Segmented Financial Integration

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Abstract

This paper studies the micro-origins of international financial integration by constructing a firm-level dataset covering the near-universe of cross-border financial operations in France. We document two novel facts. First, financial internationalization is carried out by less than 1% of firms—a stronger selection than trade. Second, it is sharply segmented: firms in the bottom 99th percentile primarily raise foreign funds from a single country, whereas firms in the top 1st percentile both raise funds and invest globally using a broad set of instruments. We use these facts shed light on three central questions in international finance: (i) firms become financially internationalized primarily to raise foreign equity—rather than for trade purposes or invest abroad—reducing reliance on domestic bank lending and lowering their cost of capital; (ii) top 1 percent firms operate globally with no evidence of gravity forces or institutional and currency biases; and (iii) exogenously identified idiosyncratic shocks to large agents trigger capital flows that affect bilateral exchange rates.

Keywords: capital flows, cross-border investment, granularity, IIP, exchange rates, FDI.

JEL classification: F31, F32, F36, G15, F44.

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1 Introduction

Over the past decades, cross-border financial positions have expanded dramatically, reaching unprecedented levels. Yet we know remarkably little about the microeconomic structure of financial internationalization. A key obstacle is the absence of consolidated microdata on cross-border financial operations. As a result, existing research studies individual components—such as foreign direct investment or securities holdings—or focuses on specific margins of financial internationalization, either investing or funding. In this paper, we construct a novel micro-level dataset covering the near universe of France's cross-border financial operations between 2014 and 2018 and use it to study the micro origins of international financial integration.

International financial operations constitute the financial counterpart of international trade. Financial operations span a wide range of cross-border financial activities—such as foreign direct investment, portfolio investment, other investment, derivatives and official reserves—and involve a diverse set of agents, including corporations, banks, other financial intermediaries and government.[1] Given their confidential and heterogeneous nature, data on cross-border financial activities is produced in a decentralised fashion by different official authorities.[2] This paper merges 12 different administrative datasets to construct the first dataset of cross-border financial operations at the firm level. Our dataset reports for corporations and financial intermediaries (such as banks, mutual funds, hedge funds, among others): the instrument, position type (asset/investing or liability/funding), currency, country of destination/source for direct investment (equity capital, inter-company loans and reinvested earnings), portfolio investment (listed shares and bonds) and other investment (trade credit, loans and cash and deposits) and creates a agent-instrument level dataset that aggregates precisely to the national statistics.[3] By doing so, we open the "black box" of international financial operations at the micro level, in the same way that the trade literature has done for goods' flows.

We document two facts showing large cross-sectional heterogeneity in firms' financial internationalization. Our first fact is that financial internationalization is channeled by a small group of financial and non-financial firms constituting less than one percent of firms in the economy, a higher selection than trade—carried out by five percent of firms. Our second fact is that the cross-section of firms'

[1] Households typically do not participate directly in cross-border financial operations and engage through financial intermediaries. For example, households account for two percent of cross-border portfolio investment assets.

[2] Data in financial flows are collected by different national agencies, which then compute semi-aggregates to produce national statistics. These statistics only report at country level a basic description of cross-border financial operations and sectors. This contrasts with international trade flows, which are systematically recorded by customs authorities and therefore readily available in a consolidated dataset.

[3] Direct Investment (DI), Portfolio Investment (PI), Other Investment (OI) account for 86% of France's cross-border financial positions, being the remaining 14% derivatives and official reserves. In general, DI, PI and OI are the most important components of a country's International Investment Position. According to data from Lane and Milesi-Ferretti (2021), they account for 88% in the U.S., 92% in Germany, 87% in Japan, 77% in the UK of gross international investment positions between 2005 and 2020.

international financial activities is segmented into two distinct patterns of internationalization. On one side, the vast majority of firms—those in the bottom 90th percentile of the cross-border position distribution—engage in international finance almost exclusively to raise foreign funds from one country. On the other side, the largest firms—the top 1 percent, comprising both financial and non-financial firms—engage in both cross-border investment and funding, operate across multiple countries, and use the full range of financial instruments.

We then use these new facts to ask whether they question our view of international finance along three central questions: how firms internationalize, which factors limit cross-border operations, and how cross-border allocations affect exchange rates. First, we show that firms' financial internationalization is largely unrelated to international trade, as commonly assumed. Instead, firms becoming financially internationalized do so to access cheaper foreign funding to expand investment, adjusting their capital structure by substituting domestic bank credit with foreign equity. Second, we show that the gravity forces, and institutional quality and currency biases in cross-border allocations documented in cross-country studies are driven by firms in the bottom 99th percentile, as firms in the top 1 percent exhibit little evidence of such biases; correspondingly, most firms are less internationalized than previously assumed, while large firms are more internationalized than suggested in the literature. Third, we provide causal evidence that the concentration of cross-border financial investment among a small number of agents has macroeconomic consequences: idiosyncratic shocks in France to these agents propagate internationally and affect bilateral exchange rates with destination economies.

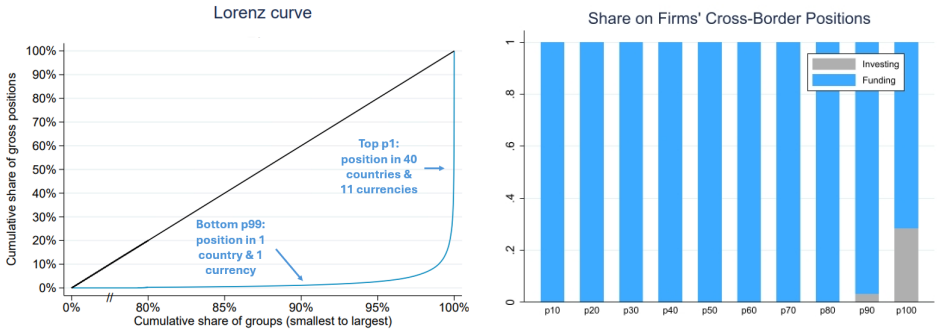
France is a highly internationalized economy: its gross international investment position (IIP) increased from 300% to 700% between 2000 and 2023, and reports financial operations with 209 countries in 169 currencies.[4] Yet of more than 3.2 million of firms active in France in 2014, only 0.8% reported having cross-border financial positions (*Fact 1*). These agents—corporations and financial groups—were nine times larger than the average agent in France (and more than three times larger than the average firm in trade) and accounted for almost 70% of assets in the domestic economy. Within the top 1% of firms operating internationally, there is also high concentration. The top 1st percentile of groups accounts for 93% of the gross volume of operations in our sample, while the bottom 99th percentile account for only 7% (left panel of Figure 1), a concentration that exceeds that observed in trade and at the macro level.[5] A counterfactual exercise shows that if all firms had the same cross-border position than the median firm, France's gross IIP in 2014 would drop from 347% of GDP to 1%.

The financial internationalization pattern differs markedly between the largest and the bottom 90th

[4]For comparison, the gross IIP of the U.S. was 373% by 2020, according to data from Lane and Milesi-Ferretti (2021).

[5]The top 100 groups (top 1st percentile) account for 89% (93%) of the financial flows in our dataset, whereas the analogous concentration in trade is only 33% of trade flows (71%). In macro, Gabaix (2011) reports that the top 100 firms account for 30% of U.S. GDP.

Figure 1: France's Financial Internationalization



Notes: Left panel presents the Lorenz curve of individual groups' gross cross-border positions, comparing the cumulative contribution of smaller and larger groups ranked by GIIP size. Right panel reports the composition of firms' cross-border positions by size, distinguishing investing and funding activities. Period 2014-2018.

percentile groups (*Fact 2*). As shown in the right panel of Figure 1, the largest groups engage in both investing (assets) and funding (liabilities) activities cross border, whereas bottom groups only report foreign funding, without holding any foreign investment.[6] These differences are also reflected in the geographic and currency scope of firms' international positions. Firms in the top 1 percentile hold positions, on average, in 40 countries and 11 currencies, whereas firms in the bottom 99 percentile typically operate in only a single country and currency. This segmented pattern appears both among corporations and financial groups.[7] These largest groups are also complex firms that hold a broad range of instruments—listed and non-listed equity, bonds, trade credit, and bank loans—and exhibit complementarity in their cross-border activities by investing and raising funds in 37% of the countries in which they operate. By contrast, bottom-99 firms report almost exclusively non-listed equity funding from typically only one country. This predominance of foreign funding as their main mode of internationalization is striking in view of the neoclassical framework that would predict that a typical firm in a capital-abundant economy—such as France, located in the 90th percentile of the global distribution—should instead export capital to the rest of the world.

In our first application, we uncover how firms internalize financially by focusing on the extensive margin—specifically, the decision to undertake a cross-border financial operation for the first time. We therefore examine firms with no prior cross-border financial positions that decide to become financially internationalized. Entry into international financial activities is dominated by non-listed corporations, which become financially internationalized almost exclusively by raising foreign non-public equity (93%

[6]Following national accounts methodology, we consider foreign investment as foreign assets (capital outflows) and foreign funding as liabilities (capital inflows), and we treat both interchangeably in the remainder of the paper.

[7]The top 1 percent of both corporations and financial groups maintain positions across virtually the entire world, while the median corporate firm or financial group holds positions in only one country (Figure B.1 in Appendix B).

of cases) from strategic (non-financial) investors and rely on this single instrument in nearly all instances. These firms are medium-large, high productivity firms with on average 118 employees with higher investment rates and more leveraged than firms that never internationalize financially. We show that, upon financial internationalization, these firms reduce their domestic bank credit-to-assets ratio (5%) and interest payments (11%), and expand their fixed assets (3%) and employment (1%). Their financial internationalization does not appear to be driven by international trade, as these firms typically do not engage in international trade (77% of cases) and do not show a higher probability of exporting after their internationlization. Instead, newly internationalized firms that also export reallocate their sales towards the domestic market, decreasing their export shares. These patterns point to a financial internationalization channel through which firms seek to reduce their reliance on the domestic banking system and to access a broader pool of funds. In doing so, firms adjust their capital structure—by substituting domestic bank debt with foreign equity—to lower their cost of capital and to increase investment. To rationalize this internationalization pattern, we develop a simple framework based on the pecking-order theory of capital structure applied to an international setting and show that its main implications are supported by our data. Lastly, we distinguish between firms that retain domestic control—defined as firms with more than 50% domestic ownership—and firms cede control to foreign investors, for which foreign ownership exceeds 50%. Firms that cede control to foreigners are substantially smaller and account for only small fraction of equity investment, sales and assets of newly internationalized firms. In line with the internationalization channel, they are initially more leveraged and after their internationalization decrease by more their domestic bank leverage and cost of capital.

In our second application, we show that the gravity forces, and institutional quality and currency biases in cross-border allocations documented in cross-country studies affect firms heterogeneously. These biases decline with size and disappear entirely for the largest firms. In particular, we compute the share that each firm allocates by instrument in each country and year, and show that the allocations of the top 1st percentile do not correlate with the currency of the operation, gravity forces (distance nor GDP), EU membership, country's institutional quality, common language, common colonial history, or common legal system. Neither corporations and financial groups in the top 1 percentile exhibit such biases in either their investment or funding activities, or across financial instruments. By contrast, gravity factors, and currency and institutional-quality biases remain pervasive among the rest of firms and are stronger for smaller firms. Operating in euros increases the allocated share by 21% for firms in the bottom 90 percentiles. GDP and institutional-quality effects display a similar gradient. Hence, while the largest firms operate globally with little exposure to institutional, currency, and gravity factors, smaller firms are far more affected than previously recognized in cross-country studies.

Our last application shows causal evidence that the concentration of cross-border financial invest-

ment activities in a small group of large agents has consequences for the exchange rate, as their idiosyncratic shocks do not average out. Focusing on banks, we leverage from the French credit registry data, reporting firm-bank credit relationships at monthly frequency and apply the Amiti and Weinstein (2018) methodology to isolate bank-specific shocks in France.[8] Using these shocks as instruments, we estimate monthly bilateral fitted flows from banks to 132 destination countries and test whether they affect their bilateral exchange rates. Our instrument satisfies both the exogeneity assumption and exclusion restriction: bank-specific disturbances are identified within France and are orthogonal to aggregate shocks in France. It also satisfies the relevance assumption: our country-specific, fitted financial flows explain about a third of the variation of countries' aggregate financial flows compared to official statistics. We find that favorable idiosyncratic shocks to banks in France—corresponding to expansions—trigger capital inflows in destination countries that lead to exchange rate appreciations of the destination country's currency. This effect is driven by granular banks (those in the top 1st percentile) and is stronger in destinations where they account for a large share of the overall currency demand.

Related Literature. Our paper relates to the international finance, trade and macro literature emphasizing the importance of studying firm heterogeneity and the salient role of large firms to understand aggregate fluctuations. The international finance literature highlights that only large firms can issue securities in foreign markets (Maggiori, Neiman, and Schreger 2020) and borrow in foreign currency (Salomao and Varela 2021). The trade literature has shown large concentration of trade in the France. di Giovanni, Levchenko, and Rancière (2011) document that French export flows follow a power-law distribution, and di Giovanni, Levchenko, and Mejean (2018) show that foreign shocks transmit to the the French economy through the trade linkages of the largest French firms. Gaubert and Itskhoki (2021) show that granular firms shape about a quarter of export variation within sectors in France. The macro literature has also documented the importance of granular firms in shaping aggregate fluctuations (Gabaix 2011, di Giovanni, Levchenko, and Mejean 2014, Carvalho and Grassi 2019, among others). Our paper uncovers for the first time the micro origins of international financial operations and reveals an even sharper segmentation cross-section of firms than that observed in trade and macro.

Our paper also relates to the foreign direct investment (FDI) and multinational corporations (MNC) literature that has extensively studied MNC decisions to establish foreign subsidiaries and invest cross-borders (Bernard, Jensen, Redding, and Schott 2009, Antràs and Yeaple 2014, Ramondo, Rappoport, and Ruhl 2013, Ramondo, Rodriguez-Clare, and Tintelnot 2015, among others). Rather than focusing

[8] We focus on banks as identifying idiosyncratic shocks and their impact on the exchange rate requires high frequency data, which is unavailable for corporations. However, there is anecdotal evidence illustrating the influence of large corporations on exchange rates. For example, following the FDA's June 2021 approval of Wegovy for chronic weight management, substantial foreign capital flowed into Denmark to purchase Novo Nordisk shares. These inflows placed upward pressure on the Danish krone that led the central bank to lower the domestic interest rate to maintain the peg with the euro (The Guardian, 9 September 2023).

on the investing firm, we study recipient firms and highlight the role of foreign equity in their financing decisions. Our paper is thus closest to Antràs, Desai, and Foley (2009) showing that financial frictions in destination countries deepens FDI flows and to Manova, Wei, and Zhang (2015) showing that foreign affiliates have better export performance than domestic firms in financially vulnerable sectors. Our microdata allow us to examine this channel more closely and to show that recipient firms typically do not engage in international trade and their internationalisation is consistent with adjustments in the capital structure to reduce their cost of capital.

This paper relates to a large literature studying the frictions that shape cross-border equity flows. Portes and Rey (2005) show that gravity variables—and distance in particular—play a central role in driving cross-border these flows, while Portes, Rey, and Oh (2001) argue that informational asymmetries provide the underlying mechanism through which distance limits them. In a similar vein, Martin and Rey (2004) demonstrate that market size acts as a gravity force in international asset trade, with larger markets attracting disproportionately more capital. Maggiori, Neiman, and Schreger (2020) use security level data on mutual funds and exchange traded funds to document strong home-currency bias in securities holdings. Reinhart and Rogoff (2004) and Alfaro, Kalemli-Ozcan, and Volosovych (2008) show that institutional quality shapes cross-border aggregate capital flows. Papaioannou (2009) provides evidence that proximity and size critically shape cross-border bank flows. Our paper reassesses this question (i) by consolidating all agents of cross-border financial operations and (ii) for the universe of firms participating in international financial activities—corporations, banks and other financial intermediaries. By doing so, we uncover substantial heterogeneity in the cross-section of firms: the largest firms operate cross-border with little evidence of biases or gravity forces, whereas these factors are far more pervasive for the majority of firms than previously documented in the literature.

Our finding that shocks to granular banks propagate across countries and affect exchange rates in destination economies relates to the literature on global financial intermediaries, whose behavior in segmented capital markets plays a central role in exchange rate dynamics (Gabaix and Maggiori 2015; Itskhoki and Mukhin 2025; Gourinchas, Ray, and Vayanos 2025; Barbiero, Bräuning, Joaquim, and Stein (2024), among others). Rather than focusing on balance sheet risk constraints, we identify banks' idiosyncratic supply shocks in France and trace how they trigger capital flows that affect exchange rates in destination economies. By examining 132 currencies, our analysis extends beyond advanced economies and shows that these effects are stronger for smaller currencies.

The paper is structured as follows. Section 2 describes the data. Section 3 documents our first and second facts. Section 4 characterizes newly financially internationalized firms. Section 5 studies the factors affecting cross border allocations in the cross-section of firms. Section 6 assesses the impact of segmentated financial integration on exchange rates. The last section concludes.

2 Data

This section describes the data sources and provides summary statistics. Full description of the data can be found in Appendix A.

-Data on cross-border financial operations. Our dataset provides detailed information on the cross-border financial positions of the public sector and private financial and non-financial agents, vis-à-vis all countries worldwide between 2014 and 2018. For each position involving a French resident and a foreign one, the data record the agent, instrument, currency, country of destination or source and the type of stock (i.e., whether the position is classified as an investing/asset or a funding/liability).

We construct our dataset by collecting, harmonizing and merging 12 different micro-level datasets used to produce France's IIP, compiled by the Banque de France and complemented with data from the French National Statistical Institute (INSEE). Given the diverse nature of cross-border financial operations and the range of economic agents involved, official statistics are collected by specialized units using distinct data-collection methods. In practice, no single unit has access to the full set of microdata. Being the first time these dataset have been put together consistently to be used for academic research, a key step has been to harmonize the 12 micro-datasets into a format consistent with the international accounts, thereby creating a detailed micro-level dataset that aggregates precisely to the IIP statistics.

Table 2 in Appendix A presents France's IIP over the period under analysis. The IIP is the stock counterpart of the financial account of the BOP and, therefore, has the five components: Direct Investment (DI), Portfolio Investment (PI), Other Investment (OI), Financial Derivatives and Official Reserves. The first three components—DI, PI, OI—account in general for the bulk of gross IIP and for 86% in the case of France. In this paper, we focus on these three components and leave the analysis of cross-border derivatives for further research.

Our direct investment data include equity capital, reinvested earnings and inter-company loans.[9] Our portfolio investment data comes from the French chapter of the Security Holdings Statistics (SHS) database, collected at the security level for all euro zone countries and put together by the European Central Bank. For PI liabilities, we observe the individual identifiers of issuers, which allows us to reconstruct the portfolio issuance of all French residents held by non-residents and match it exactly with national account statistics. For PI assets, security-level data are available for all holdings, but agent-level attribution is available only for banks. For the remaining agents (corporations, households, and other non-bank financial institutions), PI asset data can only be traced to the institutional sector level. Using the SHS at the sector level, we checked the shares of portfolio assets directly held by corporations,

[9] Following the national statistic convention as defined by the BOP and IIP Manual (BPM6), a DI relationship is established when foreign ownership of French assets, or French ownership of foreign ones surpasses a 10% threshold.

households and other non-bank financial institutions. The shares directly held by corporations and households are less than 3%, and the bulk of the portfolio asset data not covered by our micro dataset arises from investment funds and insurance companies.[10] Therefore, our results provide a lower bound for the gross positions of granular agents, especially those of financial groups. Importantly, this does not affect the segmentation patterns presented below, but the absence of micro-level data of security assets for investment funds and insurance companies overestimates the share of liabilities of granular financial groups. This will be reflected in column 5 of panel C in Table 4 and is discussed in that section. Our other investments data includes the cross-border positions on loans and deposits, repurchasing agreements (repo), other accounts payable/receivable, trade credit, and other financial debt between non-affiliated firms. In the subsequent analysis, we restrict the sample to private groups, excluding the French government and national agencies, which are only included in Table 3 for comparative purposes. We define a group as a collection of legal entities that have common ownership.

