns (3) and (4) of Table 10. We can see that in column (3), for the CSSD specification, the lower percentile (5th percentile) is statistically significant and negative, as expected, to indicate herding. This is consistent with our findings in the main section that herding is more pronounced when FDI is decreasing in a country or put differently, when countries are divesting. The upper tail, (95th percentile) is positive and significant which indicates no herding. This is also consistent with the argument that asymmetric information is lower when there are a lot of investments (such as the frequency of investing in the 95th percentile) and therefore FDI investors herd less. Broadly, these findings are consistent with the main analysis and our conclusions do not change.

5.5.2. Additional analysis of country governance

In terms of robustness of the governance variables, we note that due to high correlation between the six governance variables, we cannot put them together in one regression. we use three additional variables that measure governance. First we develop an index comprised of the average of all six governance indicators (as defined above in the data

**Table 9**  
Determinants of dollar volume herding in FDI inflows.

	(1)	(2)	(3)	(4)	(5)	(6)
C	3.160*** (0.000)	3.222*** (0.000)	2.991*** (0.000)	2.976*** (0.000)	2.977*** (0.000)	2.898*** (0.000)
(Log) GDPrec	-0.132*** (0.000)	-0.147*** (0.000)	-0.129*** (0.000)	-0.125*** (0.000)	-0.129*** (0.000)	-0.126*** (0.000)
(Log) GDP send	-0.015*** (0.000)	-0.015*** (0.000)	-0.015*** (0.000)	-0.013*** (0.000)	-0.014*** (0.000)	-0.012*** (0.001)
Openness rec	-0.271*** (0.000)	-0.246*** (0.000)	-0.290*** (0.000)	-0.256*** (0.000)	-0.281*** (0.000)	-0.271*** (0.000)
Openness send	-0.014* (0.089)	-0.015* (0.083)	-0.013 (0.138)	-0.010 (0.225)	-0.011 (0.174)	-0.009 (0.289)
GDP growth rec	2.106*** (0.000)	2.269*** (0.000)	2.735*** (0.000)	2.694*** (0.000)	2.607*** (0.000)	2.573*** (0.000)
GDP growth send	0.326*** (0.004)	0.324*** (0.004)	0.309*** (0.007)	0.315*** (0.005)	0.316*** (0.005)	0.298*** (0.009)
(Log) Distance	-0.004 (0.446)	-0.003 (0.616)	-0.001 (0.825)	0.000 (0.000)	-0.002 (0.740)	-0.001 (0.858)
Voice and Accountability	-0.216*** (0.000)					
Political Stability		-0.211*** (0.000)				
Govern. Effectiveness			-0.105*** (0.000)			
Regulatory Quality				-0.196*** (0.000)		
Rule of Law					-0.116*** (0.000)	
Control of Corruption						-0.126*** (0.000)
N	30,709	30,709	30,708	30,709	30,709	30,709
Adj. R <sup>2</sup>	0.19	0.19	0.18	0.19	0.18	0.19

The dependent variable is the dollar volume ratio as defined in eq. (3). The explanatory variables are as follows: log of the GDP of the FDI-receiving country; log of the GDP of the FDI-sending country; trade openness (exports plus imports over GDP) of the FDI-receiving country; trade openness of the FDI-sending country; GDP growth of both receiving and sending countries; log of the physical distance between countries i and j in kilometres; voice and accountability index; political stability and absence of violence index; government effectiveness; regulatory quality; rule of law; control of corruption. The t-statistics are based on standard errors that have been adjusted for heteroskedasticity using White diagonal standard errors; period fixed effects used; \*, \*\* and \*\*\* stand for significant coefficients at the 10%, 5% and 1% level respectively; p-values are in brackets.

