CAHIER D'ÉTUDES
WORKING PAPER

N° 181

DIRECT INVESTMENT POSITIONS HELD BY CAPTIVE FINANCIAL INSTITUTIONS IN LUXEMBOURG AFFILIATED TO INVESTMENT FUNDS FOCUSING ON PRIVATE EQUITY OR REAL ESTATE

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JANUARY 2024

BANQUE CENTRALE DU LUXEMBOURG

EUROSYSTÈME

Direct Investment Positions held by Captive Financial Institutions in Luxembourg affiliated to Investment Funds focusing on Private Equity or Real Estate

First Version: 20 November 2023

This Version: 10 January 2024

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Abstract

This paper presents a new database of direct investment positions held through captive financial institutions (CFIs) in Luxembourg that are owned by (resident and non-resident) investment funds focusing on private equity or real estate. Compared to Di Filippo (2023), the new database is more comprehensive as it includes smaller CFIs with less than 500 million euros in total assets. Over 2011-2021, intra-Luxembourg investment positions were larger than foreign direct investment (FDI) positions (both inward and outward). Most of these intra-Luxembourg investment positions arise because investment funds use Luxembourg CFIs to structure their holdings and acquisitions across the globe. In 2021, only about 1% of the inward FDI position held through these CFIs is ultimately invested in targets located in Luxembourg. The outward FDI position held through these CFIs is invested in private companies (65%) or real estate assets (35%). While most investment fund sponsors are headquartered in the United States or in the United Kingdom, investment targets are mostly in Western Europe, with a focus on the euro area. Outward FDI in private equity targets companies that are quite dispersed across economic activities. In 2021, "Information, telecommunications and computer services" have the largest share (17%), followed by "Electricity, gas, water supply, recycling" (12%) and "Chemicals and non-metallic mineral products" (10%). Outward FDI in real estate is more concentrated by property type, with 45% in commercial buildings (office and retail properties), 24% in industrial buildings (in particular logistics properties) and 15% in residential properties. Targets in Luxembourg are mostly companies operating in finance and insurance activities (private equity) or office properties (real estate).

Keywords: Foreign direct investment, Captive financial institutions and money lenders, Sector S127, Investment funds, Private equity, Real estate

JEL codes: C80, C81, F23, F30, G23, G32

Contact: gabriele.difilippo@bcl.lu **Disclaimer:** This paper should not be reported as representing the views of the Banque centrale du Luxembourg or the Eurosystem. The views expressed are those of the author and may not be shared by other research staff or policymakers in the Banque centrale du Luxembourg or the Eurosystem. **Acknowledgements:** For their suggestions and comments, the author would like to thank Paolo Guarda and Jean-Pierre Schoder. Any remaining errors are the sole responsibility of the author.

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Non-Technical Summary

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Over 2011-2021, intra-Luxembourg investment positions were larger than foreign direct investment (FDI) positions (both inward and outward). Most of these intra-Luxembourg investment positions arise because investment funds use Luxembourg CFIs to structure their holdings and acquisitions across countries. In 2021, only about 1% of the inward FDI position held through these CFIs is ultimately invested in targets located in Luxembourg.

The outward FDI position held through these CFIs is invested in private companies (65%) or real estate assets (35%). While most investment fund sponsors are headquartered in the United States or in the United Kingdom, investment targets are mostly in Western Europe, with a focus on the euro area. Outward FDI in private equity targets companies that are quite dispersed across economic activities. In 2021, “Information, telecommunications and computer services” have the largest share (17%), followed by “Electricity, gas, water supply, recycling” (12%) and “Chemicals and non-metallic mineral products” (10%). Outward FDI in real estate is more concentrated by property type, with 45% in commercial buildings (office and retail properties), 24% in industrial buildings (in particular logistics properties) and 15% in residential properties. Targets in Luxembourg are mostly companies operating in finance and insurance activities (private equity) or office properties (real estate).

Résumé Non Technique

Cet article présente une nouvelle base de données des positions d'investissement direct détenues par les institutions financières captives (CFI) au Luxembourg affiliées à des fonds d'investissement (résidents et non-résidents) axés sur le capital-investissement ou l'immobilier. Par rapport à Di Filippo (2023), la nouvelle base de données est plus complète car elle inclut les CFI dont le total des actifs est inférieur à 500 millions d'euros.