-Other datasets. We also leverage from two other datasets collected by the Banque de France: (i) balance sheet and income statement data from the FIBEN (Fichier Bancaire des Entreprises) to gather information on corporations, and (ii) matched bank-firm data for domestic loans from the French National Credit Register that we use to identify bank idiosyncratic shocks in France.

-Summary statistics. Compared with national accounts our agent-level data accounts for 77% of gross positions (i.e., sum of assets and liabilities), 62% of assets & 90% of liabilities of DI, PI and OI for the period 2014-2018 (Figure B.2 in Appendix B). The lower asset share reflects limitations in attributing portfolio investment assets to non-bank resident agents.

As shown in Panel A of Table 1, we identify an average of 38,013 private groups reporting cross-border financial operations between 2014 and 2018. Panel B reports summary statistics on the firm-level distribution of France's Gross IIP (GIIP), which is highly skewed toward large groups. In 2014, the gross position of the 99th-percentile group amounted for 1.31 billions of euros, which was 1,680 times larger than that of the median group and 252 times larger than that of the 75th-percentile group. This concentration is present in both corporations and financial groups, and investing and funding activities.

[10] Foreign holdings of corporations and household through asset managers are more difficult to trace because of the absence of administrative data and confidentiality reasons, and it is out of the scope of the paper. For a deep analysis on these flows see Coppola, Maggiori, Neiman, and Schreger (2021). PI assets of investment funds and insurance companies account for 28% and 36% of total PI assets, respectively.

Table 1: Summary Statistics

	Panel A. Number of Groups					
	2014	2015	2016	2017	2018	2014-18
Number of groups	35,178	34,663	39,122	39,142	41,961	38,013
	Panel B. Summary Statistics					
	Mean	1pp	25pp	Median	75pp	99pp
Gross Position	201.6	0.0	0.1	0.8	5.2	1,310.0
Corporations	84.7	0.0	0.1	0.7	4.7	867.4
Financial groups	2,263.0	0.0	0.3	3.3	48.1	11,539.0
Investing/Assets	206.9	0.0	0.1	0.6	4.4	1391.0
Funding/Liabilities	128.2	0.0	0.1	0.7	4.7	952.7

Note: Panel B: In million of Euros. Year 2014.

3 Segmentation in Cross-Border Financial Operations

Section 3.1 documents that cross-border financial operations are channeled through a small group of agents (first fact). Section 3.2 shows firms exhibit markedly different patterns of financial internationalization, leading to segmented cross-border financial integration (second and third facts). We also show that this segmentation is not driven by state-owned firms, asset management firms, the residency definition in the data, or alternative instrument classifications. Finally, Section 4 characterizes newly internationalized firms—those that initially report no cross-border financial activity but subsequently engage in such operations—and assess their performance upon financial internationalization (four fact).

3.1 Fact 1: The Select Few: 1% of Firms Engage in International Finance

Cross-border financial operations are channeled through a small group of large agents. Among the 3.2 million firms in France in 2014, only 0.8% reported any international financial activity (Panel A of Table 2), from which 95% are corporations and the remaining 5% financial groups. This degree of selection is even stronger than the well-documented skew in international trade, where 5.4% of firms trade internationally.

Corporations engaged in international financial operations are an order of magnitude larger than both the average firm in France and the average firm involved in international trade. Panel B shows that they hold nine times more domestic assets than the average French firm and nearly four times more than firms engaged in international trade, while employing over four times as many workers as the typical firm and twice as many as trading firms. Despite being less than 1% of firms in France, they account for 68% of the domestic assets and 36% of employment reported by FIBEN. A similar pattern holds for banks: while two-thirds of banks in France report cross-border financial operations,

they account for 84% of all domestic loans.

Table 2: Firms Engaging in International Financial Operations

	Panel A: Share of Firms			
	France	Int'l Trade	Int'l Financial Operations	
	(1)	(2)	(3)	(4)
Share of firms	100%	5.42%	0.79%	
	Panel B: Relative Size			
	All Corporations in France	Corporations in Int'l Trade	Int'l Financial Operations	
			Corporations	Banks
Value of domestic assets (mean)	20,649	51,661	183,256	
Employment (mean)	40	96	187	
Share on domestic assets	1.00	0.60	0.68	
Share on employment	1.00	0.60	0.36	
Share of banks w/int'l financial operations				0.67
Share on domestic loans				0.84

Note: Year 2014. Value of assets are in thousands of Euros. Source: data on domestic assets and employment comes from FIBEN. Firms in France in 2014: 3.2 million.

The 1% of the Top 1%: Granularity Within Firms Engaging in Cross-Border Finance

In turn, the vast majority of international financial operations are conducted by a small number of large agents. Column 2 of Table 3 shows that the top 100 groups account for 51% of France's gross cross-border positions as reported in official statistics.[11] Expanding the sample to the top 1 percentile increases this share to 58%. Together with the French government and national agencies, they account for 70% of France's cross-border financial positions. Beyond the top decile, the incremental contribution is negligible: firms in the bottom 90th percentile add less than 1% to cross-border positions. This pattern holds for both investing and funding activities (columns 3 and 4).

Financial flows are more skewed than trade flows: the top 100 groups account for 89% of gross financial flows compared with 33% for trade, while the top 1st percentile accounts for 93% of financial flows versus 71% for trade (columns 5 and 6).[12] This concentration is also evident when removing

[11] These categories are mutually exclusive categories based on firms' gross positions: (i) the top 100 groups (corresponding to the top 0.26 percentile of the firm-level cross-border distribution), (ii) the top 1 percentile (above the 99th percentile), (iii) the top 5 percentile (95th-98th percentiles), (iv) the top 10 percentile (90th-94th percentiles), (v) the top 50 percentile (50th-89th percentiles), and (vi) the bottom 50 percentile (1st-49th percentiles). Given that agents engaging in cross-border activities differ widely in nature (corporations, banks, mutual funds, etc.), there is no single measure of size that can be used to rank them. Instead, we rank agents by their gross cross-border financial positions and show later that this ranking is strongly correlated with their size.

[12] To make this comparison, we compute financial flows as year-to-year changes in stocks and estimate each group's share within our dataset, which—for comparability—we compute over our sample rather than official statistics.

financial groups.[13] Table B.3 in Appendix B presents a similar pattern when comparing the number of countries in international finance and trade.

Table 3: Granular Cross-Border Financial Operations

Group rank	Definition	Panel A					
		Number of Groups	Cumulative Share on National Accounts			Comparison w/Int'l Trade Cumulative Share	
			Gross	Investing	Funding	Finance	Trade
		(1)	(2)	(3)	(4)	(5)	(6)
Top 100 groups	Above percentile 99.74	100	0.51	0.50	0.51	0.89	0.33
Top 1 percentile	Above percentile 99	285	0.58	0.56	0.60	0.93	0.71
Top 5 percentile	Percentiles 95 to 98	1,565	0.63	0.61	0.66	0.98	0.90
Top 10 percentile	Percentiles 90 to 94	1,953	0.64	0.61	0.67	0.99	0.95
Top 50 percentile	Percentiles 50 to 89	15,654	0.65	0.62	0.68	1.00	1.00
Bottom 50 percentile	Percentiles 1 to 49	19,561	0.65	0.62	0.68	1.00	1.00
Including French Government and Agencies			0.77	0.62	0.90		
		Panel B: Corporations					
		Share on		Mean		Share on Aggregate	
		# of groups	Value	Employees	Assets	Employees	Assets
Top 100 groups	Above percentile 99.74	0.65	0.31	10,064	35,397	0.06	0.31
Top 1 percentile	Above percentile 99	0.72	0.73	2,801	5,109	0.11	0.42
Top 5 percentile	Percentiles 95 to 98	0.85	0.79	710	924	0.18	0.54
Top 10 percentile	Percentiles 90 to 94	0.91	0.89	405	290	0.23	0.59
Top 50 percentile	Percentiles 50 to 89	0.95	0.92	111	52	0.33	0.66
Bottom 50 percentile	Percentiles 1 to 49	0.97	0.82	40	13	0.36	0.67

Note: Panel A: column 1 presents the number of groups. Columns 2 to 3 report the share of the (absolute value) positions on National Accounts. Column 4 and 5 document the share of gross international flows and gross trade (in sample). *Panel B:* Columns 1 and 2 report the share of corporations in the number of groups and gross value by category. Columns 3 and 4 present averages values of employment and assets (millions of euros) within each category for corporations. Columns 5 and 6 report shares on the National aggregate. Average 2014-18.

Corporations constitute the overwhelming majority of groups and of gross cross-border financial positions across the distribution, except for the top 100 groups—where financial groups dominate in value (69% versus 31% for corporations), as shown in Panel B. This pattern is especially pronounced below the 95th percentile, where corporations account for more than 90% of groups and over 80% of gross value. There is substantial size disparities across firms: corporations in the top 100 groups are vastly larger, employing on average 10,064 workers compared with 40 in the bottom 50th percentile, and holding roughly 2,700 times more assets (columns 3 and 4). Despite being much smaller and accounting for only a small fraction of cross-border financial operations, corporations in the bottom 99th percentile remain economically meaningful in the domestic economy, accounting for 25% of employment and assets (columns 5 and 6).

[13] Corporations belonging to the top 100 groups account for 80% of all corporate financial flows, and those in the top 1st percentile account for 89%. Cross-border financial positions are likewise far more concentrated than sales. For comparison, Gabaix (2011) shows that the top 100 Compustat firms represent roughly 30% of U.S. GDP over 1975–2008.

3.2 Fact 2: Segmentation in Cross-Border Allocations

International financial integration is not only granular, but also segmented, reflecting distinct patterns of internationalization between the largest firms and the rest. These differences are reflected in the types of cross-border operations undertaken, the instruments used, and the geographic allocation of their activities.

Investment and funding activities. There is a sharp contrast in investment (assets) and funding (liabilities) patterns across firms. While firms in the bottom 90th percentile engage exclusively in foreign funding—resulting in an average funding share of 100% of their gross positions—the largest firms engage in both foreign investment and funding, with relatively balanced shares in their gross positions. Funding accounts on average for 56% of positions among the top 100 groups and 64% for the top 1st percentile (column 1 in Table 4).[14] This stark difference between large and smaller firms appears in both corporations and financial groups, as shown in Panels B and C. The largest firms also exhibit complementarity between investment and funding within destination countries: the top 100 groups report both activities in 37% of the countries in which they operate (column 2), whereas bottom firms display no such complementarity as they only raise foreign funds.

Instruments. The internationalization of the largest firms and bottom 90th percentile groups also differs in the financial instruments used in their cross-border operations.[15] Bottom 90th percentile groups rely almost exclusively on equity—firms in the bottom 50th percentile hold all their cross-border positions in equity, while those between the 50th and 89th percentiles hold 92% (column 3). This reliance on equity appears in both corporations and financial groups. Corporations rely almost entirely on non-public equity (100% for the bottom 50th percentile and 93% for the 50th–89th percentiles) (column 4 in Panel B), while financial groups tilt toward public equity, which accounts for more than two-thirds of their equity holdings (columns 4 and 5 in Panel C).

In contrast, the largest groups use the full range of financial instruments. The top 100 groups hold 49% of their positions in equity (26% non-public and 23% public), followed by bonds (38%) and bank credit (10%). Among the largest corporations, equity also dominates—accounting for more than 70% of their positions—with a substantial share in public equity (44% for corporations in the top 100 groups and 22% for the rest of the top percentile). By contrast, the largest financial groups rely primarily on cross-border bonds (64%), followed by bank loans (27%), with only small shares in public equity (7%)

[14] This share of liabilities for the top groups is potentially an upper bound, particularly for financial groups, as we do not observe individual-level securities assets (see Sections 2 and Appendix A for details).

[15] We distinguish five types of financial instruments: (i) **non-listed equity**, including non-listed shares, reinvested earnings, and inter-company loans; (ii) **listed equity**; (iii) **bonds**; (iv) **bank loans**, comprising cross-border loans and other accounts payable/receivable involving at least one financial institution as counterpart; and (v) **trade credit** between corporations.

and non-public equity (2%).

Geography. This segmented pattern is also salient in the number of countries and currencies that firms operate. Firms in the bottom 90th percentile typically hold positions in only one country and currency, which tends to be within the EU and euros. In contrast, the top 100 groups report positions in 80 different countries and in 13 different currencies, and the remainder of the top 1st percentile (excluding the Top 100) hold positions in 30 countries and in 4 different currencies. Both corporations and financial groups display similar patterns, with bottom 90th having positions in only one country and currency (Panels B and C). The distribution of countries and currencies reassemble a power law distribution (Figure B.5 in Appendix B) for both corporations and financial groups (Figure B.6 in Appendix B). As shown in Figure B.4 in Appendix B, 75% of groups have positions in only one country (90% in maximum two countries), and 88% in only one currency.

3.3 Facts 1 and 2: Discussion

Taken together, these findings reveal a sharp segmentation in the cross-sectional patterns of international financial integration. First, cross-border operations are channeled through a small number of corporations and financial groups, accounting for less than 1% of firms and exhibiting greater concentration than trade flows. Second, the vast majority of firms engage in international finance almost exclusively by raising foreign funds—primarily through non-public equity from a single country and currency.

This finding is striking in light with the benchmark neoclassical framework, in which the typical firm in a capital-abundant economy such as France—located in the 90th percentile of the world capital–labor distribution (Figure B.3 in Appendix B)—should instead export capital abroad. Interestingly, their financial internationalization does not appear to be linked to international trade, as most of firms do not engage in it. Table B.3 in Appendix B shows that 70% (and 54%) of firms in the bottom 50th percentile (and the 50th–89th percentiles) report no trade activity—neither exports nor imports. In Section 4, we examine the channels driving bottom firms' financial internationalization and argue that they are linked to the search for cheaper foreign funding.

Furthermore, the strong selection into international financial activities and the segmentation patterns across firm sizes suggest the presence of substantial fixed costs to operating internationally. The fact that only a small number of firms engage in any cross-border financial activity points to a fixed cost of becoming financially internationalized. Moreover, this cost appears higher for investing abroad than for raising foreign funds, as only granular firms hold foreign investment. Fixed costs also seem to differ

Table 4: Segmented Financial Integration

	Number of				Composition of Investment and Funding			Composition across Instruments				
	Countries	Currencies	Non-EU	Non-EUR	Share of Funding	Share of Countries w/I&F	Matching Index	Non-Listed Equity	Share of Listed Equity	Bond	Bank Loan	Trade Credit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: All Groups												
Top 100 groups (≈ top p0.26)	80	13	58	12	0.56	0.37	0.28	0.26	0.23	0.38	0.10	0.03
Top percentile 1 (p99–p99.74)	30	4	16	3	0.64	0.22	0.08	0.45	0.18	0.16	0.16	0.05
Top percentile 5 (p95–p98)	8	2	2	1	0.71	0.04	0.00	0.62	0.09	0.06	0.11	0.12
Top percentile 10 (p90–p94)	4	1	1	0	0.78	0.05	0.00	0.57	0.07	0.03	0.06	0.27
Top percentile 50 (p50–p89)	1	1	0	0	1.00	0.00	0.00	0.88	0.04	0.01	0.02	0.05
Bottom percentile 50 (p1–p49)	1	1	0	0	1.00	0.00	0.00	0.97	0.03	0.00	0.00	0.00
Panel B: Corporations												
Top 100 groups (≈ top p0.26)	86	16	61	15	0.59	0.39	0.28	0.39	0.31	0.25	0.01	0.04
Top percentile 1 (p99–p99.74)	25	4	13	3	0.62	0.20	0.06	0.59	0.17	0.14	0.02	0.08
Top percentile 5 (p95–p98)	5	2	2	1	0.68	0.05	0.00	0.72	0.05	0.03	0.06	0.14
Top percentile 10 (p90–p94)	3	1	1	0	0.75	0.07	0.00	0.61	0.04	0.01	0.04	0.30
Top percentile 50 (p50–p89)	1	1	1	0	1.00	0.00	0.00	0.91	0.02	0.00	0.02	0.05
Bottom percentile 50 (p1–p49)	1	1	0	0	1.00	0.00	0.00	0.99	0.01	0.00	0.00	0.00
Panel C: Financial Groups												
Top 100 groups (≈ top p0.26)	72	11	51	10	0.51	0.34	0.31	0.02	0.07	0.64	0.27	0.00
Top percentile 1 (p99–p99.74)	42	6	29	5	0.68	0.26	0.19	0.10	0.18	0.21	0.51	0.00
Top percentile 5 (p95–p98)	21	2	11	1	0.86	0.03	0.00	0.15	0.25	0.22	0.38	0.00
Top percentile 10 (p90–p94)	7	1	2	0	1.00	0.00	0.00	0.22	0.39	0.17	0.22	0.00
Top percentile 50 (p50–p89)	2	1	0	0	1.00	0.00	0.00	0.33	0.54	0.05	0.08	0.00
Bottom percentile 50 (p1–p49)	1	1	0	0	1.00	0.00	0.00	0.41	0.54	0.01	0.04	0.00

Note: Columns 1 to 4 document the number of countries, currencies, non-EU countries, and non-EUR currencies, respectively, in which groups hold positions. Column 5 reports the share of liabilities on groups' gross positions by category. Column 6 presents the fraction of countries in which a firm has both investment and funding activities. Column 7 presents the value of the matching index weighted by groups' gross positions. Columns 8-12 shows the value share of instrument in groups' gross positions. Average 2014–18.

across instruments. Raising equity from foreign investors faces relatively low barriers, whereas issuing international bonds or securing cross-border bank loans is almost exclusively the domain of large firms, consistent with these instruments involving higher fixed costs.

The granularity in firms' financial internationalization and its segmented pattern across countries and currencies have meaningful implications for France's financial integration. A counterfactual exercise shows that, if all internationalizing firms had the same external position than the typical firm engaging in international financial operations (p50), France's gross IIP would dramatically decline from 347% over GDP to 1% (column 1 of Table B.4 in Appendix B). Its cross-country allocation would also change substantially: only 15% of positions would be with non-EU countries, and only 8% would be denominated in non-euro currencies.[16]

In the next sections, we ask how these findings affect our view on three main questions in international finance: (i) how firms' internationalize financially? (Section 4), (ii) do factors shaping cross-border allocations affect firms heterogeneously? (Section 5), and (iii) does the concentration of cross-border investment in a few agents affect the exchange rate? (Section 6).

3.4 Additional exercises and robustness tests

We conduct a series of robustness exercises to check the validity of our results. We first show that the granularity of cross-border financial operations is not driven by the presence of state-owned firms or asset management firms. Tables B.5 and B.6 in Appendix B show that the Top 100 groups still account for half of gross positions, and the top 1 percentile for 57% when excluding state-owned firms and the top 50 French asset managers (sufficient given the sector's high concentration).

Furthermore, the segmented internationalization patterns are not driven either by state-owned firms and asset managers, as when we remove them our results remain robust (Tables B.8 and B.9 in Appendix B). Analyzing internationalization by type of national account category—Direct Investment, Portfolio Investment and Other Investment—also offers a similar segmentation pattern: firms in the bottom 90th percentile typically have positions in only one category, most often Direct Investment, whereas the largest groups have typically positions in the three categories: direct investment, portfolio investment and other investment (Table B.10 in Appendix B). Lastly, our results are not driven by the residency of our data. We follow Coppola, Maggiori, Neiman, and Schreger (2021) and restate positions in financial centers with ultimate parent's nationality using their restatement matrix.[17] Table B.11 in Appendix B

[16] The results in this table are computed using our firm-level data and France's GDP. Figure B.9 in Appendix B reports France's net IIP based on national accounts data and shows that our data captures well France's aggregate pattern.

[17] Since the restatement matrix is only available for securities assets of the European Monetary System (EMU), we need to make several assumptions in its application. In particular, we assume that (i) positions reported in direct investment and other investment have the same relocation than securities, (ii) liabilities have the same relocation than assets, (iii) France has the same allocation than the EMU, and (iv) all firms share the same relocation patterns.

confirms the segmentation between largest groups and the rest after this restatement.