**Table 10**  
Alternative herding measures (CSSD and CSAD).

	CSSD (1)	CSAD (2)	CSSD number (3)	CSAD number (4)
Constant	0.299 (0.102)	0.007*** (0.001)	0.003*** (0.000)	0.000*** (0.000)
$FDID_{i,j,t}$	0.061 (0.738)		0.006*** (0.000)	
$FDID_{t,j,t}$	-0.086 (0.637)		-0.0005*** (0.000)	
Abs(FDIchange)		0.002 (0.751)		0.000*** (0.000)
SQ FDIavg,t		-0.0004 (0.883)		0.001*** (0.000)
N	35,537	35,537	35,714	35,714
R <sup>2</sup>	0.000	0.000	0.04	0.07

This table shows two alternative herding measure estimations following Christie and Huang (1995) and Chang et al. (2000). These herding measures and regression specifications are defined in eqs. (6–9). Estimations in columns (1) and (2) are based on annual percentage change in FDI inflows (in dollars) while the estimations in columns (3) and (4) are based on annual percentage change in the numbers of annual FDI investments. The t-statistics are based on standard errors that have been adjusted for heteroskedasticity using White diagonal standard errors; \*, \*\* and \*\*\* stand for significant coefficients at the 10%, 5% and 1% level respectively; p-values are in brackets.

section). They are measured in the same scale and thus, their average captures the global governance picture in the FDI inflows receiving country without distorting the individual measures. In addition to this

variable, we also consider two more: cultural distance index<sup>8</sup> (Hofstede, 1980, Kogut and Singh, 1998) and same country legal origin (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). These variables capture a slightly different but important side of the FDI bilateral pair countries, where if there is similarity between them in terms of organisational culture as well as between institutions, this would create greater familiarity and reduce asymmetric information. In terms of their influence, we expect the governance index to have the same sign as in the main regressions (negative, indicating lower herding where there is better governance in the FDI receiving country); we expect the cultural distance index to have the same mechanism of interpretation as the physical distance variable, i.e. positive, indicating that the greater the cultural distance, the greater the herding; and lastly we expect that the shared country legal origin, which indicates institutional similarity would have a positive sign, indicating that greater institutional similarity reduces asymmetric information and therefore herding.

We estimate the model from eq. (5) in several regressions with these three new variables. The results are presented in Table 11.

Looking at Table 11, we can conclude that the newly added variables have the expected influence on the herding measure and that their interpretation is consistent with the findings from the main regression model (in Table 8). Our conclusions do not change.

<sup>8</sup> The cultural distance index is constructed following Kogut and Singh (1988)

and using the formula:  $CD_{i,j} = \frac{\sum_{d=1}^4 \left\{ \frac{(I_{d,i} - I_{d,j})^2}{V_d} \right\}}{4}$  Where the  $I_{d,i}$  and  $I_{d,j}$  is the individual cultural dimension (d) for country i and j, respectively, and  $V_d$  is the variance of each of the cultural dimensions.

**Table 11**  
Determinants of herding in FDI inflows – robustness variables.

	(1)	(2)	(3)	(4)	(5)
C	0.102*** (0.000)	0.114*** (0.000)	0.080*** (0.000)	0.119*** (0.000)	0.086*** (0.000)
(Log) GDPrec	-0.001** (0.043)	-0.001* (0.088)	0.001** (0.029)	-0.003*** (0.000)	0.001** (0.022)
(Log) GDP send	0.001** (0.018)	0.000 (0.208)	0.001 (0.247)	0.000 (0.320)	0.000 (0.504)
Openness rec	-0.013*** (0.001)	-0.012*** (0.000)	-0.010*** (0.000)	-0.025*** (0.000)	-0.010*** (0.000)
Openness send	0.001 (0.535)	0.000 (0.692)	0.000 (0.898)	0.000 (0.692)	0.000 (0.941)
GDP growth rec	0.263*** (0.000)	0.257*** (0.000)	0.175*** (0.000)	0.241*** (0.000)	0.172*** (0.000)
GDP growth send	0.013 (0.381)	0.018 (0.234)	-0.015 (0.490)	0.020 (0.293)	-0.013 (0.540)
(Log) Distance	0.004*** (0.000)	0.003*** (0.000)	0.003*** (0.000)	0.004*** (0.000)	0.003*** (0.000)
Average Governance Variables	-0.030*** (0.000)	-0.031*** (0.000)	-0.029*** (0.000)		-0.030*** (0.000)
Cultural Distance Index			0.002*** (0.000)	0.001** (0.013)	0.002*** (0.000)
Same Country Legal Origin		-0.012*** (0.000)		-0.006*** (0.000)	-0.007*** (0.000)
N	30,709	30,421	22,413	29,451	22,413
Adj. R <sup>2</sup>	0.07	0.07	0.06	0.06	0.06