Sur la période 2011-2021, les positions intra-Luxembourg étaient supérieures aux positions d'investissements directs étrangers (IDE) (tant entrants que sortants). La plupart de ces positions intra-Luxembourg résultent du fait que les fonds d'investissement utilisent des CFI au Luxembourg pour structurer leurs détentions et acquisitions à travers différents pays. En 2021, seulement environ 1 % de la position des IDE entrants qui sont détenus à travers ces CFI est finalement investi dans des cibles situées au Luxembourg.

La position des IDE sortants qui sont détenus par ces CFI résidentes est investie dans des entreprises privées (65 %) ou dans des actifs immobiliers (35 %). Alors que la plupart des promoteurs de fonds d'investissement ont leur siège aux États-Unis ou au Royaume-Uni, les cibles de leurs investissements directs se situent principalement en Europe occidentale, en se concentrant sur la zone euro. Les IDE sortants en capital-investissement ciblent des entreprises qui sont assez dispersées à travers les activités économiques. En 2021, les services d'information, de télécommunications et d'informatique détiennent la plus grande part (17 %), suivis par les activités d'électricité, de gaz, d'eau et de recyclage (12 %), et la production de produits chimiques et produits minéraux non métalliques (10 %). Les IDE sortants dans l'immobilier sont plus concentrés par type de propriété, avec 45 % dans les immeubles commerciaux (immeubles de bureaux et de commerces), 24 % dans les bâtiments industriels (notamment les immeubles logistiques) et 15 % dans les immeubles résidentiels. Les cibles au Luxembourg sont principalement des entreprises opérant dans les activités de finance et d'assurance (capital-investissement) ou des immeubles de bureaux (immobilier).

1. Introduction

According to international statistical standards (OECD (2008), IMF (2009)), foreign direct investment (FDI) refers to a category of cross-border investment made by a resident in one economy (the direct investor) with the objective of having control or a significant degree of influence on the management of an enterprise (the direct investment enterprise) that is resident in another economy.[1]

The direct investor must own at least 10 percent of the voting power in the direct investment enterprise.[2] As well as investment in equity that gives control or influence, FDI also includes investment in indirectly influenced or controlled enterprises[3], investment in fellow enterprises[4], intra-group loans or intercompany debt[5] and reverse investment.[6] FDI may also consist of real estate investment, including investment properties and vacation homes.[7]

International statistical standards (OECD (2008), IMF (2009)) recommend that a country's Balance of Payments compiles FDI statistics based on the immediate counterpart country, either for the host country or for the investing country. However, in a world where multinational enterprises (MNEs) set up complex global ownership structures, the concept of immediate counterpart country can be misleading, as it blurs the initial provider of capital (usually located at the top of the ownership structure) and the final recipient of capital (at the end of the ownership chain). This issue is especially important for countries that host global financial centres, as MNEs usually establish several intermediate affiliates in these jurisdictions to manage their business activities and structure their corporate investments in third countries. These intermediate affiliates may complicate the identification of the initial provider of capital and the final recipient. This implies that FDI statistics for countries that host global financial centres may differ substantially when broken down by immediate counterpart country or by other categories, such as initial capital providers or final capital recipients.

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[1] See IMF (2009) Paragraph 6.8 p. 100.
[2] See IMF (2009) Paragraph 6.12 p. 101.
[3] See IMF (2009) Paragraph 6.12 p. 101.
[4] See IMF (2009) Paragraph 6.17 p. 103.
[5] See IMF (2009) Paragraph 6.28 p. 105.
[6] See IMF (2009) Paragraph 6.40 p. 107.
[7] See IMF (2009) Paragraphs 4.34 and 4.39 pp. 55-56 and Paragraph 6.31 p. 105.

In addition, the concentration of MNE affiliates in financial centres can contribute to inflate the inward and outward FDI positions for the host country, making it difficult to understand the amount of FDI that actually benefits the host country. Therefore, it is useful to distinguish transit FDI generated by MNE ownership chains passing through financial centres before reaching their final destination from inward FDI actually invested in the country hosting the financial centre.