4 Application I: Characterizing Newly Internationalized Firms

In this section, we assess the forces driving firms to internationalize financially. With this end, we focus on newly internationalized firms—those that initially report no cross-border financial activity but subsequently engage in at least one such flow. We examine the nature of their cross-border activities (Section 4.1), and their performance after financial internationalization (Section 4.2).

4.1 Profile of New Cross-Border Financial Activities

From the 14,388 firms that began engaging in international financial operations between 2015 and 2018 (3,597 firms per year, about 10% of groups operating internationally), 92% were corporations (Table 5). These firms are medium-size firms that entered in the bottom 90th percentile of the distribution of cross-border financial operations (94% of them).

In line with our earlier findings, almost all newly internationalized firms do so to raise foreign funds: 91% report only foreign funding, 7% both raise foreign funds and undertake foreign investment, and only 2.5% invest abroad without raising any foreign funding. Financial internationalization does not seem to be related to international trade, as 77% of newly internationalized firms do not report any trade activity (export or import) and only 2% of firms report cross-border trade credit. Instead, nearly all firms that start engaging in cross-border financial activities rely on a single instrument (98%), which tends to be non-listed equity capital (93%). Entry through bonds (1.4%) or bank loans (3.3%) is rare.

The geographic distribution of their positions further reveals that their counterparts are mainly located in high income countries (and in 80% of cases in the EU). Figure B.7 in Appendix B presents a heatmap with the number of entrants per country and shows that the most partners are USA, Germany, Spain, UK and Italy.

In sum, newly financially internationalized firms are typically corporations that do not engage in international trade and whose internationalization is channelled through non-public equity funding. Table 6 shows that these corporations are larger than the average French firm: they employ four times more workers (118 versus 29), have four times higher sales and assets, and exhibit greater productivity (total revenue factor productivity, TFPR). Notably, they also have higher investment rates (18% versus 14%) and, accordingly, higher leverage, with a debt-to-asset ratio of 55% compared with 48% for the average firm. Higher investment rates and leverage could rationalize their seek for foreign equity funding and, together with the absence of international trade, point to an internationalization motive centered

Table 5: Profile New Cross-Border Financial Activities

(1)		(2)	
By sector		**By type of stock**	
Share of corporations	92.4	Share w/only funding (liabilities)	90.7
Share of non-public corporations	99.5	Share w/only investment (assets)	2.5
Share of financial groups	7.6	Share w/ both funding and investment	6.8
By rank		**By instrument**	
Top 100 groups (Top p0.26)	0.0	Share of groups w/only one instrument	98.4
Top 1 percentile (p99–p99.74)	0.1	Only equity capital	92.8
Top 5 percentile (p95–p98)	2.1	Only non-listed equity capital	99.4
Top 10 percentile (p90–p94)	4.1	Only trade credit	2.3
Top 50 percentile (p50–p89)	33.3	Only bonds	1.1
Bottom 50 percentile (p1–p49)	60.8	Only bank loans	3.3
By geography		**By trade status**	
EU	79.6	No international trade	76.6

Note: Values expressed in %. Average 2015–18.

around it. To examine this, we assess next changes in firms' real and financial performance around the time of internationalization.

Table 6: Characteristics of Newly Financially Internationalized Corporations

	Corporations		
	Non-Internationalized	**Internationalized**	**Log differences in means P-values**
	(1)	(2)	(3)
Employment	29	118	0.00***
Fixed Assets*	1,885	7,971	0.00***
Sales*	6,031	26,994	0.00***
Log TFPR	3.41	3.46	0.04**
Investment Rate	0.14	0.18	0.00***
Leverage	0.48	0.55	0.00***

Notes: *, **, *** significant at 10, 5, and 1 percent. Sales and fixed assets are expressed in thousands of euros. Column 3 reports the p-values of the log difference of the means. Leverage is total debt over assets. Investment rate is measured as the change in fixed assets divided by lagged fixed assets. Year 2014.

4.2 Performance after Financial Internationalization

Financial internationalization is inherently non-random, with corporations self-selecting into this process. We treat this choice as a revealed preference and use firms' performance after the internationalization to infer the drivers of this process. More precisely, we assess changes in key real and financial indicators around internationalization and test whether a funding channel leads corporations to internationalize financially. We compare newly internationalized corporations with those that remain financially domestic in the years before and after internationalization and estimate the following regression

$$\Delta Y_{i,t} \quad = \quad \gamma_0 I_{i,t} + \sum_{s=1}^{5} \gamma_s X_{i,t0} + \mu_m + \varepsilon_{i,t}, \tag{1}$$

where $I_{i,t}$ is a internationalization dummy equal to one if the firm became financially internationalized in t, and zero otherwise. $\Delta Y_{i,t} = (\ln(Y_{i,t+1}) - \ln(Y_{i,t-1}))/2$ denotes the annualized change in the independent variable between the year before and after the financial internationalization. $X_{i,t0}$ is a set of controls capturing firm characteristics that may affect differential growth across firms. These include gross assets, log TFP, leverage (debt-to-asset ratio) and export and import shares, all measured prior to the internationalization—in 2014—to mitigate concerns of reverse causality. Because equation (1) is estimated in first differences, time-invariant industry characteristics are differenced out. To account for heterogeneous growth rate across sectors, we include five-digits sector fixed effects, μ_m. These fixed effects allow us to compare firms within narrowly defined industries.

Table 7 shows that, in the year after their financial internationalization, corporations expand their fixed assets by 2.9%, their employment by 1.2% and their capital-labor ratio by 1.8% relative to non-internationalized firms. Albeit modestly, their sales also increase by 0.6%. Interestingly, their financial internationalization does not seem to be trade-driven, as they reduce their export share by 3% and do not increase their export probability. Furthermore, their import probability increases only marginally, by 1%.

These results suggest that firms may become financially internationalized for reasons other than international trade. The increase in fixed assets and, in particular, in the capital–labor ratio points to a funding channel driving these decisions. Conceptually, these patterns imply deviations from the Modigliani and Miller (1958) benchmark—as their financial choices affect their real operations—and are consistent with the presence of financial frictions in France. To investigate this, we turn to the liability side of firms' balance sheets and examine how it changes following the internationalization.

Table 8 shows that corporations do not increase overall leverage but instead alter its composition. In particular, firms reduce their borrowing from the domestic banking sector by 5%, with a more pronounced decline in short-term credit (7.5%). This shift away from domestic bank financing is ac-

Table 7: Performance after Financial Internationalization: Real Variables

	Δ Fixed Assets	**Δ Employment**	**Δ Capital-Labor Ratio**	**Δ Sales**	**Δ Export Share**	**Export Dummy**	**Import Dummy**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$I_{i,t}$	0.029***	0.012***	0.018**	0.006**	-0.030***	0.003	0.010**
	(0.007)	(0.004)	(0.008)	(0.003)	(0.011)	(0.004)	(0.004)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5-digit sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.079	0.031	0.037	0.042	0.047	0.024	0.020
N	358,150	355,410	353,391	359,968	360,571	390,709	390,709

Notes: *, **, *** significant at 10, 5, and 1 percent. Dependent variable: $\Delta Y_{i,t} = ln(Y_{i,t+1}) - ln(Y_{i,t-1})/2$. Firm-level controls include log TFPR, log gross assets, log import share, log export share and log leverage in the initial year (2014). Columns 6 and 7 do not include the control for log import share and log export shares, as these firms are by definition non-importers and non-exporters.

companied by an 11% decline in interest coverage (computed as interest rate payments over earning before interest and assets).

Table 8: Performance after Financial Internationalization: Financial Variables

	Δ Leverage	**Δ Domestic Bank Leverage**	**Δ Domestic Bank ST Leverage**	**Δ Domestic Bank LT Leverage**	**Δ Interest Coverage**
	(1)	(2)	(3)	(4)	(5)
$I_{i,t}$	0.006	-0.051**	-0.075***	-0.031	-0.111***
	(0.005)	(0.022)	(0.023)	(0.027)	(0.036)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
5-digit sector FE	Yes	Yes	Yes	Yes	Yes
R^2	0.047	0.015	0.007	0.020	0.012
N	312,332	259,088	230,575	212,332	334,678

Notes: *, **, *** significant at 10, 5, and 1 percent. Dependent variable: $\Delta Y_{i,t} = ln(Y_{i,t+1}) - ln(Y_{i,t-1})/2$. Firm-level controls include TFP, gross assets, import and export share and leverage in the initial year (2014). Interest coverage is interest over earning before interest and taxes.

Foreign vs Domestic Control. An important aspect of firms' internationalization through equity funding is whether domestic owners retain control or cede it to foreign investors. Table B.12 in Appendix B shows that 61% of newly internationalized corporations transfer control to foreign owners (defined as a foreign ownership share above 50%), while only 39% remain domestically controlled. However, firms that retain control are larger and account for roughly two-thirds of employment, sales, and gross positions among newly internationalized firms. They are about three times larger in employment (108 versus 35 workers) and sales (26 versus 9 million euros) than firms that cede control. Interestingly, firms that transfer control to foreign owners are significantly more leveraged (64% versus 52%) and exhibit higher investment rates (although the latter difference is not statistically significant).

Tables B.13 and B.14 in Appendix B report the evolution of real and financial variables for both groups of firms and show broadly similar patterns following internationalization, albeit with some interesting differences. As above, financial internationalization appears unrelated to trade for both groups, as export shares decline by around 3%, and the probability of exporting increases only marginally (by 1%) for firms that become foreign-controlled.

Consistent with a funding channel driving firms to internationalize, firms that cede control—initially more leveraged—reduce their exposure to domestic bank borrowing more strongly. In particular, their domestic bank leverage declines by 12%, with reductions of 12.6% and 8.4% in short- and long-term loans, respectively, and they experience a 14% decline in interest coverage. Firms that retain domestic control—initially less leveraged—reduce their reliance on domestic banks to a lesser extent, primarily through lower short-term credit (4.8%), and accordingly exhibit a smaller decline in interest coverage (9%). Along these lines, firms that cede control to foreign investors increase their fixed capital by more (5.2% versus 1.7%) and also their capital–labor ratio (4.1%) and domestic sales (0.9%).

Taking stock

The patterns presented in this section indicate that the vast majority of firms that become financially internationalized are medium to large, non-public corporations that do not typically engage in international trade and internationalize almost exclusively by raising foreign funds in the form of non-public equity. Their high investment rate prior to the internationalization suggests that they might be in needs for external financing. The increase in their fixed assets and size after the internationalization confirms it. Contrary to the common belief that financial internatioanlization goes hand by hand with international trade, these firms do not typically engage in trade and do not increase their probability of export after the internationalization.

Instead, these firms experience significant changes in the liability side of their balance sheet pointing to a funding channel driving their internationalization. Following their internationalization, they reduce their credit with the domestic banking system and their interest rate payment. This indicates that firms substitute away from costly domestic bank credit towards equity from foreign investors and suggests an analog of the pecking order theory of capital structure in international finance.

We rationalize the funding channel of financial integration below with an application of the pecking order theory of capital structure (Donaldson 1961, Myers and Majluf 1984, among others). More details are presented in Appendix C.

A pecking order theory of capital structure in international finance. Assume a non-public firm that can undertake a fixed investment project $I > 0$ financed with external funds.[18] The firm can raise funds from local banks $D \geq 0$. There are financial imperfections in the domestic fianncial system such that the firm pays an interest rate r that depends on the debt level. As such, the cost of domestic bank debt is convex—i.e., $C'_D > 0$ and $C''_D \geq 0$—and given by $C_D(D) = (1+r_{(D)})D$. The firm can also raise equity $E \geq 0$, which—since the vast majority of corporations engaging in international finance are non-listed firms, and we do not observe firm changes in private equity with domestic residents—we assume it is entirely from foreign investors.[19] We model foreign equity issuance costs as comprising both a fixed and a proportional component. This structure captures the fixed costs of accessing foreign markets and variable costs such as dilution, underwriting fees, and adverse selection. It is consistent with structural models of financing frictions (e.g., Hennessy and Whited 2005, 2007) and with asymmetric information models in which equity issuance entails a discount (e.g., Myers and Majluf 1984). In particular, the firm needs to pay a fixed costs $\kappa > 0$ and a per–unit cost $\tau \geq 0$ for raising equity from foreign investors. Its foreign equity cost is $C_E(E) = \kappa \mathbf{1}\{E > 0\} + (1 + \tau)E$. The firm minimizes its total financing costs:

$$\min_{D,E \geq 0} \; C_D(D) + C_E(E) = (1 + r_{(D)})D + \kappa \mathbf{1}\{E > 0\} + (1 + \tau)E$$

$$\text{subject to } I = D + E.$$

If the firm only finances with debt and does not issue foreign equity, it sets debt equal to investment $D = I$. If the firm borrows domestically and issues foreign equity, it pays a fixed cost κ and chooses domestic borrowing D to minimize its financing costs. After determining its optimal bank debt level, foreign equity becomes $E = I - D$. The firm seeks foreign equity investors and becomes financially internationalized whenever the cost of only financing from local banks is higher than mix financing with local banks and foreign equity:

$$C^{\text{only D}} \geq C^{D\&E}. \tag{2}$$

Otherwise, the firm only finances with domestic bank debt.

To illustrate how domestic market imperfections and the firm's investment needs affect its choice of becoming financially internationalized, we let the convex cost of debt be quadratic and composed by a risk-free rate and a risk premium increasing with the firm's debt level, i.e., $r_{(D)} = r^f + \phi\frac{D}{2}$. After

[18] For simplicity, we assume that the firm does not have internal cash flows. Including cash flows would not affect the nature of the firm's problem. The firm would raise external funds F to finance its investment by the difference between the investment project and the cash flows (ω): $F \equiv I - \omega > 0$

[19] A valid question is why firms do not only raise equity from domestic investors. Given that our data is limited to cross-border operations, we leave this question for further research. We note that, in practice, domestic private equity could not have been available at the scope needed by the firm during the period under analysis or could have been more costly.

minimizing its financing costs, the optimal bank debt and foreign equity with mix financing become[20]

$$D^* = \frac{\tau - r^f}{\phi} \qquad \text{and} \qquad E^* = I - \frac{\tau - r^f}{\phi}. \tag{3}$$

Plugging $D = I$ when the firm only finances with local bank debt and equations in (3) for mix financing, the inequality in (2) shows that a firm becomes financially internationalized when

$$\frac{\phi}{2}\left(I - \frac{\tau - r^f}{\phi}\right)^2 \geq \kappa. \tag{4}$$

Equation (4) defines an investment threshold to become financially internationalize given by

$$\bar{I} = \frac{\tau - r^f}{\phi} + \sqrt{\frac{2\kappa}{\phi}}. \tag{5}$$

This application of the pecking order theory of capital structure to international finance can rationalize three main results.

(i) It is consistent with our finding that firms becoming financially internatioanlized and raising equity from foreign investors have higher investment rates prior to internationalization (and invest more in fixed assets upon it). More precisely, it is straightforward to see from equation (4) that the higher a firm's investment needs, the more likely the firm will raise equity from foreign investors:

$$\frac{\partial Pr(I > \bar{I})}{\partial I} > 0.$$

(ii) The result that, upon raising foreign equity, firms leverage down D to target D^* is in line with out finding that firms decrease their leverage from domestic banks after becoming financially internationalized.

(iii) Our finding that internationalizing firms have higher leverage prior to their internationalization and that their interest rate payment decline upon it is consistent with convex financial cost from bank borrowing. Our framework shows that the more convex is the cost debt function, the higher the probability of raising foreign equity:

$$\frac{\partial \bar{I}}{\partial \phi} < 0.$$

[20] We assume that foreign equity investors face higher frictions than domestic banks, e.g., higher informational asymmetries or being the residual claimants in case of default, and let $\tau > r_{(D)}$, $\forall D > 0$, such that equity is more expensive at the margin.

5 Application II: Biases in Cross-Border Allocations

In a frictionless world with complete markets, agents would allocate capital internationally so as to equalize risk-adjusted returns, independent of geography, institutions, or currency. A large literature, however, shows that factors—such as distance (Portes and Rey 2000, 2005), GDP (Martin and Rey 2004), institutional quality (Reinhart and Rogoff 2004 and Alfaro, Kalemli-Ozcan, and Volosovych 2008) and currency (Maggiori, Neiman, and Schreger 2020)—systematically shape cross-border financial allocations. The segmented pattern of financial integration presented in Section 3.2 suggests that these factors might affect firms' allocations heterogeneously. This section assesses this heterogeneity econometrically across the firm-size distribution.

Aggregate Analysis. To estimate the factors that affect aggregate France's cross-border operations, we regress France's fraction of gross financial flows allocated in country c at year t:

$$s_{F,c,t} = \beta^F \, Z_{c,t} + \phi_t + \varepsilon_{F,c,t}, \tag{6}$$

where $Z_{c,t}$ are the following variables: EU membership dummy, euro dummy, distance, GDP, institutional quality, common language dummy, common legal system dummy and common colonial history dummy.[21] We include the last three variables as the trade literature has shown that they exert a powerful influence on bilateral trade flows, with countries sharing such ties trading disproportionately more (Rose 2000; Frankel and Rose 2002; Disdier and Head 2008; Head and Mayer 2014). We standarized distance, GDP and institutional quality to be able to compare the size of the estimated coefficients. ϕ_t is year fixed effects controlling for common shocks that can affect allocations across time. We cluster the standard errors at the country level. A coefficient equal to zero, $\beta^F = 0$, implies France's allocation does not associate with these factors. $\beta^F > 0$ implies a higher fraction allocated in countries with Z's characteristics.

In our first exercise, we regress univariate regressions of equations (6)—namely, France's share in each country on each variable $Z_{c,t}$—to assess the relevance of each factor on the aggregate. Panel A in Table 9 shows that the euro, EU membership, GDP, distance, and institutional quality statistically significantly shape France's cross-border operations, with the first three being the most economically important factors. The estimated coefficient for the EU membership dummy in column 1 implies that

[21] We construct the institutional quality index following Alfaro, Kalemli-Ozcan, and Volosovych (2008), using annual country-level data from the Political Risk section of the International Country Risk Guide (ICRG), published by the PRS Group. The index is based on the sum of eleven political risk indicators—government stability, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality—and is rescaled to range from 0 to 10 for each country-year observation. Higher values indicate better institutional quality (lower risk).

a EU country has on average 2.1 percentage points higher share allocated than a non-EU country. Given that France's average allocation in a non-EU country is 0.3 percentage points, this coefficient implies a nine-times higher allocation in EU countries. Similarly, a euro-zone country exhibit a 2.3 percentage points higher allocation than a non-euro zone country, which is almost seven times higher than the average allocation on a non-euro zone country. Economic size also affects France's allocation as one standard deviation increase in a country's GDP increases France's allocation by 3 percentage points. Institutional quality and distance exhibit smaller coefficients with a one standard deviation increase in institutional quality and distance shaping France's allocation by 0.8 and -0.6 percentage points. Common language, common legal system and former colony do not seem to be associated with higher allocations.

Firm-level analysis. To assess relevance of these factors at the firm level, we regress the share of each group i's gross position with country c for instrument κ and type of stock j at t—$s_{i,c,\kappa,j,t}$—on these factors:

$$s_{i,c,\kappa,j,t} = \beta^{avg}\ Z_{c,t\ \forall i,c,\kappa,j,t} + \mu_i + \phi_t + \varepsilon_{i,c,\kappa,j,t}, \tag{7}$$

where μ_i are group fixed effects, which allow us to control for all groups unobserved time-invariant characteristics and to assess how factors $Z_{c,t}$ affect cross-border allocations within groups. This specification allows us to compare—within firms and year—whether firms' allocation vary systematically with the factors in $Z_{c,t}$. The coefficient β^{avg} captures the effect of these factors for the average firm in France.