The dependent variable is the herding measure as defined in eq. (1). The explanatory variables are as follows: log of the GDP of the FDI-receiving country; log of the GDP of the FDI-sending country; trade openness (exports plus imports over GDP) of the FDI-receiving country; trade openness of the FDI-sending country; GDP growth of both the receiving and sending countries; log of the physical distance between countries *i* and *j* in kilometres; a joint governance variable (average from the six individual measures); cultural distance index and same country legal origin. The *t*-statistics are based on standard errors that have been adjusted for heteroskedasticity using White diagonal standard errors; period fixed effects used; \*, \*\* and \*\*\* stand for significant coefficients at the 10%, 5% and 1% level respectively; *p*-values are in brackets.

## 6. Conclusion

To our knowledge this is the first paper studying herding in corporate decisions of foreign direct investors. We use a rich database from 36 OECD member countries and >100 countries engaging in foreign direct investments in them over a period of 38 years. We find strong empirical evidence of herding in corporate decisions for foreign direct investments. In fact herding in corporate decisions is higher than that observed in portfolio decisions as shown in LSV (1992) for equities and comparable to Cai et al. (2018) for bonds. In equity and bond markets, exit strategies for investors are much less costly than in FDI, yet we show corporate managers are not intimidated by the hardship in exit strategies and herd. We study divestures and the dollar volumes in herding separately as herding can be harmful if corporate managers herd in leaving the host country. We show that herding in foreign capital is mostly beneficial to the receiving countries through investment rather

than being destructive through divestures. Our main policy implication is towards encouraging FDI both for host countries and corporate decision makers.

### CRediT authorship contribution statement

**Mario Levis:** Conceptualization, Methodology, Formal analysis, Writing – original draft. **Yaz Gulnur Muradoglu:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing. **Kristina Vasileva:** Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft, Writing – review & editing.

### Data availability

Data will be made available on request.

## Appendix 1. FDI-inflow-receiving countries' average herding measures and number of inflows from sending countries across all years

FDI-inflow-receiving country	Average herding measure per FDI-receiving country	Total number of FDI inflows from sending countries to FDI-receiving country across all years (1981–2018)
Canada	0.197	130
Israel	0.101	152
Latvia	0.038	247
Switzerland	0.107	407
Lithuania	0.030	456
Chile	0.089	487
Norway	0.030	495
Iceland	0.104	649
Austria	0.069	714
New Zealand	0.106	740
Australia	0.065	781
Finland	0.087	863
Slovak Republic	0.063	983
Turkey	0.243	1007

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FDI-inflow-receiving country	Average herding measure per FDI-receiving country	Total number of FDI inflows from sending countries to FDI-receiving country across all years (1981–2018)
Slovenia	0.072	1012
Japan	0.098	1120
Ireland	0.087	1146
Spain	0.093	1153
Greece	0.078	1236
Portugal	0.052	1242
Estonia	0.071	1282
United Kingdom	0.068	1316
Belgium	0.068	1404
Czech Republic	0.062	1444
Luxembourg	0.067	1462
Sweden	0.266	1536
Denmark	0.103	1555
Mexico	0.170	1722
Hungary	0.082	1785
Korea	0.203	1800
Netherlands	0.035	1872
Poland	0.055	1879
United States	0.058	2439
Italy	0.094	2664
France	0.031	2684
Germany	0.086	3090