Panel B in Table 9 confirm that euro, EU membership, GDP and institutional quality are main factors shaping the allocations of the average firm in France. Note that the estimated coefficients are smaller than in Panel A due to the inclusion of the group fixed effects that estimate the difference relative to the group's average value share (captured in group FE). Table B.15 in Appendix B reestimate equation (7) without including group fixed effects and shows that the coefficients are similar in size to those of Panel A.[22]

We next estimate whether this effect varies in the cross-section of firms by interacting factors $Z_{c,t}$ with the group rank dummies. In particular, we regress

$$\begin{aligned} s_{i,c,\kappa,j,t} &= \beta_1\ (Z_{c,t\ \forall i,c,\kappa,j,t} \times 1_{[top100,t]}) + \beta_2(Z_{c,t\ \forall i,c,\kappa,j,t} \times 1_{[p1,t]}) + \beta_3(Z_{c,t\ \forall i,c,\kappa,j,t} \times 1_{[p5,t]}) \\ &+ \beta_4(Z_{c,t\ \forall i,c,\kappa,j,t} \times 1_{[p10,t]}) + \beta_5(Z_{c,t\ \forall i,c,\kappa,j,t} \times 1_{[p90,t]}) + \mu_i + \phi_t + \varepsilon_{i,c,\kappa,j,t} \end{aligned} \tag{8}$$

where $1_{[top100,t]}$, $1_{[p1,t]}$, $1_{[p5,t]}$, $1_{[p10,t]}$ and $1_{[p90,t]}$ are group-rank dummies for Top 100 groups, top 1

[22] These coefficients could be reconcile by estimating WLS, weighting by the contribution of each instrument, type of stock and group on France's gross allocations.

Table 9: Biases in Allocations: Univariate Regressions

	Independent variable:							
	EU	**EUR**	**Distance**	**GDP**	**Common Language**	**Common colonial History**	**Common Legal System**	**Institutional Quality**
	Panel A. Aggregate Analysis. Dep. Var.: $s_{F,c,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
var	0.021***	0.023**	-0.006**	0.030***	0.005	0.001	0.004	0.008***
	(0.008)	(0.009)	(0.002)	(0.007)	(0.006)	(0.008)	(0.004)	(0.002)
Constant	0.003**	0.004**	0.011***	0.020***	0.007***	0.007***	0.006**	0.017***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.005)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.123	0.108	0.052	0.361	0.005	0.000	0.006	0.158
N	671	671	671	671	671	671	671	671
	Panel B. Firm-Level Analysis. Average Effect. Dep. Var.: $s_{i,c,j,\kappa,t}$							
var	0.003*	0.002**	-0.001	0.001***	0.001	0.001	0.000	0.002***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Group FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.692	0.692	0.692	0.692	0.692	0.692	0.692	0.692
N	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022
	Panel C. Firm-Level Analysis. Effect by Rank. Dep. Var.: $s_{i,c,j,\kappa,t}$							
Top 100 × var	0.000	0.000	-0.000	0.000***	0.000	0.000	-0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × var	0.001	0.000	-0.000	0.002***	0.001	0.003	-0.001	0.002***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.003)	(0.001)	(0.000)
Top p5 × var	0.003*	0.002**	-0.001	0.002***	0.003	0.001	0.001	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Top p10 × var	0.006***	0.004	-0.002**	0.003**	0.004	0.000	0.002	0.005***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.004)	(0.003)	(0.002)	(0.001)
Bottom 90 × var	0.011**	0.015**	-0.003	0.005**	0.002	0.004	-0.001	0.009***
	(0.006)	(0.007)	(0.007)	(0.002)	(0.007)	(0.005)	(0.005)	(0.003)
Group rank dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.694	0.694	0.694	0.694	0.694	0.694	0.694	0.693
N	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022	2,651,022

Notes: *, **, *** significant at 10, 5, and 1 percent. Standard errors clustered at the country level.

percentile (p99 to p99.74), top 5 percentile (p95 to p98), top 10 percentile (p90 to p94) and bottom 90 percentile (p1 to p89).[23]

Panel C shows a large assymmetry between the allocation of the largest groups and the rest, and that the average effect across firms reported in Panel B is driven by the smaller firms. Allocations of granular groups are uncorrelated with EU membership, euro denomination, distance, GDP, common

[23] As noted above, bottom-90th-percentile groups typically hold positions in only one country and rely on a single instrument. We therefore aggregate them into a single category, as there is no meaningful cross-country or cross-instrument variation to exploit.

language, common colonial history or common legal system. As such, the largest group allocate their gross financial operations globally without exhibiting systematic biases or gravity forces. Neither informational, financial, nor other frictions appear to meaningfully affect their allocation decisions, as they seem to be effectively able to overcome such constraints. By contrast, the allocations of firms in the bottom groups exhibit systematic distortions. Column 1 shows that their portfolios are tilted toward EU countries, reflecting regional proximity and institutional integration. Column 2 indicates that they allocate larger shares to euro-denominated operations, consistent with limited to hedging and financial frictions. Columns 3 and 4 reveal traditional gravity effects, as distance discourages and market size attracts cross-border positions. Interestingly, these biases increase monotonically as firm size declines, and for firms in the bottom 90th percentile they are an order of magnitude larger than for those in 95th to 98th percentiles.

Table 10 reports the results of multivariate regressions including all factors simultaneously, where we group all bottom 99 percentile together for expositional purposes. All specifications confirm the segmentation pattern between granular and bottom groups: only the allocations of the latter are meaningfully affected by these distortions. Column 1 shows that, for bottom groups, only the euro dummy and GDP significantly shape cross-border allocations. The estimated coefficient on euro denomination is economically meaningful, indicating that bottom-99th firms allocate, on average, 0.6 percentage points more to euro-denominated positions. The coefficient on GDP is smaller in magnitude, implying that a 1% higher GDP per capita is associated with a 0.002-percentage-point higher share allocated to that country.

The decomposition between investing and funding activities in Columns 2 and 3 is particularly informative. Gravity variables (distance and GDP) a play central role in shaping the foreign asset positions of bottom groups. Combined with the earlier results showing that the few firms in the bottom 99th that have foreign investment predominantly use equity investment, this evidence suggests that foreign equity investment by smaller firms are disproportionately oriented toward larger and geographically closer countries. By contrast, currency and EU membership biases—although the EU dummy is only marginally statistically significant—are the main factors affecting cross-border funding. In particular, the estimated coefficients imply that bottom groups seem to issue 1.5 percentage points higher funds from EU countries and in euros.

Columns 4 and 5 decompose between corporations and financial groups and show that the currency bias seems to be a key factor shaping the allocations of both types of groups. The currency bias is smaller for financial groups, consistent with these agents being generally more sophisticated and better able to overcome financial frictions. Financial groups also report to allocate higher shares in EU countries.[24]

[24]The coefficient for GDP is statistically significant for corporations, although its size is rather small.

Table 10: Biases in Allocations: Multivariate Regressions

	All firms	**Type of Stock**		**Sector**	
		Investing	**Funding**	**Corporations**	**Financial**
	(1)	(2)	(3)	(4)	(5)
Top 100 × EU	0.000	0.000	0.000*	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × EU	0.003**	0.002*	0.003	0.004*	0.001***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.000)
Bottom p99 × EU	0.009	0.001	0.017*	0.010	0.006*
	(0.006)	(0.002)	(0.009)	(0.008)	(0.003)
Top 100 × EUR	0.000*	-0.000	0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × EUR	0.001	0.001	0.002***	0.000	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Bottom p99 × EUR	0.007**	0.001	0.017***	0.008**	0.003***
	(0.003)	(0.002)	(0.003)	(0.004)	(0.001)
Top 100 × distance	-0.000	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × distance	0.000	-0.000	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)
Bottom p99 × distance	0.001	-0.002***	0.005	0.002	0.000
	(0.002)	(0.001)	(0.003)	(0.002)	(0.001)
Top 100 × GDP	0.000	0.000***	0.000	0.001***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × GDP	0.003***	0.003***	0.002***	0.003***	0.001***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Bottom p99 × GDP	0.006***	0.005***	0.007***	0.007***	0.002***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Top 100 × Institutional Quality	0.000*	0.000	0.000	0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Top p1 × Institutional Quality	0.001**	0.001***	0.001*	0.001*	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bottom p99 × Institutional Quality	0.003*	0.001**	0.005**	0.004**	0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Commonalities control	Yes	Yes	Yes	Yes	Yes
Common colonial history	Yes	Yes	Yes	Yes	Yes
Common legal system	Yes	Yes	Yes	Yes	Yes
Group rank dummy	Yes	Yes	Yes	Yes	Yes
Group FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
R^2	0.693	0.863	0.657	0.660	0.711
N	2,651,022	1,391,801	1,258,724	1,307,451	1,343,571

Notes: *, **, *** significant at 10, 5, and 1 percent. Std errors clustered at the country level.

Comparison with world allocation. In Appendix D, we assess how France's financial integration compares with the world allocation. Taking the world allocation as a benchmark, we show that the top 100 groups allocate their cross-border operations across countries in a manner closely aligned with the world

benchmark, with a point estimate of 0.83. This similarity declines sharply down the size distribution: bottom 95th firms display allocations that are roughly half as aligned as those of granular firms, with a point estimate of 0.43. This difference is present in both funding and investing activities and sharper for corporations.

Taken together, these findings reinforce our earlier findings: France's firm level financial integration is highly segmented, with largest firms allocating internationally without any gravity forces or currency and institutional biases and in line with world allocations, but the vast majority of firms remain geographically concentrated and subject to biases.

6 Application III: Segmentation and Exchange Rates

The previous sections showed that international financial integration is segmented across firms and relies heavily on the operations of granular groups. Capital flows being concentrated in a small number of groups could imply that idiosyncratic shocks might not average out and affect aggregate dynamics.[25]

We turn to assess whether the segmented financial internationalization pattern documented above affects a key price in international finance: the exchange rate. More precisely, we examine whether idiosyncratic shocks induce changes in cross-border financial allocations and, through this channel, affect the exchange rate of the recipient country. We further examine the validity of the mechanism by assessing its heterogeneous effect between granular agents and rest, and across countries with different exposure to idiosyncratic shocks. Our analysis focuses on banks, for which we have detailed and high-frequency information on their operations, allowing us to estimate their idiosyncratic shocks.[26]

We proceed as follows. We first discuss how we isolate banks' idiosyncratic shocks using matched bank-firm data at monthly frequency for domestic loans from the French National Credit Register. We next present our empirical strategy to assess whether banks adjust their cross-border financial flows in response to these shocks and, if so, whether these flows affect the bilateral exchange rate between the euro and the destination country. We discuss then how this effect might be heterogeneous across banks and countries' exposure to bank-specific shocks.[27] Since these shocks originate from the asset side of banks' balance sheets, we focus on assessing their impact on cross-border financial investments—that

[25] There is a large literature showing the impact of granular firms on aggregates. See for example, on macro: Gabaix (2011) and Carvalho and Gabaix (2013), on trade: di Giovanni, Levchenko, and Mejean (2014) di Giovanni, Levchenko, and Mejean (2018), on asset prices: Herskovic (2018), Gabaix and Koijen (2024), Gao (2022), among others.

[26] Unfortunately, comparable high-frequency (monthly) data are not available for non-financial firms, as balance sheet information is typically reported at an annual frequency. This limitation prevents us from estimating their idiosyncratic shocks and, consequently, from assessing their impact on exchange rate dynamics, which is more accurately captured at higher frequencies than annual data allow.

[27] We exclude euro-zone countries as well as countries whose currencies are pegged or anchored to the euro and dollar. See Table B.16 in Appendix B for further details.

is, on banks' foreign asset flows.[28] Lastly, we present the results.

(i) Bank-idiosyncratic supply shocks. We proxy banks' idiosyncratic supply shocks following the methodology of Amiti and Weinstein (2018), which identifies idiosyncratic movements in loan supply at the bank level. This approach provides a measure of bank-specific asset supply shocks in France that we then use it to assess their implications for banks' cross-border flows.

We follow Amiti and Weinstein (2018) and exploit firms' relationships with multiple banks to measure bank-specific changes of the loan supply that cannot be explained by common shocks affecting all banks or changes in firms' demand for loans. Specifically, we estimate the following WLS regression

$$\Delta L_{ibm} = \mu_{i,m} + \lambda_{bm} + \varepsilon_{ibm}, \tag{9}$$

where $\Delta L_{ibt} = (L_{ibt} - L_{ibt-1})/L_{ibt-1}$ denotes loan growth from bank b to firm i at month m. The term $\mu_{i,m}$ captures firm-month fixed effects, which absorb changes in firm-specific demand for credit each month that could arise from firm-level productivity shocks, changes in factors cost, changes in investment demand, etc. The term λ_{bm} denotes bank-month fixed effects, which captures changes in bank-idiosyncratic supply of credit each month. These shocks are demeaned by bank-month averages, which allows removing any aggregate common trend across banks. Following Amiti and Weinstein (2018)—showing that using firm demand shocks common across all of a firm's lenders and that the WLS estimator of equation (9) absorbs any aggregate loan growth common across banks—this specification allows us to identify bank-idiosyncratic supply shocks—denoted by $\hat{\lambda}_{bm}$—for each month between 2013m1 and 2018m12.

(ii) Impact of bank-idiosyncratic shocks on cross-border allocations and the exchange rate. To assess whether banks' idiosyncratic shocks trigger cross-border financial flows that affect bilateral exchange rates, we use these shocks as instruments to estimate the banks' fitted cross-border financial flows to each destination country at the monthly frequency. We then aggregate the fitted flows at the country level and examine whether the resulting predicted total financial flows are associated with exchange rate movements in the corresponding destination country. Accordingly, our empirical strategy consists of two steps, which we discuss in detail below. In the first step, we estimate the fitted cross-border flows to each destination country. In the second step, we quantify the effect of these cross-border flows on bilateral exchange rate changes.

[28] Ideally, one would also estimate banks' idiosyncratic shocks arising from the liability side of their balance sheets (e.g., deposits). Unfortunately, detailed bank–client data at high frequency are not available.

-Estimation of fitted cross-border flows. To obtain the fitted banks' cross-border financial flows to each destination country at the monthly frequency, we first need to estimate each country's sensitivity of financial flows to bank-specific idiosyncratic shocks. Specifically, we estimate, for each destination country, the semi-elasticity of banks' financial flows to idiosyncratic supply shocks of banks reporting financial flows in that country.[29] Since our data on international financial operations is only reported at the yearly frequency, we estimate these semi-elasticities at the year level. In particular, we estimate

$$\ln \text{flow}_{by}^{c} = \alpha^{c} + \beta^{c} \left[\overline{\lambda}_{by} \times 1_{\{\text{flow}_{bcy} \neq 0\}}\right] + \varepsilon_{by}^{c} \qquad \forall c, \tag{10}$$

$\ln \text{flow}_{by}^{c}$ is the log of bank b's financial flows to country c in year y. Flows are computed as the difference in stocks of the bank's consolidated financial asset position in country c between year $t+1$ and t, and logs are normalized to avoid losing negative values. We show below that our results remain valid when estimating cross-border flows in levels. We employ banks' consolidated positions as the sum of all their asset positions reported in direct investment, portfolio investment and other investment. $\overline{\lambda}_{by}$ denotes the bank's annual idiosyncratic shock, defined as the sum of its monthly idiosyncratic shocks—estimated in equation (9)—over the course of the year: $\overline{\lambda}_{by} = \sum_{m=1}^{12} \hat{\lambda}_{bm}$. $1_{\{\text{flow}_{byc} \neq 0\}}$ is an indicator if bank b has a non-zero flow with country c in that year. We estimate equation (10) separately for each destination country, such that we obtain a coefficient β^{c} for each destination country. The coefficients α^{c} are country's individual slopes that absorb any country, time-invariant characteristics that would make banks invest heterogeneously across countries. The coefficients β^{c} are each country's semi-elasticity of financial flows to bank-specific idiosyncratic shocks and are our parameters of interest. This exercise uses the β^{c} coefficients as revealed-preference measures to construct fitted cross-border flows at the monthly frequency, rather than to develop a theory for them.

The identification assumption of our approach is that there is enough variation in β^{c} across countries to estimate cross-country differences in cross-border financial flows and that this variation is not correlated with other factors that would make bank-idiosyncratic supply shocks to have a different sensitivity in cross-country flows. This latter is guaranteed as our bank-idiosyncratic shocks are identified from bank-specific supply shocks to domestic loans in France and are orthogonal to any aggregate lending shocks in France as well as firm-specific demand shocks (exogeneity assumption). Note that average differences across countries are not a threat to the identification as these are captured by the constant terms α^{c}. Our strategy also precludes from reverse causality, as bank-idiosyncratic shocks are identified at monthly frequency from firm-bank loan relationships in France and banks operate in multiple

[29] A similar two-stage approach has been employed to estimate the state-dependent impact of fiscal policy. See for example Cloyne, Jorda, and Taylor (2023).

destination countries.[30]

Having estimated each country semi-elasticity to bank-idiosyncratic shocks, we then use them to construct the monthly fitted financial flows of each bank to each country: $\widehat{\ln \text{flow}}_{bcm}$. That is, under the assumption that country's c semi-elasticity of financial flows to banks' idiosyncratic shocks does not differ meaningfully between monthly and yearly frequencies, we can obtain each bank's predicted flows in country c at monthly frequency by multiplying the monthly bank-idiosyncratic shock (estimated in equation (9)) by country's c semi-elasticity of financial flows to banks' idiosyncratic shocks (estimated in 10), for all banks investing in country c:

$$\widehat{\ln \text{flow}}_{bcm} = \hat{\beta}^c \times [\hat{\lambda}_{bm} \times 1_{\{\text{flow}_{bcm} \neq 0\}}], \tag{11}$$

where $1_{\{\text{flow}_{bcm} \neq 0\}}$ is an indicator if the bank has non-zero financial flows in c at month m. We then aggregate these fitted flows at the country-month level by adding the financial asset flows of all banks investing in country c in each month:

$$\widehat{\ln \text{flow}}_{cm} = \sum_{b \in c} \widehat{\ln \text{flow}}_{bcm}. \tag{12}$$

Equation (12) provides the fitted value of banks' financial flows to country c that arise from their idiosyncratic supply shocks.

-Impact of banks' flows on the bilateral on exchange rate. We next assess whether fitted cross-border financial flows of banks—triggered by their idiosyncratic supply shocks—affect the exchange rate of the destination country. With this end, we regress, at a monthly frequency, the bilateral exchange rate change of each destination country on the fitted financial flows to that country:

$$\Delta ER_{cm} = \gamma_0 + \gamma_1 \widehat{\ln \text{flow}}_{cm} + \nu_m + \varepsilon_{cm}, \tag{13}$$

where ΔER_{cm} is the monthly exchange rate change in units of local currency per euro. ν_m are time-fixed effects at monthly frequency that capture any global shocks that can affect bilateral exchange rates simultaneously. The coefficient of interest is γ_1, which captures whether banks' cross-border financial flows, triggered by their idiosyncratic shocks, associate with exchange rate changes.

[30] Table B.17 in Section Appendix B reports the median number of destination countries in which banks hold asset positions. Across the entire bank size distribution, banks reporting both domestic credit and cross-border financial activities operate in multiple jurisdictions. These banks rank among the largest in our sample and account for 60% of the financial groups covered in the IIP data. The remaining 40% of financial groups—those with foreign asset positions but not matched to the credit registry, as they do not extend loans to firms in France—exhibit a similar pattern of segmentation to that documented above. Among this latter group, the top 100 financial groups report asset positions in a median of 64 destination countries, whereas the bottom 50 report positions in only two.

-Heterogeneous effect across banks and country's exposure to banks shocks. As shown above, international financial operations are concentrated among a small group of granular agents. This concentration suggests that the transmission of financial flows to the exchange rate may be primarily driven by these agents. To test for such heterogeneity, we reconstruct each country's financial flows from equation (12) distinguishing between flows originating from granular banks—those in the top 1st percentile of the size distribution—and those from the remaining banks:

$$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} = \sum_{g \in c} \widehat{\ln \text{flow}}_{gcm} \qquad \text{and} \qquad \widehat{\ln \text{flow}}_{cm}^{\text{rest}} = \sum_{r \in c} \widehat{\ln \text{flow}}_{rcm} \tag{14}$$

where g and r denote granular and rest banks, and $\widehat{\ln \text{flow}}_{cm}^{\text{granular}}$ and $\widehat{\ln \text{flow}}_{cm}^{\text{rest}}$ are the sum of financial flows of granular banks and rest of banks to each country, respectively. We then re-estimate equation (13) separately for both groups to assess whether the exchange rate sensitivity differs between granular and non-granular banks:

$$\Delta ER_{cm} = \gamma_0^g + \gamma_1^g \, [\widehat{\ln \text{flow}}_{cm}^{\text{granular}}] + \nu_m + \varepsilon_{cm}^g, \tag{15}$$

$$\Delta ER_{cm} = \gamma_0^r + \gamma_1^r \, [\widehat{\ln \text{flow}}_{cm}^{\text{rest}}] + \nu_m + \varepsilon_{cm}^r, \tag{16}$$

Importantly, the effect on the exchange rate is expected to be stronger in countries where inflows from granular banks account for a larger share of the currency demand. To proxy for this, we use national account data to compute each country's net financial flows—defined as the annual difference between inwards and outwards financial flows—and then calculate the share of granular banks' financial flows in total net flows, i.e., $share_{cy} = \frac{\text{flow}_{cy}^b}{\text{net flow}_{cy}}$. Based on these shares, we construct quantiles according to the share of granular banks' flows and re-estimate equation (15) by interacting their flows with these quantile indicators. This allows us to assess whether the sensitivity of exchange rate movements increases with the relative importance of granular banks' financial flows in the destination country. We estimate

$$\Delta ER_{cm} = \tilde{\gamma}_0 + \sum_{q=1}^{4} \tilde{\gamma}_1^q \, [\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^q] + \nu_m + \varepsilon_{cm}^q, \tag{17}$$

where Q_{cy-1}^q are dummy variables for each quantile, which are estimated on previous year's granular banks shares on the country's net financial flows to mitigate endogeneity concerns. The coefficients of interest are γ_1^q and are expected to be higher for larger quantiles, where granular banks' financial flows account for a larger share in the country's financial flows. Table B.20 in Appendix B presents summary

statistics by quantiles of banks' shares in countries' net flows.

(iii) Results. We first introduce main statistics of our estimated bank-idiosyncratic shocks, countries' semi-elasticities of financial flows and fitted bank flows. We then discuss the results of the fitted financial flows on the exchange rate of the destination country.

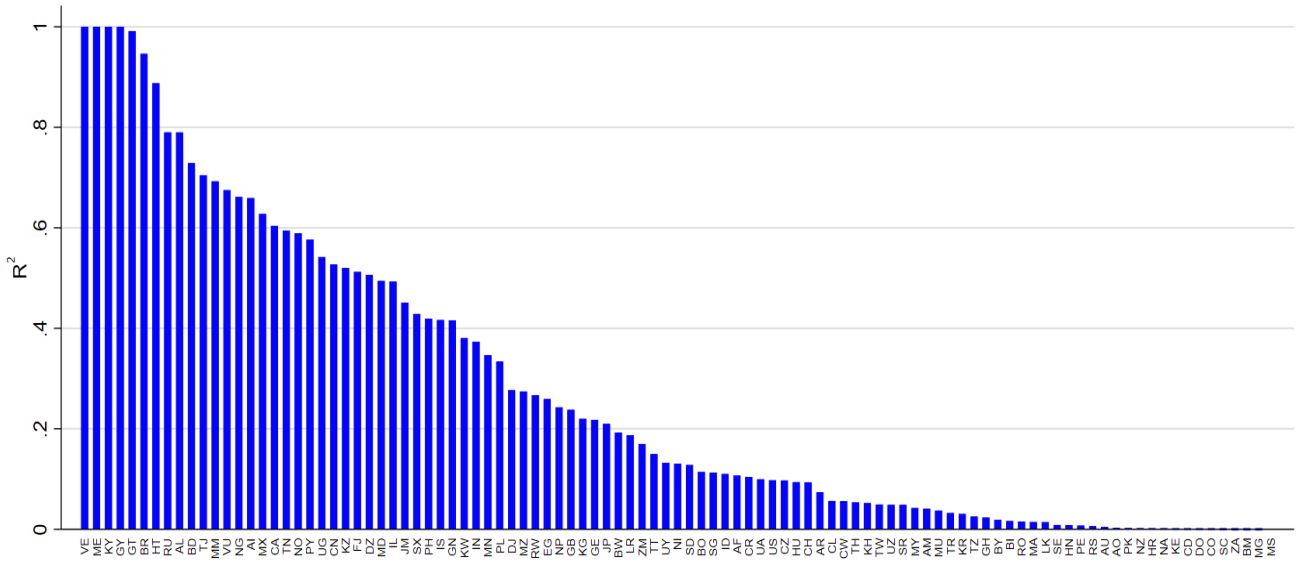
-Bank-idiosyncratic shocks, semi-elasticities and fitted capital flows. Panel A of Table B.18 in Appendix B reports main summary statistics of the estimated bank-idiosyncratic shocks, $\hat{\lambda}_{bm}$, defined in equation (9). We estimate monthly shocks for 354 deposit institutions between January 2013 and December 2018, of which approximately 70% report cross-border financial operations. The estimated shocks are demeaned by the average bank to remove common components, exhibit a standard deviation of 12%, and take both positive and negative values, indicating heterogeneity in bank-specific idiosyncratic shocks and the presence of both favorable and adverse shocks throughout the period.

The estimated country-specific semi-elasticities of financial flows with respect to bank idiosyncratic shocks, $\hat{\beta}^c$, obtained from equation (10), are presented in Figure B.8 in Section Appendix B. While there is no theoretical framework predicting whether these semi-elasticities should be positive, negative, or zero, the estimates $\hat{\beta}^c$ span both positive and negative values across countries. This pattern indicates that some economies experience inflows while others experience retrenchments following favorable bank-specific shocks in France. From an econometric standpoint, the substantial cross-country heterogeneity in these semi-elasticities enables us to compute fitted financial flow values for each destination country. Panel B of Table B.18 in Section Appendix B presents additional descriptive statistics for these estimated semi-elasticities.

Having estimated banks' idiosyncratic shocks and the country-specific semi-elasticities of financial flows, we proceed to construct fitted financial flows to each destination country following equation (12). To asses the relevance assumption of our instrument, we assess the explanatory power of our fitted bank flows for aggregate capital inflows using national accounts data. Specifically, for each country, we estimate a univariate regression of aggregate financial inflows reported in national accounts on the corresponding fitted bank financial flows from our analysis. Although there is no benchmark for the expected magnitude of the R^2—since aggregate capital inflows also include transactions by corporations, other financial institutions, and the public sector—a high R^2 indicates that our measure captures a meaningful share of the variation in cross-border financial inflows of each country. Figure 2 plots the estimated R^2 values by country, showing that they are sizable for many economies, exceeding 20% in nearly half of the sample.

-Impact of bank-idiosyncratic shocks on the exchange rate. Table 11 reports the results of regression

Figure 2: R^2 of Univariate Regressions of Financial Flows on Fitted Bank Flows by Country



(13). Column 1 shows that, although only marginally significant at the ten percent level, the estimated coefficient on the exchange rate change is negative, implying that a 1 percent increase in fitted bank flows to a country associates with a 2.6 percent appreciation of the domestic currency. Columns 2 and 3 indicate that this appreciation is driven by inflows from granular banks: the estimated coefficient γ_1^g from equation (15) is statistically significant, whereas γ_1^r from equation (16) is small and statistically indistinguishable from zero. The coefficient for granular banks implies that a 1 percent increase in their fitted capital flows is associated with a 4.6 percent appreciation of the local currency. Column 4 further decomposes granular banks' fitted financial flows by quantiles, following equation (17), where higher quantiles correspond to countries in which banks account for a larger share of total net flows. Only the coefficient for the top quantile is statistically significant and economically meaningful, indicating that in countries where banks account for a larger share of currency demand, a 1 percent increase in fitted bank flows is associated with a 9.3 percent monthly appreciation. In Table B.19 in Appendix B, we provide a series of additional tests and show that our results are robust to: (1) excluding tax haven countries, (2) countries having as legal tender main currencies such as USA, Japan, Switzerland and the UK (note that we had already excluded countries pegged to the USD), and (3) estimating the regressions in levels (rather than logs).

Overall, the results indicate that idiosyncratic shocks to French banks propagate internationally through their cross-border investing activities, influencing exchange rate dynamics in destination countries. The effects are economically meaningful yet highly concentrated: while the aggregate sensitivity of exchange rates to predicted bank flows is modest, it becomes substantially stronger for flows originating

Table 11: Impact of Banks' Idiosyncratic Shocks on the Exchange Rate

	Dependent variable: ΔER_{cm} (% change)			
	(1)	(2)	(3)	(4)
$\widehat{\ln \text{flow}}_{cm}$	-2.6028*			
	(1.5562)			
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}}$		-4.5960**		
		(2.1808)		
$\widehat{\ln \text{flow}}_{cm}^{\text{rest}}$			-1.3530	
			(2.2278)	
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q^1_{cy-1}$				-2.8063
				(6.3795)
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q^2_{cy-1}$				0.8531
				(4.5308)
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q^3_{cy-1}$				-5.5580
				(5.5239)
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q^4_{cy-1}$				-9.3076**
				(4.5600)
Month FE	Yes	Yes	Yes	Yes
R^2	0.3513	0.3525	0.3456	0.3479
Observations	7,833	7,809	7,033	6,192

Notes: Robust standard errors in parentheses. *, **, *** denote significance at 10, 5, and 1 percent, respectively. All regressions include a constant term.

from granular banks and for countries where these banks account for a large share of total financial inflows. This evidence points to a granular transmission mechanism in international finance, whereby shocks to a small set of globally active banks shape cross-border capital movements and bilateral exchange rates, and is consistent with the theoretical literature emphasizing the importance of global financial intermediaries in segmented capital markets (Gabaix and Maggiori 2015,Gourinchas, Ray, and Vayanos 2025, Barbiero, Bräuning, Joaquim, and Stein 2024, among others).

7 Conclusion

This paper advances the literature by assembling a novel, administrative, micro-level dataset on the quasi-universe of France's cross-border financial operations between 2014 and 2018. This unique coverage allows us to provide the first evidence on the micro-structure of cross-border financial operations, tracing how agent-level positions aggregate into national outcomes.

Our analysis shows that international financial integration driven by a small fraction of firms accounting for less than 1% of firms in the economy (Fact 1) and is highly segmented across firms (Fact

2). A small set of firms—particularly those in the top 1st percentile—account for the majority of France's international financial flows, operate across many countries and currencies, using a large set of instruments and invest and raise funds in foreign market. Furthermore, they allocate globally without systematic biases—namely without any sign of currency, EU, gravity, legal system, colonial history or language biases—, consistent with a benchmark of frictionless capital markets. By contrast, the vast majority of firms only internationalize through foreign funding, remain regionally concentrated, holding positions overwhelmingly within the EU and in euros. These firms display strong currency bias and are disproportionately affected by institutional-related frictions. Our counterfactual exercise further demonstrates that France's aggregate internationalization relies critically on the internationalization of granular firms. Our findings also provide novel evidence that the concentration of cross-border investment activities in a small subset of agents has macroeconomic implications, as idiosyncratic shocks to granular banks trigger significant adjustments in their cross-border financial flows, with measurable implications for exchange rate dynamics.

Taken together, these findings have four broad implications. First, they challenge the representative agent view of international capital flows: aggregate measures of integration conceal deep heterogeneity across firms, with internationalization driven by a narrow set of actors. Second, they suggest that capturing the dynamics of international financial integration requires models with a fat-tailed firm-size distribution and heterogeneous internationalization patterns across firms. The strong selection into foreign financial operations points to large fixed costs of engaging in these activities. Higher fixed costs for foreign investment than for foreign funding may explain why investment activities are concentrated in a small number of agents. Third, our result show that, for most firms, financial internationalization does not appear to be trade-driven; instead, it resembles a pecking-order pattern of capital structure. This seek for foreign funding is striking in a capital-abundant economy such as France, which ranks in the 90th percentile of the global capital-labor distribution. Finally, our findings call for international macro-finance models that explicitly incorporate firm heterogeneity, as macro-financial dynamics—such as external adjustment, valuation effects, and the global transmission of financial shocks—may be shaped disproportionately by the behavior of a handful of large firms, rather than by the average firm in the economy. Future research should further investigate the implications for global capital allocation, financial stability, and macroeconomic adjustment.

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Appendix A Data Description

In this appendix, we describe in detail the steps to produce our dataset. We construct our dataset by collecting, harmonizing and merging 12 different micro-level datasets which are collected for the purpose of constructing France's official balance-of-payments (BoP) and International Investment position (IIP) statistics. These data are compiled by the Banque de France, the institution legally responsible for producing external sector statistics according to the guidelines of Balance of Payments and International Investment Position Manual (BMP6), also in collaboration with other national agencies such the French National Institute (INSEE), the French Treasury and the French Customs Office.

Direct investment (DI) data covers transactions and positions between direct investors and direct investment enterprises, where a direct investor owns 10 percent or more of the ordinary shares or voting power of the direct investment enterprise. It also includes transactions between mutually "invested enterprises", that is, when both enterprises are owned by a common parent company (even if there is no direct ownership link between them). Direct investment transactions include equity capital, reinvested earnings, and debt relationships (inter-company lending). We observe stocks of each of the three concepts for each parent $\times$ affiliate pair, including information on the country and currency of the transaction. The data contains a unique firm French identifier SIREN for the firm residing in France, the names of the domestic and foreign firms, as well as the country of residence and name of the headquarters. It is of annual frequency.

The data are directly collected by Banque de France. Transactions that exceed 15 million euros are to be reported directly by law requirement. For outward positions, smaller operations are collected by an annual survey of entreprises. The equity capital positions of inward DI are based primarily on the identification of non-residents' holdings of more than 10% of the equity capital in any resident enterprise. For non-financial firms, the main source is the Banque de France's FIBEN survey, complemented with the ESANE annual business statistics dataset from INSEE. For banks, data comes from the French Macro-Prudential authority (ACPR), and for insurers, it is collected by the Banque de France's Monetary and Financial Statistics Directorate. Most of Equity Capital is valuated at book values, except in cases where the investee is a listed in a stock exchange, in which case market values are used (official statistics are published at *mixed value*, including market values only when available). In practice, the vast majority of DI positions involve unlisted firms (over 99,8 %)

Portfolio investment (PI) data covers transactions in negotiable securities between French residents and non-residents, including purchases of new issues, trading and redemptions (but excluding temporary transactions with no change in ownership, such as repurchase agreements (repo), which are recorded

under "other investments" because they are akin to short-term loans among banks.

The PI dataset is a security-by-security dataset. Each security is identified by a unique International Securities Identification Number (ISIN), and in a few cases by a CUSIP number (Committee on Uniform Securities Identification Procedures). For each security and date, we observe the country and sector of issuance and the country and sector where it is held (when the same security is held in different countries and/or by agents in different sectors, we observe stocks and flows for each country/sector pair at each date). Importantly, the data also contains the LEI number of the security's issuer.

For resident banks, we can observe all of their security holdings at the individual level. The main source of data for securities' holdings is a monthly collection of statistics on individual securities reported at the monthly level by French custodians, labeled PROTIDE. Custodians report their own portfolio investment positions in each security, along with those of their resident and non-resident customers. The custodian data are complemented with three other sources: 1) data on investment funds and collected by the Banque de France, 2) data on security issuance by residents also collected by Banque de France, and 3) direct reporting to the Banque de France and the ACPR by monetary and financial institutions and investment firms (which also serve to compute the Other Investments item, as mentioned below). PROTIDE is used to populate the French portion of the Security Holdings Database (SHSDB), which gathers data on security holdings for euro area economies and it is compiled by the European Central Bank using inputs from all national central banks. However, an important advantage of our data over SHS is that we can observe individual holdings by banks, whereas SHSDB reports holdings at the institutional sector level.

Table 1: Portfolio Assets by Institutional Sector (2014)

Sector	Percentage (%)
Deposit-taking corporations except central banks	24.80
Government	2.19
Households and non-profit organisations	2.05
Insurance corporations	36.21
Money market funds (MMF)	4.91
Non-MMF Investment funds	23.93
Non-financial corporations	1.91
Other financial intermediaries, except insurance corporations and pension funds	2.93
Other (inc pension funds)	1.07

Other Investments (OI) data include data for banks, investment firms, and non-financial firms. For all resident banks and investment firms we observe the value of assets and liabilities with non-residents, broken-down by balance-of-payments' concept, and including information on the partner country and currency of the transaction. These concepts are loans and deposits, including repurchasing

agreements (repo), and also "Other accounts payable/receivable". The data also includes information on the institutional sector of the counterpart and on the duration of the claims, discriminating between short-term (< one year) and long-term (> one year). These data are collected directly from the Banque de France and it is comprehensive.

For firms non-financial firms, we rely on information from two surveys conducted by the Banque de France. The ECO survey provides information on the value of the stock of trade credit between non-affiliated firms at a quarterly level, with information on the country of the foreign end of the transaction as well as the currency in which the debt is denominated. The EFI survey provides information on the value of the stock of all financial debt (other than trade credit) between non-affiliated firms at a quarterly level, also with information on the country of the foreign end of the transaction and currency. These data include deposits in foreign countries by French residents.

Table 2: France's International Investment Position

	2014	2015	2016	2017	2018
1. Direct Investment	**489.4**	**533.5**	**559.7**	**517.9**	**564.4**
1.1. French Direct Investment Abroad	**1,066.0**	**1,164.9**	**1,218.9**	**1,201.0**	**1,271.5**
1.1.1. Equity Capital	1,012.7	1,079.8	1,111.9	1,097.2	1,208.8
1.1.2. Inter-company Lending	380.6	419.4	445.7	439.9	410.6
1.2. Foreign Direct Investment in France	**576.6**	**631.4**	**659.2**	**683.2**	**707.2**
1.2.1. Equity Capital	528.8	576.1	604.0	625.3	646.1
1.2.2. Intercompany Lending	375.2	389.5	393.9	393.9	409.0
2. Portfolio Investment	**-785.3**	**-743.7**	**-736.5**	**-763.9**	**-796.9**
2.1. Foreign Securities	**2,267.4**	**2,341.8**	**2,392.8**	**2,410.4**	**2,330.0**
2.1.1. Equity Securities and Investment Fund	634.8	687.1	715.1	795.7	686.8
2.1.2. Long-Term Debt Securities	1,435.4	1,472.4	1,496.0	1,419.2	1,435.6
2.1.3. Short-Term Debt Securities	197.2	182.3	181.7	195.5	207.6
2.2. Domestic Securities	**3,052.7**	**3,085.3**	**3,129.3**	**3,174.3**	**3,126.6**
2.2.1. Equity Securities and Investment Fund	743.1	783.9	823.3	914.1	804.1
2.2.2. Long-Term Debt Securities	2,067.4	2,082.8	2,087.5	2,037.4	2,073.8
2.2.3. Short-Term Debt Securities	242.2	218.7	218.5	222.7	248.7
3. Financial Derivatives	**-59.6**	**-35.2**	**-46.5**	**-69.2**	**-72.5**
4. Other Investment	**-98.3**	**-165.7**	**-206.6**	**-267.3**	**-296.2**
4.1. Banque de France	**-171.5**	**-163.5**	**-161.3**	**-168.2**	**-185.6**
4.2. General Government	**44.7**	**49.3**	**50.1**	**46.4**	**42.5**
4.3. Monetary Financial Institutions	**44.2**	**-56.8**	**-82.8**	**-98.6**	**-122.7**
4.3.1. Currency and Deposits	-353.6	-471.1	-552.7	-592.2	-898.8
4.3.2. Loans and Others	397.7	414.5	470.0	493.6	776.2
4.4. Other Sectors	**-15.6**	**5.3**	**-12.7**	**-46.9**	**-30.4**
4.4.1. Currency and Deposits	250.6	324.6	337.2	352.6	135.3
4.4.2. Loans and Others	-265.0	-317.3	-347.8	-390.2	-156.5
5. Reserve Assets	**118.2**	**126.9**	**139.2**	**130.4**	**145.6**
6. International Investment Position	**-335.7**	**-284.2**	**-290.6**	**-452.1**	**-455.4**

Notes: in billions of Euros. Source: National Accounts.