### Appendix 2. Average herding measures according to GDP quintile rank

FDI-inflow-receiving country	Average herding measure	Average GDP of rec. Country in \$US million	Quintiles by GDP (average across all years)	Quintiles by GDP (calculated per year)
United States	0.058	13,490,438	5	5
Japan	0.098	5,550,946	5	5
Germany	0.086	3,153,594	5	5
France	0.031	2,334,052	5	4.87
United Kingdom	0.068	2,234,801	5	4.53
Italy	0.094	2,064,706	5	4.54
Canada	0.197	1,386,830	5	3.95
Spain	0.093	1,117,128	4	3.87
Australia	0.065	953,854	4	3.55
Mexico	0.170	932,214	4	3.68
Korea	0.203	916,310	4	3.36
Turkey	0.243	849,559	4	3.34
Netherlands	0.035	787,026	4	3.40
Switzerland	0.107	537,600	4	3.06
Belgium	0.068	485,415	3	3
Poland	0.055	466,521	3	2.58
Sweden	0.266	438,808	3	2.66
Austria	0.069	382,620	3	2.57
Norway	0.030	375,631	3	2.40
Denmark	0.103	309,139	3	2.16
Greece	0.078	276,470	3	2.33
Israel	0.101	268,668	2	1.96
Chile	0.089	237,147	2	2.08
Ireland	0.087	223,561	2	1.66
Finland	0.087	222,697	2	1.41
Portugal	0.052	214,745	2	1.50
Czech Republic	0.062	202,562	2	1.64
Hungary	0.082	135,520	2	1.16
New Zealand	0.106	132,616	1	1.14
Slovak Republic	0.063	87,510	1	1
Luxembourg	0.067	50,620	1	1
Slovenia	0.072	49,588	1	1
Lithuania	0.030	45,377	1	1
Latvia	0.038	28,941	1	1
Estonia	0.071	22,234	1	1
Iceland	0.104	13,126	1	1

### Appendix 3. Average herding measure according to trade openness quintile rank

FDI-inflow-receiving country	Average herding measure	Average openness to trade per rec. Country	Quintile by openness to trade (average across all years)	Quintile by openness to trade (calculated per year)
Luxembourg	0.079	2.976	5	5.00
Lithuania	0.031	1.685	5	4.67
Belgium	0.067	1.563	5	5.00
Slovak Republic	0.057	1.543	5	5.00
Estonia	0.069	1.501	5	4.81
Hungary	0.074	1.438	5	4.68
Ireland	0.109	1.430	5	5.00
Slovenia	0.077	1.428	4	4.00
Latvia	0.040	1.369	4	4.00
Netherlands	0.040	1.083	4	4.79
Czech Republic	0.080	1.060	4	3.88
Switzerland	0.125	1.039	4	4.52
Iceland	0.114	0.992	4	4.35
Austria	0.113	0.932	4	4.19
Israel	0.105	0.824	3	2.22
Chile	0.096	0.776	3	2.15
Denmark	0.106	0.769	3	3.92
Poland	0.056	0.751	3	2.88
Sweden	0.171	0.727	3	3.66
Korea	0.171	0.705	3	3.24
Finland	0.071	0.610	3	3.35
Norway	0.044	0.641	2	3.64
Germany	0.095	0.597	2	2.74
Portugal	0.065	0.570	2	2.61
Canada	0.203	0.566	2	2.95
Greece	0.087	0.551	2	1.63
United Kingdom	0.059	0.516	2	2.29
Italy	0.090	0.474	2	1.51
New Zealand	0.108	0.549	1	2.51
France	0.030	0.474	1	1.66
Spain	0.097	0.463	1	1.61
Turkey	0.215	0.459	1	1.00
Mexico	0.135	0.437	1	1.56
Australia	0.070	0.356	1	1.03
Japan	0.125	0.273	1	1.00
United States	0.054	0.263	1	1.00