Construction of agent-level data and sectors. All of our datasets contain individual identifiers. Firms (including non-financial non-financial firms, as well as banks) are identified by the unique 9-digit SIREN number. Banks have also a 5-digit unique identifier called CIB. Securities are identified by their unique ISIN number. The PI data reports the Legal Entity Identifier (LEI) of the security issuer, which in turn can be mapped into the SIREN and CIB. To this end, we employ concordance tables created by the "Recherche dans le registre des agents financiers" (Regafi) to link SIREN, CIB and LEI, and thus being

able to merge each legal entity's positions reported in each dataset. This procedure allow us to create the consolidated positions for each legal entities on all its positions in direct investment, securities and other investment.

Identifying large agents implies going beyond legal-entity firms and constructing groups, as multinational corporations/banks/financial agents are typically composed by many legal entities.[31] To create an accurate measure of the dynamics of large agents, we leverage from different datasets provided by the Banque de France and create groups by identifying their "ultimate owners". All our datasets contain individual identifiers at the firm-level (always for resident firms and in some cases also for non-resident firms) or at the security level (in the case of PI). We use those identifiers in order to delineate the perimeter of economic groups in our data. We aggregate firms by creating groups based on the ultimate ownership criterion. We use a set of additional data that track ownership links between individual units in our data. The LiFi dataset, constructed by INSEE with input from other sources (including the Banque de France) provides us information about equity participation and the name of the parent company (be it resident in France or abroad), and in which resident firms are identified by the Siren number. To identify banking groups we use data from the Registry of Financial Agents REGAFI (*Registre des agents financiers*) collected by the French Macroprudential Authority (ACPR). Based on the bank identifier CIB (*Code InterBancaire*), the REGAFI register provides the name of the economic group to which each bank belongs. Bloomberg's Ultimate Owner Data is used to identify groups based on the LEI number.

We proceed in several steps. We first stack all the datasets and first use the LiFi and REGAFI datasets to identify units that belong to the same group. Second, we use a concordance between LEI and SIREN, obtained from the LEI official website, to assign security-level PI observations to the groups created in the previous step. Third, we use the Bloomberg ultimate owner data that provides the ultimate owners for firms worldwide, where firms are identified by their LEI number. Fourth, we gather online data on the names of affiliates of the biggest French firms (those in the CAC40) and use those names to match firms into groups. In the end, 16% of our groups are firms for which we still did not manage to identify the group to which they belong to. These can be stand along firms or actually belong to larger groups and, hence, our estimate are a lower bound on the number of groups. For expositional simplicity, we count them as a "group" composed then by only one firm.

Our datasets contain information about the institutional sector of the individual legal entity, defined as in the European System of Accounts (ESA 2010). This classification includes five broad categories:

[31] The distinction between legal entities and corporations is particular relevant in portfolio and other investment, as financial firms belonging to the same financial corporation might issue securities separately. For example, typically bank have a CIB identifier for their commercial activities while creating separate legal entities to issue and hold securities. Accounting for the overall position of the bank implies consolidating these different securities issuance.

Non-financial corporations (S11), Financial sector (S12), General government (S13), Households (S14) and Non-profit institutions serving households (S15). These are disaggregated further. For example, Financial sector includes Monetary Financial institutions (the Central Bank, commercial banks, money-market funds) and Non-Monetary Financial institutions (Investment funds, Insurance corporations, Pension funds, Other financial intermediaries, Captive financial institutions and Financial auxiliaries). Our groups contain potentially a larger number of legal entities operating in different institutional sectors. In order to classify groups into broad institutional sectors, we use the value of the assets and liabilities of the entities. We define a group as a *corporation* if the majority of its assets (liabilities) are registered in real sector activities. Otherwise, we classify it as *financial groups*. Financial groups then include banks, pension funds, insurance companies, and all other legal entities whose assets (liabilities) are not invested in real sector activities.

We restrict the sample to private groups, excluding the French government and national agencies (e.g., Agence Française de Développement). These entities are included solely in Table 3 for comparative purposes.

Other datasets. We also employ two other datasets produced by the Banque de France.

-**FIBEN**: We use administrative balance sheet and income statement data from the FIBEN (Fichier Bancaire des Entreprises) database. The data are collected by the Banque de France through its networks of branches throughout France, for the purpose of awarding credit ratings to firms in the real sector. The data provide information on firms' sales, assets, employment and sectors for firms with annual sales higher than €750,000, across all sectors of the economy. The dataset contains around 290,000 firms per year, which account for 85% of total sales in the French economy.

-**Credit registry**: We also employ bank-firm data for domestic loans from the French National Credit Register, collected by the prudential authority of the Banque de France. The dataset is constructed from mandatory reporting of credit exposures by all domestic credit institutions (i.e., banks). The dataset covers all firms with annual loans exceeding €25,000.

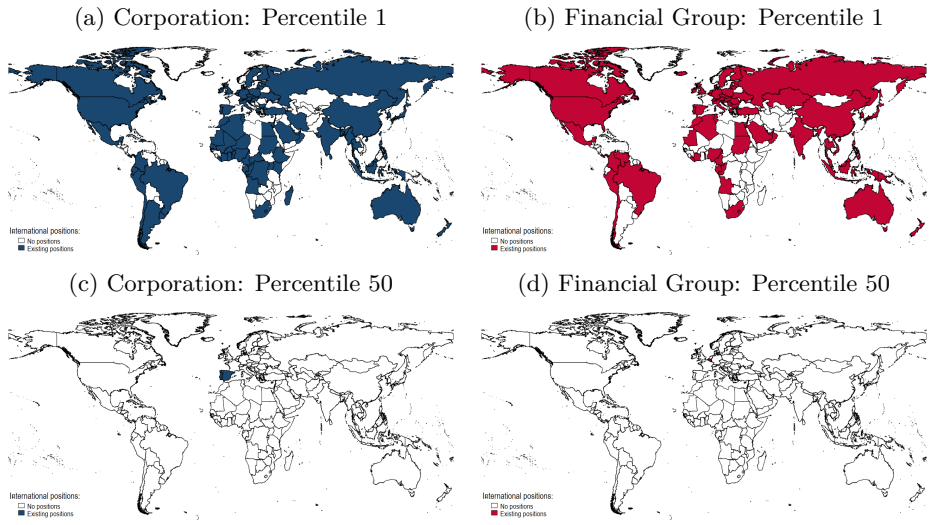
In Section 6, we focus on multi-bank firms, which we define as those maintaining loan agreements with at least three banks in a given month. This definition is applied at the monthly frequency, consistent with the identification of banks' idiosyncratic shocks at that same frequency. As reported in Table B.1 in Appendix B, after restricting the sample to multi-bank firms, the data contain on average 858,302 observations per year between 2013 and 2018, covering 354 deposit-taking institutions (identified by their cib codes) and 27,099 firms per year (identified by their siren codes).[32]

[32]Multi-bank relationships defined at the month level account for approximately 34% of corporate loans in France. Consistent with Khwaja and Mian (2008), the prevalence of multi-bank firms declines when examined at higher frequencies.

Appendix B Additional Figures and Tables

Additional Figures

Figure B.1: France's Financial Internationalization



Notes: The figure shows the geographical distribution of cross-border positions, distinguishing patterns across categories (corporations and financial groups) and sizes (median and top 1st percentile). Panels a and b report the median corporation and financial group, while panels c and d report the top 1st percentile of each category. Period 2014-2018.

Figure B.2: Data: Comparison with National Accounts, 2014-2018

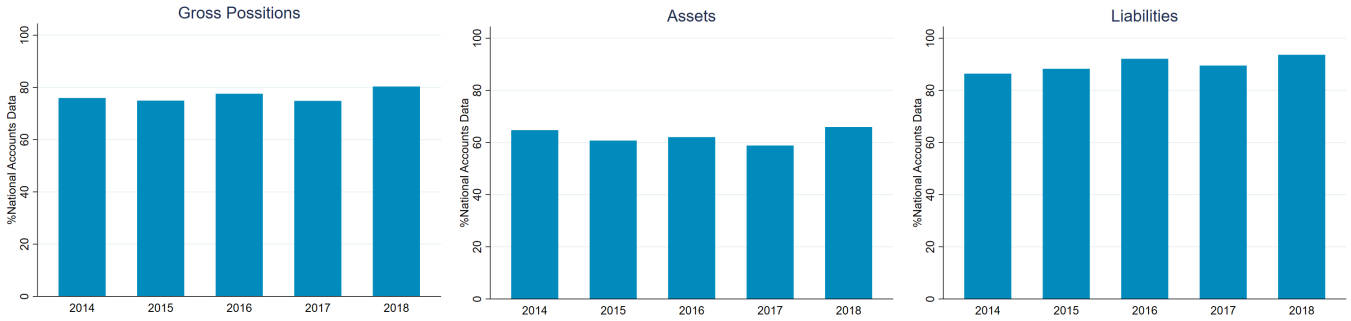


Figure B.3: Capital-labor ratios across countries: deviation from mean values

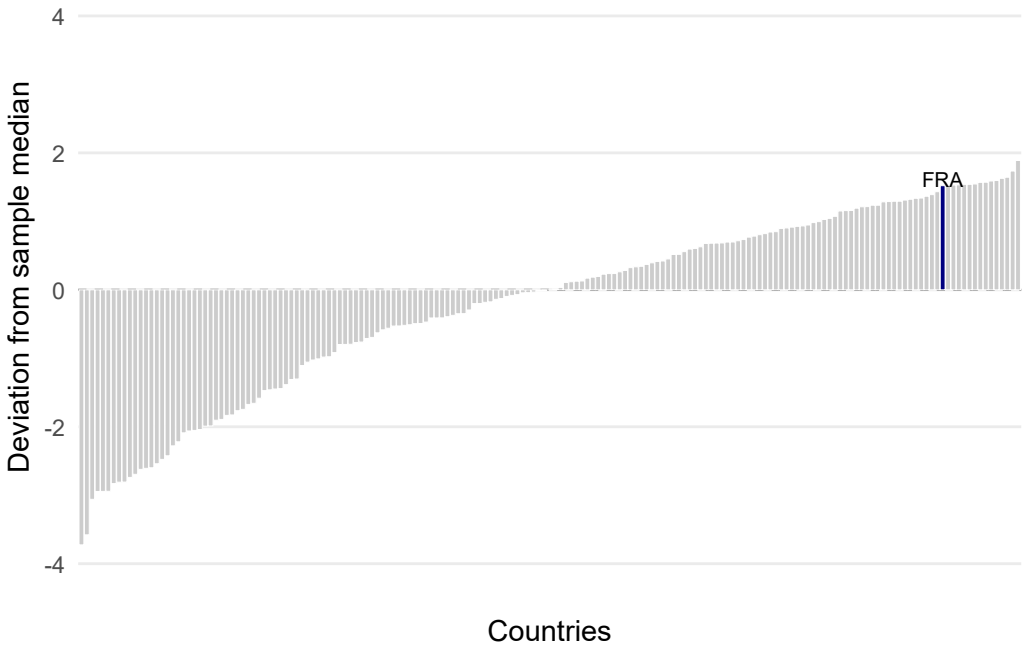


Figure B.4: Granularity by Countries and Currencies

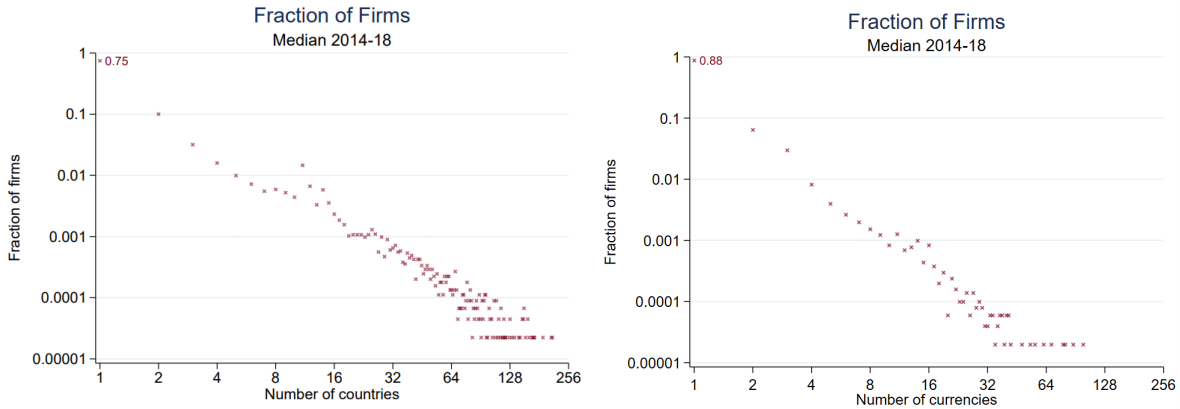


Figure B.5: Granularity by Countries and Currencies

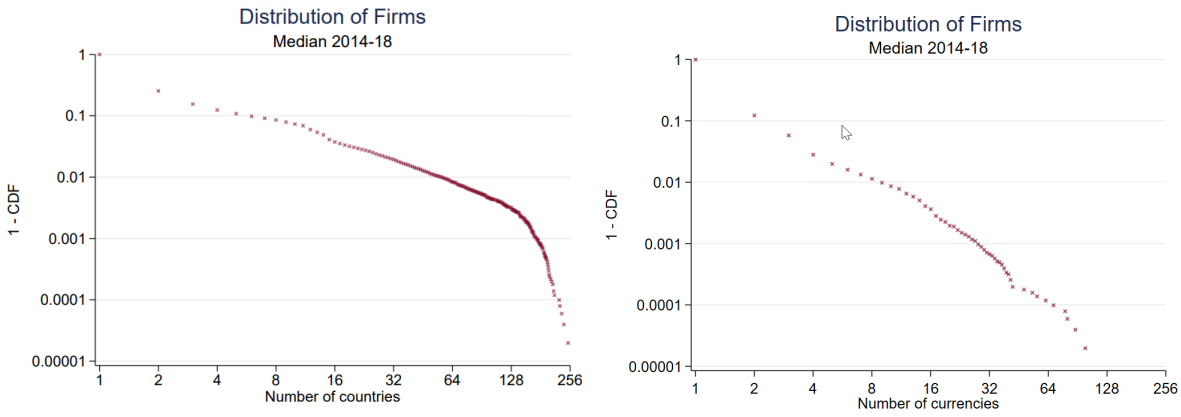


Figure B.6: Granularity by Sector

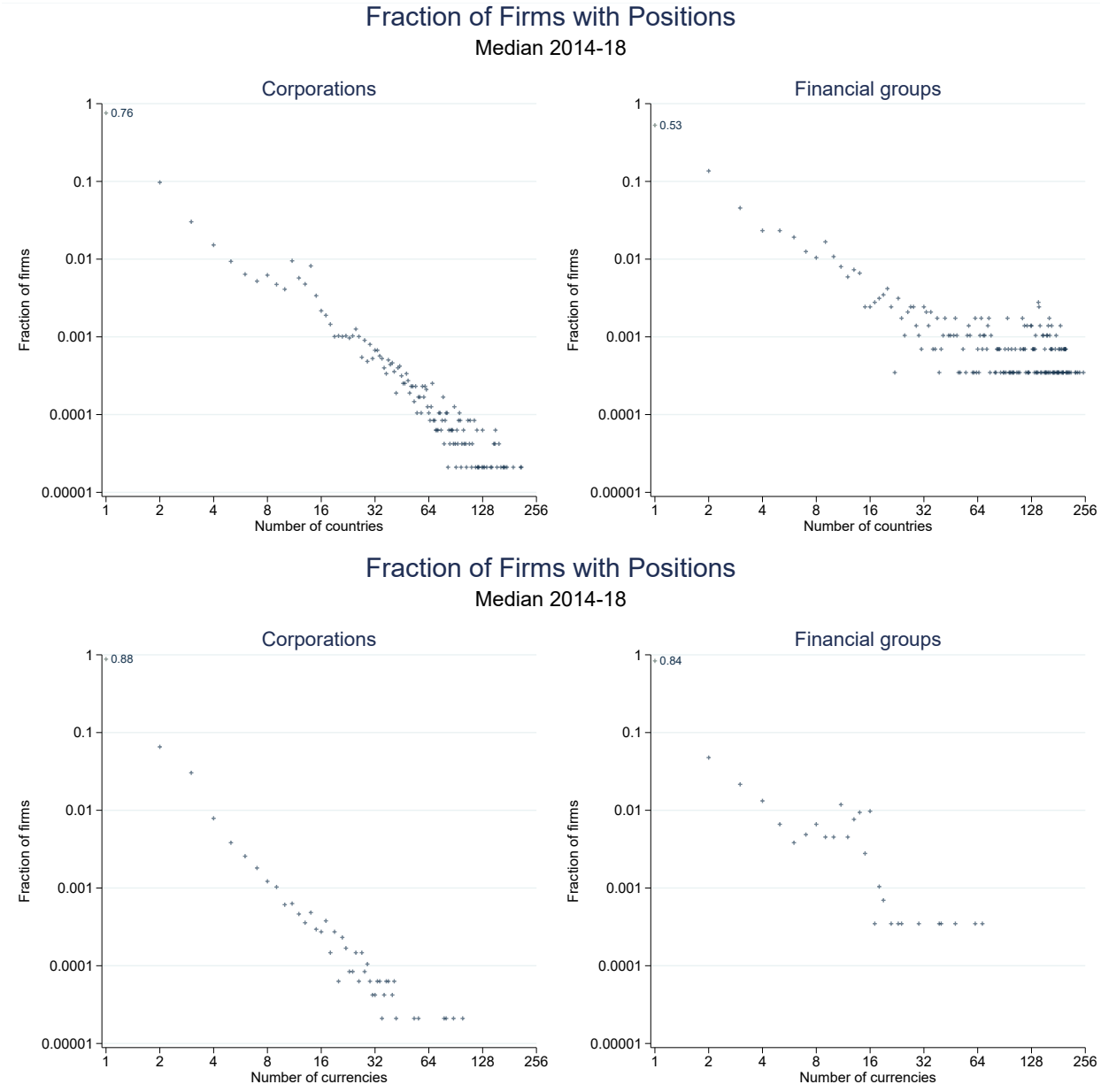


Figure B.7: Newly Internationalized Firms: counterpart countries

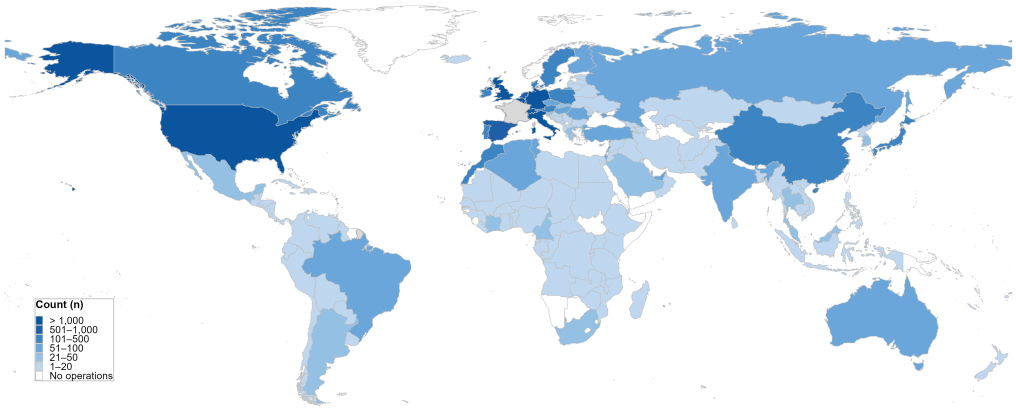


Figure B.8: Semi-Elasticity of Financial Flows to Bank-Specific Idiosyncratic Shocks by Country

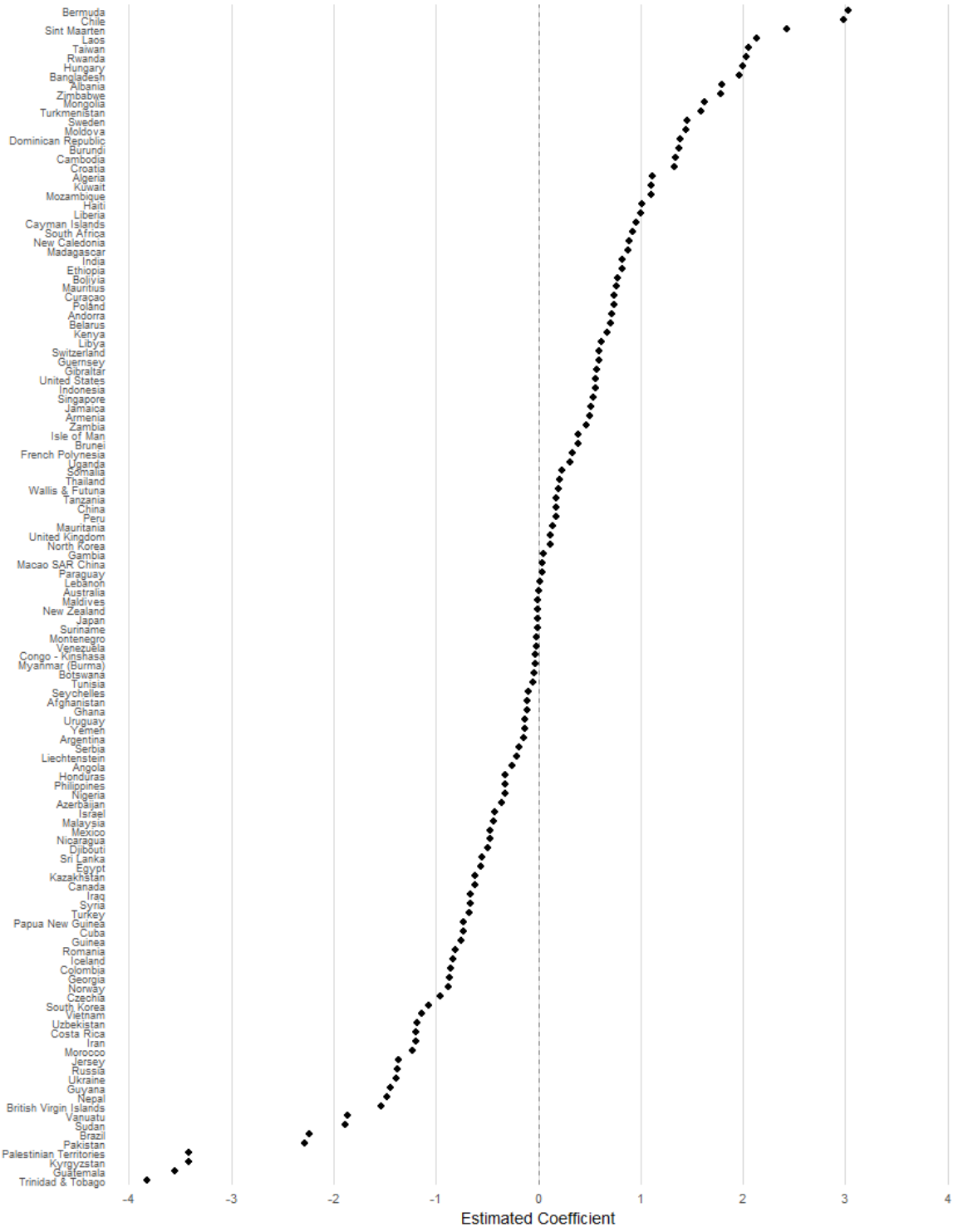
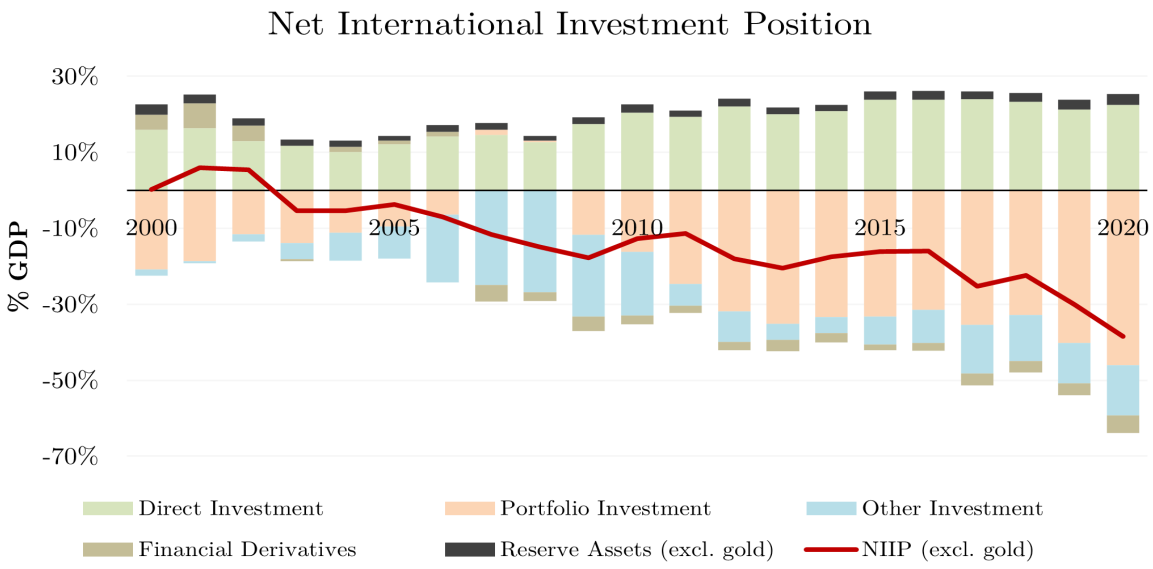


Figure B.9: France's Net International Investment Position



Additional Tables

Table B.1: Summary Statistics: Credit Registry Data

	Number of observations	Number of Deposit Institutions	Number of Firms
	(1)	(2)	(3)
2013	725,159	370	23,113
2014	786,664	352	24,748
2015	837,045	348	26,471
2016	873,429	341	27,501
2017	916,553	336	28,969
2018	1,010,964	318	31,794
Average 2013-18	858,302	344	27,099

Notes: this table reports data for multi-bank firms. Deposit institutions are considered at the CIB level and firms at the SIREN level.

Table B.2: Segmentation: Comparison with International Trade

	Number of Countries	
	Finance	**Trade**
	(1)	(2)
Top 100 groups	80	60
Top 1 percentile (p99-p99.74)	30	37
Top 5 percentile (p95 to p98)	8	21
Top 10 percentile (p90 to p94)	4	13
Top 50 percentile (p50 to p89)	1	4
Bottom 50 percentile (p1 to p49)	1	1

Note: columns 1 and 2 report report number of countries. Gross values are asset plus liabilities for financial operations, and exports plus imports for trade flows. Average 2014-18.

Table B.3: Corporations Not-Engaged in International Trade

	Corporations without Int'l trade
	(1)
Top 100 groups ($\approx$ top p0.26)	0.60
Top percentile 1 (p99–p99.74)	0.74
Top percentile 5 (p95–p98)	0.64
Top percentile 10 (p90–p94)	0.49
Top percentile 50 (p50–p89)	0.54
Bottom percentile 50 (p1–p49)	0.70

Note: In %. This table shows the share of corporations participating in international financial operations and without engaging in international trade. Average 2014–18.

Table B.6: Top 50 Asset Management Firms in France

Asset management firms (top 50)			
AG2R La Mondiale AM	Degroof Petercam AM	The French Woman	OFI Invest AM
Allianz Global Investors	DWS	Meeschaert AM	Ossiam
ABN AMRO Investment Sol.	Ecofi	Mirova	Ostrum AM
Axiom AI	Edmond de Rothschild AM	Money	Palatine AM
Amundi	Eiffel Investment Group	Montpensier Finance	Pictet AM
AXA Investment Managers	Eres Management	Morgan Stanley IM	Rivage Investment
BNY Mellon IM	Federal Finance Mgmt	Muzinich	Robeco
BFT IM	Groupama AM	Natixis IM	Scor Investment
BNP Paribas AM	Invesco	Neuberger Berman	Schelcher Prince Mgmt
Candriam	JP Morgan AM	Oddo BHF AM	Schroders
CPR AM	La Banque Postale AM	OFI Invest AM	Sienna Management
Credit Mutuel AM	Lazard Brothers Mgmt	Ossiam	Swiss Life AM France
Comgest	Lombard Odier IM	Ostrum AM	Tikehau Capital

Table B.4: Counterfactual Exercises

	Gross position/GDP	**Gross allocation in non-EU countries**	**Gross allocation in non-EUR currencies**
	(1)	(2)	(3)
Current	347	37	35
Counterfactual	1	15	8

Note: In %. Average 2014–2018.

Table B.5: Granularity: Removing State-Owned Firms

Firm size	**Definition**	**Share on National**			**Incremental share**		
		Gross	Assets	Liabilities	Gross	Assets	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Top 100 firms (top percentile 0.26)	Above percentile 99.74	0.51	0.50	0.51			
Top 1 percentile	Above percentile 99	0.58	0.56	0.59	0.07	0.06	0.08
Top 5 percentile	Percentiles 95 to 98	0.62	0.60	0.65	0.05	0.04	0.05
Top 10 percentile	Percentiles 90 to 94	0.63	0.60	0.66	0.01	0.01	0.01
Top 50 percentile	Percentiles 50 to 89	0.64	0.61	0.67	0.01	0.01	0.01
Bottom 50 percentile	Percentiles 1 to 49	0.64	0.61	0.67	0.00	0.00	0.00

Note: fraction of total (absolute value) positions on National Accounts. This table removes the state-owned firms listed in Table **??**. Average 2014-18

Table B.8: Segmentation: Remove State-Owned Firms

	# of countries	# of currencies	# of non-EU countries	Value share in EU	Value share in EUR
	(1)	(2)	(3)	(4)	(5)
Top 100 (≈ top p0.26)	81	13	58	0.68	0.75
Top percentile 1 (p99-p99.74)	31	5	17	0.75	0.88
Top percentile 5 (p95-p98)	9	2	3	0.88	0.99
Top percentile 10 (p90-p94)	4	1	1	0.93	1.00
Top percentile 50 (p50-p89)	1	1	0	1.00	1.00
Bottom percentile 50 (p1-p49)	1	1	0	1.00	1.00

Note: gross (absolute value) positions. Mean values within each rank percentile. Ranks are mutually exclusive. Average 2014-18.

Table B.9: Segmentation: Remove Asset Management Firms

	# of countries	# of currencies	# of non-EU countries	Value share in EU	Value share in EUR
	(1)	(2)	(3)	(4)	(5)
Top 100 (≈ top p0.26)	80	13	57	0.68	0.75
Top percentile 1 (p99-p99.74)	31	4	17	0.75	0.88
Top percentile 5 (p95-p98)	9	2	3	0.88	0.99
Top percentile 10 (p90-p94)	4	1	1	0.93	1.00
Top percentile 50 (p50-p89)	1	1	0	1.00	1.00
Bottom percentile 50 (p1-p49)	1	1	0	1.00	1.00

Note: gross (absolute value) positions. Mean values within each rank percentile. Ranks are mutually exclusive. Average 2014-18.

Table B.7: Granularity: Removing Asset Management Firms

Group rank	**Definition**	**Share on National**			**Incremental share**		
		Gross	Assets	Liabilities	Gross	Assets	Liabilities
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Top 100 groups	Above percentile 99.74	0.50	0.50	0.51			
Top 1 percentile	Above percentile 99	0.57	0.56	0.59	0.07	0.06	0.08
Top 5 percentile	Percentiles 95 to 98	0.62	0.60	0.64	0.05	0.04	0.05
Top 10 percentile	Percentiles 90 to 94	0.63	0.60	0.65	0.01	0.01	0.01
Top 50 percentile	Percentiles 50 to 89	0.64	0.61	0.66	0.01	0.01	0.01
Bottom 50 percentile	Percentiles 1 to 49	0.64	0.61	0.66	0.00	0.00	0.00

Note: fraction of total (absolute value) positions on National Accounts. This table removes the top 50 asset management firms listed in Table B.6. Average 2014-18

Table B.10: Segmentation by Category in National Account Data

	Some combination of DI, PI and OI	**Either DI, PI or OI**	**Either DI, PI, OI**		
			% of column 2		
			Only DI	Only PI	Only OI
	(1)	(2)	(3)	(4)	(5)
Top 100 groups (Top percentile 0.26)	0.96	0.04	0.00	1.00	0.00
Top percentile 1 (p99-p99.74)	0.73	0.27	0.07	0.59	0.33
Top percentile 5 (p95-p98)	0.61	0.39	0.10	0.13	0.77
Top percentile 10 (p90-p94)	0.56	0.44	0.16	0.07	0.77
Top percentile 50 (p50-p89)	0.24	0.76	0.62	0.07	0.32
Bottom percentile 50 (p1-p49)	0.01	0.99	0.93	0.04	0.03

Note: Values are averages from 2014-18.

Table B.11: Segmentation: Nationality Basis

	All firms			**Corporations**			**Financial groups**		
	# of countries	# of countries outside EU	Value share in EU	# of countries	# of countries outside EU	Value share in EU	# of countries	# of countries outside EU	Value share in EU
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Top 100 groups (Top percentile 0.26)	93	68	0.48	95	69	0.42	90	65	0.50
Top percentile 1 (p99-p99.74)	50	34	0.52	32	18	0.52	69	49	0.51
Top percentile 5 (p95-p98)	8	2	0.83	5	2	0.90	65	44	0.59
Top percentile 10 (p90-p94)	4	1	0.91	3	1	0.93	63	42	0.61
Top percentile 50 (p50-p89)	1	0	1	1	0	1	61	41	0.72
Bottom percentile 50 (p1-p49)	1	0	1	1	0	1	1	1	0.72

Note: Values are averages from 2014-18.

Table B.12: Newly Internationalized Corporations: Foreign vs Domestic Control

	Foreign Control	**Domestic Control**	**Log differences in means. P-values**
	(1)	(2)	(3)
Share on newly internationalized firms	0.61	0.39	
Share on employment of newly internationalized firms	0.33	0.67	
Share on sales of newly internationalized firms	0.35	0.65	
Share on gross IIP of newly internationalized firms	0.37	0.63	
Employment	35	108	0.04**
Sales*	9,434	26,514	0.00***
Fixed Assets*	5,573	10,406	0.00***
Log TFPR	3.44	3.47	0.61
Leverage	0.64	0.52	0.00***
Investment Rate	0.18	0.16	0.59

Notes: *, **, *** significant at 10, 5, and 1 percent. Sales and fixed assets are expressed in thousands of euros. We define we define foreign control as a foreign ownership share of 50% or more, and domestic control otherwise. Column 3 reports the p-values of the log difference of the means. Leverage is total debt over assets. Investment rate is measured as the change in fixed assets divided by lagged fixed assets. Year 2014.

Table B.13: Performance after Financial Internationalization: Domestic vs Foreign Control I

	Δ Fixed Assets	**Δ Employment**	**Δ Capital-Labor Ratio**	**Δ Sales**	**Δ Export Share**	**Export Dummy**	**Import Dummy**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$I_{i,t} \times$ Domestic control$_{i,t}$	0.017*	0.013**	0.003	0.004	-0.029**	-0.002	0.011**
	(0.009)	(0.006)	(0.010)	(0.003)	(0.014)	(0.006)	(0.006)
$I_{i,t} \times$ Foreign control$_{i,t}$	0.052***	0.009	0.041***	0.009**	-0.032**	0.011*	0.008
	(0.010)	(0.007)	(0.012)	(0.004)	(0.016)	(0.007)	(0.006)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5-digit sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.072	0.031	0.038	0.043	0.047	0.024	0.020
N	358,155	355,411	353,392	359,968	360,572	390,710	390,710

Notes: *, **, *** significant at 10, 5, and 1 percent. Dependent variable: $\Delta Y_{i,t} = ln(Y_{i,t+1}) - ln(Y_{i,t-1})/2$. Firm-level controls include log TFPR, log gross assets, log import share, log export share and log leverage in the initial year (2014). Columns 6 and 7 do not include the control for log import share and log export shares, as these firms are by definition non-importers and non-exporters.

Table B.14: Performance after Financial Internationalization: Domestic vs Foreign Control II

	Δ Leverage	**Δ Domestic Bank Leverage**	**Δ Domestic Bank ST Leverage**	**Δ Domestic Bank LT Leverage**	**Δ Interest Coverage**
	(1)	(2)	(3)	(4)	(5)
$I_{i,t} \times$ Domestic control$_{i,t}$	0.005	-0.011^d	-0.048*	0.006	-0.090**
	(0.006)	(0.027)	(0.029)	(0.034)	(0.046)
$I_{i,t} \times$ Foreign control$_{i,t}$	0.005	-0.120***	-0.126***	-0.084*	-0.144***
	(0.007)	(0.035)	(0.039)	(0.044)	(0.056)
Firm-level controls	Yes	Yes	Yes	Yes	Yes
5-digit sector FE	Yes	Yes	Yes	Yes	Yes
R^2	0.044	0.015	0.007	0.020	0.013
N	312,333	259,089	230,576	212,332	334,679

Notes: *, **, *** significant at 10, 5, and 1 percent. ^{d} significant at 15 percent. Dependent variable: $\Delta Y_{i,t} = ln(Y_{i,t+1}) - ln(Y_{i,t-1})/2$. Firm-level controls include TFP, gross assets, import and export share and leverage in the initial year (2014). Interest coverage is interest over earning before interest and taxes.

Table B.15: Biases in Allocations: Univariate Regressions

	Independent variable:							
	EU	**EUR**	**Distance**	**GDP**	**Common Language**	**Common colonial History**	**Common Legal System**	**Institutional Quality**
	Firm-Level Analysis. Average Effect. Dep. Var.: $s_{i,c,j,\kappa,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
var	0.029*	0.065***	-0.021***	-0.001	0.054***	-0.002	0.015	0.016***
	(0.017)	(0.014)	(0.007)	(0.004)	(0.012)	(0.012)	(0.017)	(0.005)
Constant	0.051***	0.021***	0.067***	0.070***	0.058***	0.070***	0.060***	0.068***
	(0.010)	(0.005)	(0.009)	(0.009)	(0.008)	(0.010)	(0.012)	(0.009)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.005	0.018	0.009	0.001	0.012	0.001	0.002	0.006
N	2653950	2653950	2653950	2653950	2653950	2653950	2653950	2653950

Notes: *, **, *** significant at 10, 5, and 1 percent. Standard errors clustered at the country level.

Table B.16: Countries excluded due to exchange-rate pegs or anchors

Anchored/pegged to the euro
Benin; Bosnia and Herzegovina; Bulgaria; Burkina Faso; Cabo Verde; Cameroon; Central African Republic; Chad; Comoros; Cote d'Ivoire; Denmark; Equatorial Guinea; Gabon; Guinea-Bissau; Mali; Niger; North Macedonia; Republic of the Congo; Sao Tomé and Príncipe; Senegal; Togo.
Anchored/pegged to the U.S. dollar
American Samoa; Antigua and Barbuda; Bahamas; Bahrain; Barbados; Belize; Dominica; Ecuador; El Salvador; Grenada; Guam; Hong Kong SAR; Jordan; Marshall Islands; Micronesia (Federated States of); Oman; Palau; Panama; Puerto Rico; Qatar; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; Saudi Arabia; Timor-Leste; U.S. Virgin Islands; United Arab Emirates.

Table B.17: Median number of countries of banks reported in Credit Registry and IIP Data

	Number of countries
Top 100 groups	108
Top 1 percentile (p99 to p99.74)	74
Top 5 percentile (p95 to p98)	130
Top 10 percentile (p90 to p94)	130
Top 50 percentile (p50 to p89)	106
Bottom 50 percentile (p1 to p49)	18
Share of groups	0.61

Note: median number of countries of banks holding cross-border asset positions and present in both credit registry and IIP datasets. Year 2014. Median values per category.

Table B.18: Summary Statistics

Panel A. Banks' Idiosyncratic Shocks in France

Obs.	Banks	Mean	S.D.	p5	p25	p50	p75	p95
20,470	354	0.00	12.26	-17.15	-2.88	0.11	3.13	16.50

Panel B. Semi-Elasticity of Financial Flows to Bank-Specific Idiosyncratic Shocks

Obs.	Countries	Mean	S.D.	p5	p25	p50	p75	p95
40,568	132	0.04	1.82	-2.40	-1.03	-0.12	1.03	2.93

Note: Panel A reports the distribution of banks' idiosyncratic shocks in France estimated following the methodology of Amiti and Weinstein (2018) for the period 2013m1–2018m12. Panel B reports the semi-elasticity of financial flows to bank-specific idiosyncratic shocks estimated in equation (10).