#### Appendix 4. Average herding measure according to GDP growth quintile rank

FDI-inflow-receiving country	Average herding measure	Average GDP growth of rec. Country in percent	Quintile by GDP growth (average across all years)	Quintile by GDP growth (calculated per year)
Korea	0.171	0.059	5	4.52
Ireland	0.109	0.050	5	3.94
Turkey	0.215	0.046	5	4.04
Poland	0.056	0.042	5	4.31
Slovak Republic	0.057	0.040	5	4.12
Israel	0.105	0.037	5	4.56
Chile	0.096	0.035	5	3.92
Estonia	0.069	0.034	4	3.88
Lithuania	0.031	0.032	4	3.83
Australia	0.070	0.031	4	3.55
Latvia	0.040	0.030	4	3.67
Iceland	0.114	0.027	4	3.26
Czech Republic	0.080	0.026	4	3.19
United States	0.054	0.027	3	3.05
New Zealand	0.108	0.026	3	3.00
Mexico	0.135	0.025	3	3.15
Luxembourg	0.079	0.025	3	2.92
Canada	0.203	0.024	3	2.84
Hungary	0.074	0.024	3	3.26
Spain	0.097	0.023	3	3.03
Sweden	0.171	0.022	3	2.66
Finland	0.071	0.023	2	3.03
United Kingdom	0.059	0.022	2	2.58
Netherlands	0.040	0.021	2	2.58
Austria	0.113	0.019	2	2.43
Slovenia	0.077	0.018	2	3.00
Switzerland	0.125	0.018	2	2.15
France	0.030	0.018	2	2.18
Norway	0.044	0.025	1	2.72
Japan	0.125	0.019	1	2.35
Portugal	0.065	0.019	1	2.68

(continued on next page)

(continued)

FDI-inflow-receiving country	Average herding measure	Average GDP growth of rec. Country in percent	Quintile by GDP growth (average across all years)	Quintile by GDP growth (calculated per year)
Denmark	0.106	0.018	1	2.26
Germany	0.095	0.018	1	2.13
Belgium	0.067	0.015	1	2.18
Italy	0.090	0.012	1	1.59
Greece	0.087	0.005	1	2.25

## Appendix 5. Correlations among regression variables

Correlations among regressors	Herding measure	Dollar volume herding measure	Log (GDPrec)	Log (GDPSend)	Openness (rec)	Openness (send)	GDP growth rate (rec)	GDP growth rate (send)	Log (Distance)
Herding measure	1.00								
Dollar volume Herding measure	0.02	1.00							
Log(GDPrec)	0.02	-0.10	1.00						
Log(GDPSend)	0.01	0.01	-0.06	1.00					
Openness(rec)	-0.07	0.05	-0.58	-0.09	1.00				
Openness(send)	0.01	0.08	-0.05	-0.34	0.22	1.00			
GDP growth rate (rec)	0.05	0.13	-0.12	0.06	0.08	0.00	1.00		
GDP growth rate (send)	0.01	0.02	0.03	-0.07	0.01	0.07	0.20	1.00	
Log(Distance)	0.05	-0.01	0.16	-0.04	-0.08	-0.10	0.01	0.11	1.00
Correlations among regressors continued		Voice and Accountability	Political Stability	Govern. Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption		
Voice and Accountability		1.00							
Political Stability		0.78	1.00						
Govern. Effectiveness		0.82	0.63	1.00					
Regulatory Quality		0.84	0.64	0.87	1.00				
Rule of Law		0.87	0.68	0.95	0.90	1.00			
Control of Corruption		0.84	0.62	0.95	0.89	0.95	1.00		

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