Table B.19: Robustness exercises: Impact of Banks' Idiosyncratic Shocks on the Exchange Rate

	Dependent variable: ΔER_{cm} (% change)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}}$	-5.1640**		-4.6042**			
	(2.38)		(2.19)			
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^1$		-2.7506		-2.6053		
		(6.41)		(6.42)		
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^2$		0.7100		0.5415		
		(4.54)		(4.53)		
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^3$		-5.6110		-5.6631		
		(5.55)		(5.53)		
$\widehat{\ln \text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^4$		-11.3575**		-9.3253**		
		(5.63)		(4.56)		
$\widehat{\text{flow}}_{cm}^{\text{granular}}$					-0.0001**	
					(0.00)	
$\widehat{\text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^1$						-0.0001
						(0.00)
$\widehat{\text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^2$						-0.0000
						(0.00)
$\widehat{\text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^3$						-0.0002
						(0.00)
$\widehat{\text{flow}}_{cm}^{\text{granular}} \times Q_{cy-1}^4$						-0.0003**
						(0.00)
Constant	0.0023***	0.0023***	0.0022***	0.0023***	0.0021***	0.0022***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Date FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.3486	0.3437	0.3533	0.3492	0.3525	0.3480
Observations	7,509	5,976	7,569	5,952	7,809	6,192

Notes: Robust standard errors in parentheses. *, **, *** denote significance at the 10, 5, and 1 percent levels, respectively. Columns 1 and 2 exclude tax havens countries. Columns 3 and 4 exclude the United States, Japan, Switzerland and the United Kingdom. Columns 5 and 6 use flows in levels. All regressions include a constant term.

Table B.20: Summary Statistics: Banks' shares on country's net financial flows

	Q_c^1	Q_c^2	Q_c^3	Q_c^4
Mean	-0.189	-0.001	0.002	0.504
Median	-0.009	-0.000	0.002	0.025

Appendix C Newly Internationalized Firms: Conceptual Framework

This section rationalizes the funding channel of financial integration using a simple conceptual framework based on the pecking order theory of capital structure (Donaldson 1961, Myers and Majluf 1984, among others).

Assume a non-public firm that can undertake a fixed investment project $I > 0$ financed raising external funds.[33] The firm can raise funds from local banks $D \geq 0$. There are financial imperfections in the domestic financial system such that the firm pays an interest rate r that depends on the debt level. As such, the cost of domestic bank debt is convex—i.e., $C'_D > 0$ and $C''_D \geq 0$—and given by $C_D(D) = (1 + r_{(D)})D$. The firm can also raise equity $E \geq 0$, which—since the vast majority of corporations engaging in international finance are non-listed firms, and we do not observe firm changes in private equity with domestic residents—we assume it is entirely from foreign investors.[34] We model foreign equity issuance costs as comprising both a fixed and a proportional component. This structure captures the fixed costs of accessing foreign markets and variable costs such as dilution, underwriting fees, and adverse selection. It is consistent with structural models of financing frictions (e.g., Hennessy and Whited (2005, 2007)) and with asymmetric information models in which equity issuance entails a discount (e.g., Myers and Majluf (1984)). In particular, the firm needs to pay a fixed costs $\kappa > 0$ and a per–unit cost $\tau \geq 0$ for raising equity from foreign investors. Its foreign equity cost is $C_E(E) = \kappa \mathbf{1}\{E > 0\} + (1 + \tau)E$.

The firm minimizes its total financing costs:

$$\min_{D,E \geq 0} \; C_D(D) + C_E(E) = (1 + r_{(D)})D + \kappa \mathbf{1}\{E > 0\} + (1 + \tau)E$$

$$\text{subject to } I = D + E.$$

If the firm only finances with debt and does not issue foreign equity, it sets debt equal to investment $D = I$, and its total financing cost becomes:

$$C^{\text{only D}} = (1 + r_{(I)})I. \tag{18}$$

If the firm borrows domestically and issues foreign equity, it pays a fixed cost κ and chooses domestic

[33] For simplicity, we assume that the firm does not have cash flows. Including cash flows would not affect the nature of the firm's problem. The firm would raise external funds F to finance its investment by the difference between the investment project and the cash flows (ω): $F \equiv I - \omega > 0$

[34] A valid question is why firms do not only raise equity from domestic investors. Given that our data is limited to cross-border operations, we leave this question for further research. We note that, in practice, domestic private equity could not have been available at the scope needed by the firm during the period under analysis or could have been more costly.

borrowing to minimize its financing costs. The first order condition for domestic bank debt gives the following optimal debt level

$$D^* = \frac{\tau - r_{(D^*)}}{r'_{D^*}}. \tag{19}$$

We assume that foreign equity investors face higher frictions than domestic banks, e.g., higher informational asymmetries or being the residual claimants in case of default, and let $\tau > r_{(D)}$, $\forall D > 0$, such that equity is more expensive at the margin. As such, the firm borrows to its optimal debt level D^* and issued equity for $E^* = I - D^*$. The total financing costs of the mix financing is

$$C^{D\&E} = (1 + r_{(D^*)})D^* + \kappa + (1 + \tau)(I - D^*). \tag{20}$$

The firm seeks foreign equity investors whenever the cost of only financing from local banks is higher than the mix financing. In particular,

$$C^{\text{only D}} \geq C^{D\&E}. \tag{21}$$

Substituting the optimal debt level of equation (19) into (21) and after some algebra, we can define an investment threshold $\bar{I}$ such that above it, the firm also raises equity from foreign investors

$$\bar{I} = \left(\kappa - \frac{(r_{(D^*)} - \tau)^2}{r'_{D^*}}\right)\frac{1}{(r_{(I)} - \tau)}.$$

If $I < \bar{I}$ and the project requires fewer funds than the investment threshold, the firm does not raise equity from foreign investors and only borrows from local banks:

$$D = I \qquad \text{and} \qquad E = 0.$$

If $I > \bar{I}$ and the project requires higher funds than the investment threshold, the firm raises foreign equity and leverage down to target:

$$D^* = \frac{\tau - r_{(D^*)}}{r'_{D^*}} \qquad \text{and} \qquad E = I - D^*.$$

To see how domestic market imperfections and the firm's investment needs affect its choice of raising equity from foreign investors, we let the convex cost of debt be composed by a risk-free rate and a risk premium increasing with the debt level, i.e., $r_{(D)} = r^f + \phi\frac{D}{2}$. Total debt cost becomes:

$$C_D(D) = (1 + r_{(D)})D = (1 + r^f)D + \phi\frac{D^2}{2}.$$

The optimal bank debt and foreign equity under the mix strategy become

$$D^* = \frac{\tau - r^f}{\phi}, \quad E^* = I - \frac{\tau - r^f}{\phi} \qquad \text{if } I > \bar{I}.$$

Replacing the optimal debt level into equation (21), the firm raises equity from foreign investors whenever

$$\frac{\phi}{2}\left(I - \frac{\tau - r^f}{\phi}\right)^2 \geq \kappa, \tag{22}$$

and the investment threshold becomes

$$\bar{I} = \frac{\tau - r^f}{\phi} + \sqrt{\frac{2\kappa}{\phi}}. \tag{23}$$

We can define the probability of raising foreign equity as $Pr(I > \bar{I})$. From equation (22), it is straightforward to see that the higher the firm's investment needs, the more likely the firm is to raise equity from foreign investors:

$$\frac{\partial Pr(I > \bar{I})}{\partial I} > 0.$$

Furthermore, the higher the domestic financial frictions—more convex the cost debt function—, the higher the probability of raising foreign equity. Formally,

$$\frac{\partial \bar{I}}{\partial \phi} = -\frac{\tau - r^*}{\phi^2} - \frac{1}{2}\sqrt{2\kappa}\,\phi^{-3/2} < 0.$$

Note finally that the probability of raising equity from foreign investors decreases with the fixed cost of equity—$\frac{\partial Pr(I>\bar{I})}{\partial \kappa} < 0$—and with the marginal cost of equity—$\frac{\partial Pr(I>\bar{F})}{\partial \tau} < 0$—, such that the firm is more likely to raise equity from investors from countries in which there are less informational frictions, such as sharing similar legal system, etc.

Appendix D Comparison with World Allocation

The previous sections have shown that the internationalization pattern of granular groups differs substantially from those of groups in the bottom 99 percentiles. The international finance literature—based in the textbook International Capital Asset Pricing Model (ICAPM)—establishes that under frictionless and complete capital markets, all investors should hold the world market portfolio (French and Poterba 1991 Lewis 1999, and Obstfeld and Rogoff 1996). To place our findings in perspective, we therefore benchmark the allocations of granular and non-granular groups against the world allocation. Our aim is not to test the ICAPM, but rather to use the world allocation as a benchmark to assess heterogeneity in cross-country allocations across firms. This comparison allows us to assess the extent to which observed heterogeneity reflects deviations from the theoretical benchmark, and thus the role of frictions in shaping cross-border financial integration across firms.

We define $s^j_{i,c,t}$ the share that group i holds in country c in type of stock j—gross positions, assets and liabilities—on firm's overall positions in all countries at t and $m^j_{c,t}$ the world weights in country c in each type of stock j at t. In particular,

$$s^j_{i,c,t} = \frac{x^j_{i,c,t}}{\sum_i x^j_{i,c,t}} \qquad \text{and} \qquad m^j_{c,t} = \frac{\bar{x}^j_{c,t}}{\sum_c \bar{x}^j_{c,t}}.$$

To assess how firms' allocations in EU and non-EU countries ("Rest of the World", ROW) compares to the world allocation, one can estimate the following regression for each group i and country of destination/source c in t by type of stock j

$$s^j_{i,c,t} = [\beta^j_{ROW} \times 1_{c\in ROW} + \beta^j_{EU} \times 1_{c\in EU}] \times m^j_{c,t} + \mu_i + \varepsilon^j_{i,c,t}, \qquad \forall j = \{\text{gross, asset, liability}\} \quad (24)$$

where $1_{c\in ROW}$ is a dummy if country c is not in EU, and $1_{c\in EU}$ dummy if country c is in EU. μ_i are firm fixed effects. The coefficients of interest are β_{ROW} and β_{EU}, which capture the average distance of the allocation of all groups resident in France with respect to the world allocation. A $\beta_{ROW} = 1$ implies the allocation to ROW countries is similar to the world allocation to ROW countries. A $\beta_{ROW} > 1$ would imply an allocation higher relative to the world allocation. A $\beta_{ROW} < 1$ implies a lower allocation relative to the world allocation.

Equation (24) captures the average distance across all groups in France, but we are interested in the heterogeneous distance across groups in the different percentiles of the distribution, and in particular on the distinction between granular firms and the rest. To assess this, we interact the ROW and EU dummies—$1_{c\in ROW}$ and $1_{c\in EU}$—with dummy variables indicating whether firms are: (i) among the Top

100 groups, $1_{[top100,t]}$, (ii) in the top 1st percentile but excluding the Top 100 groups, $1_{[p1,t]}$, (iii) between the 95th and 98th percentiles, $1_{[p5,t]}$:, and (iv) in the bottom 95th percentile: $1_{[bottomp95,t]}$. We regress

$$\begin{aligned} s_{i,c,j,t} &= \Big[\beta^{ROW}_{top100}(1_{top100} \times 1_{c\in ROW}) + \beta^{ROW}_{p1}(1_{p1} \times 1_{c\in ROW}) \\ &+ \beta^{ROW}_{p5}(1_{p5} \times 1_{c\in ROW}) + \beta^{ROW}_{bottom95}(1_{bottom95} \times 1_{c\in ROW})\Big] \times m_{c,t} \\ &+ [\beta_{EU} \times 1_{c\in EU} \times m_{c,t}] + \mu_i + \varepsilon_{i,c,j,t}. \end{aligned} \tag{25}$$

The coefficients of interests are β^{ROW}_{top100}, β^{ROW}_{p1}, β^{ROW}_{p5} and $\beta^{ROW}_{bottom95}$, which capture whether the allocation of each group percentile in non-EU countries differs from the world allocation on non-EU countries. An estimated coefficient close to one would imply that the group percentile has an allocation close to the world allocation. Coefficients lower than one imply under-allocation relative to the world allocation.

Column 1 of Table D.1 reports the coefficients from equation (24), estimated for gross positions. The estimated coefficient for non-EU countries, β_{ROW}, is 0.46 and implies that, on average, groups in France allocate a lower share to non-EU countries than what the rest of the world does. By contrast, the coefficient of β_{EU} is 1.419, indicating a higher allocation in EU countries than the world. This higher allocation in EU countries is expected given the large integration across the EU members.

We are interested in how these allocations differ across groups in the distribution. Column 2 of Table D.1 presents the results of equation (25), which reveal a clear distinction across groups. The Top 100 groups have an allocation in non-EU countries at levels close to the world allocation, with an estimated coefficient of $\beta^{ROW}_{top100} = 0.828$. The coefficient for firms in the top 1st percentile (excluding the Top 100) falls to 0.661 and continues to decline monotonically across the distribution. For groups in the bottom 95th percentile, the coefficient is only 0.43—almost half the size of that for the Top 100 groups. This result highlights again a clear distinction between the internationalization of granular firms and the rest: whereas granular firms allocate operations close to the world benchmark, the bottom 99 percentiles allocate only about half as much to non-EU countries. They also provide supportive evidence for our previous finding that firms in the lower percentiles face frictions to operating in international financial markets, whereas granular firms are more sophisticated and can overcome these frictions. These firms do not denote any type of currency, institutional or gravity bias and can allocate operations close to the world benchmark.

We further interact the EU dummy across group percentiles. As column 3 reports, the heterogeneity across firms is less pronounced. Granular groups allocate more in EU countries than the world average, but the difference relative to the rest of groups is small and non significant.

Corporations and financial groups. Table D.2 breaks down the analysis between corporations and financial groups. Remarkably, the estimated coefficient β_{top100}^{ROW} for those corporations in the Top 100 groups is 1.008, indicating that their allocation to non-EU countries is virtually identical to the world allocation (column 1). As above, the coefficient on ROW allocation decreases monotonically along the distribution, with corporations in the bottom 95th percentile showing a coefficient of 0.425—less than half the allocation in Non-EU countries of granular corporations.

The coefficients for financial groups, reported in column 2, are below one, indicating that financial groups tend to allocate less to non-EU countries than what world. Among them, financial groups in the Top 100 show a coefficient 0.516, while those in the bottom 95th percentile have a coefficient of 0.347. The smaller difference between these two groups reflects a less asymmetric allocation between granular and non-granular financial groups. This lower difference is consistent with our intensive-margin results showing that financial groups in the bottom 99th percentiles experience weaker allocation biases and with the view that financial groups—particularly those already large enough to operate internationally—are more sophisticated overall and less susceptible to frictions.

Type of stock. Table D.2 reports the results for assets and liabilities separately. Interestingly, the gap in non-EU allocations between granular and non-granular firms persists. For both assets and liabilities, granular groups allocate much closer to the world benchmark. The coefficients decline monotonically across the distribution: from 0.747 to 0.371 for assets, and from 0.917 to 0.500 for liabilities. For completeness, Table D.3 in Appendix B shows the break down of assets and liabilities for corporations and financial groups.

This appendix has benchmarked the international allocations of firms in France against the world portfolio. The evidence reveals a sharp divide between granular and non-granular firms. Granular groups—particularly the Top 100—hold allocations to non-EU countries that are close to the world benchmark, underscoring their ability to operate internationally. By contrast, firms in the bottom 99 percentiles allocate only about half as much to non-EU countries as granular firms, suggesting persistent biases and barriers to their internationalization.

Taken together, these findings reinforce the central message of the paper: while aggregate statistics portray France as financially integrated with the world, integration at the firm level is highly segmented. Granular firms allocate internationally in line with world allocations, but the vast majority of firms remain regionally concentrated and subject to biases.

Table D.1: Heterogeneous International Allocation across Firms

	$s^j_{i,c,t}$: **Gross group value share in country** c **at** t		
	(1)	(2)	(3)
Share in ROW	0.460***		
	(0.020)		
Share in EU	1.419***	1.414***	
	(0.050)	(0.051)	
Share Top 100 groups in ROW		0.828***	0.828***
		(0.011)	(0.011)
Share Top p1 in ROW		0.661***	0.666***
		(0.016)	(0.016)
Share Top p5 in ROW		0.455***	0.455***
		(0.014)	(0.014)
Share Bottom 95 in ROW		0.430***	0.428***
		(0.029)	(0.029)
Share Top 100 groups in EU			1.544***
			(0.045)
Share Top p1 in EU			1.474***
			(0.042)
Share Top p5 in EU			1.410***
			(0.047)
Share Bottom p95 in EU			1.404***
			(0.055)
Constant	0.236***	0.236***	0.236***
	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes
R^2	0.847	0.847	0.847
N	667,705	667,705	667,705

Notes: *, **, *** significant at 10, 5, and 1 percent. Std. errors are clustered at year level.

Table D.2: Heterogeneous International Allocation across Firms: Type of Stock

	$s^j_{i,c,t}$: **Group value share in country c at t**			
	Gross Positions		**Assets**	**Liabilities**
	Corporations	**Financial Groups**		
	(1)	(2)	(3)	(4)
Share Top 100 groups in ROW	1.008***	0.516***	0.747***	0.917***
	(0.020)	(0.034)	(0.013)	(0.009)
Share Top p1 in ROW	0.856***	0.278***	0.597***	0.745***
	(0.021)	(0.008)	(0.014)	(0.020)
Share Top p5 in ROW	0.480***	0.360***	0.400***	0.523***
	(0.023)	(0.022)	(0.011)	(0.019)
Share Bottom 95 in ROW	0.425***	0.347***	0.371***	0.500***
	(0.032)	(0.033)	(0.026)	(0.034)
Share Top 100 groups in EU	1.437***	1.783***	1.507***	1.575***
	(0.038)	(0.066)	(0.050)	(0.039)
Share Top p1 in EU	1.421***	1.598***	1.446***	1.496***
	(0.064)	(0.039)	(0.048)	(0.036)
Share Top p5 in EU	1.290***	1.788***	1.376***	1.438***
	(0.047)	(0.056)	(0.052)	(0.041)
Share Bottom p95 in EU	1.276***	2.490***	1.357***	1.445***
	(0.041)	(0.163)	(0.060)	(0.049)
Constant	0.287***	0.041***	0.237***	0.236***
	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes
R^2	0.840	0.777	0.847	0.847
N	532,381	135,012	667,705	667,705

Notes: *, **, *** significant at 10, 5, and 1 percent. Std. errors are clustered at year level.

Table D.3: Heterogeneous International Allocation: Assets and Liabilities

	$s^j_{i,c,t}$: Group value share in country c at t & type of stock j			
	Corporates		Financial Groups	
	Assets	Liabilities	Assets	Liabilities
	(1)	(2)	(3)	(4)
Share Top100 groups in ROW	0.914***	1.107***	0.456***	0.585***
	(0.020)	(0.020)	(0.032)	(0.037)
Share Top p1 in ROW	0.769***	0.956***	0.245***	0.317***
	(0.019)	(0.024)	(0.007)	(0.009)
Share Top p5 in ROW	0.420***	0.555***	0.321***	0.407***
	(0.019)	(0.029)	(0.021)	(0.022)
Share Bottom 95 in ROW	0.368***	0.498***	0.309***	0.399***
	(0.028)	(0.037)	(0.030)	(0.037)
Share Top100 groups in EU	1.397***	1.472***	1.753***	1.808***
	(0.043)	(0.032)	(0.071)	(0.061)
Share Top p1 in EU	1.389***	1.447***	1.577***	1.613***
	(0.071)	(0.058)	(0.035)	(0.045)
Share Top p5 in EU	1.254***	1.321***	1.758***	1.811***
	(0.052)	(0.041)	(0.060)	(0.054)
Share Bottom 95 in EU	1.227***	1.320***	2.450***	2.520***
	(0.044)	(0.037)	(0.176)	(0.150)
Constant	0.288***	0.286***	0.042***	0.041***
	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.840	0.841	0.777	0.776
N	532381	532381	135012	135012

Notes: *, **, *** significant at 10, 5, and 1 percent. Std. errors are clustered at year level.