Against this background, this paper analyses the FDI positions held by captive financial institutions (CFIs) in Luxembourg. Such an analysis is important because Luxembourg is one of the euro area countries (along with the Netherlands, Ireland and Belgium) with the largest flows of transit FDI that is eventually invested elsewhere (Di Nino (2019)). As a result, a better understanding of the origin and final destination of this pass-through FDI can contribute to a better understanding of FDI dynamics at the regional level and at the global level (Di Nino (2019)). By FDI positions, this paper means the cumulated FDI flows by CFIs over a given period of time. The study concentrates on CFIs affiliated to (resident and non-resident) investment funds focusing on private equity or real estate. Several reasons justify this choice. First, investment funds focusing on private equity or real estate generally seek to take control of their target: a company for private equity funds, properties for real estate funds. Second, according to Hoor (2018), CFIs appear to be a suitable tool for investment funds to structure their investments, notably in private equity or real estate.[8]

This paper should be understood as a sequel to Di Filippo (2023), although it focuses on the downstream part of the financing chain[9] and provides several improvements. First, this paper extends the database on CFIs to include smaller CFIs with less than 500 million euros in total assets. Second, this new database addresses the issue of CFIs owning multiple targets. This provides a more comprehensive picture of the distribution of FDI with more granularity concerning investments in real estate. Third, the paper distinguishes intra-Luxembourg investment positions from FDI positions. Intra-Luxembourg investment positions are usually established between resident CFIs within the holding and acquisition structures used by investment funds to acquire

[8] In 2021, CFIs in Luxembourg owned by (resident and non-resident) investment funds focused on private equity or real estate represent about 25% of the total assets held by resident CFIs and about 38% of the total number of resident CFIs. For more information, see appendix A.

[9] Di Filippo (2023) also examined the upstream part of the financing chain, by investigating the Limited Partners (or the client counterpart).

their targets. FDI positions account for both inward FDI and outward FDI. Fourth, the paper identifies FDI ultimately invested in targets located in Luxembourg.

The remainder of this paper is organised as follows. Section 2 defines direct investment positions and their sub-components. Section 3 presents the various steps required to build the database. It describes the identification of CFIs, the source for their associated balance sheet data, the identification of their respective group, the identification of targets for investment funds focusing on private equity or real estate, and the counterpart country of resident CFIs (immediate counterpart country *versus* the country of the sponsor/target counterpart). Section 4 decomposes direct investment positions over time by types of position. It also decomposes outward FDI positions into main economic activity performed by target companies for FDI in private equity, and into property type for FDI in real estate. Section 5 decomposes direct investment positions by various counterparts, mainly sponsors, targets, external finance providers, and holding and acquisition structure. Section 6 is the conclusion.

2. Measuring direct investment

2.1 Direct investment

This paper defines a direct investment (*DI*) position as follows:

$$DI = NFA^{RE} + E\_DI + D\_DI \qquad (1)$$

With NFA^{RE}, real estate as non-financial assets[10]; *E_DI*, equity as direct investment; and *D_DI*, debt as direct investment

Direct investment positions can include foreign direct investment positions when the position held by a resident CFI involves a non-resident counterpart. Moreover, since investment funds often use intermediate entities (mostly CFIs) in Luxembourg to structure their holdings as well as to acquire their targets, direct investment positions can comprise intra-Luxembourg

[10] Non-financial assets cannot be traded on financial markets and include tangible assets with physical value such as real estate (*e.g.* land, buildings, *etc.*), equipment and vehicles. They can also include intangible assets such as patents, intellectual property and data.

positions in which one resident intermediary (CFI) is owned by another resident intermediary (CFI). In addition, since CFIs may be owned by residents investing in resident targets, direct investment positions can include domestic direct investment positions. Thus overall direct investment positions can be decomposed into foreign direct investment positions, intra-Luxembourg positions, and domestic direct investment positions.

2.2 Domestic direct investment

Domestic direct investment positions (*DDI*) represent the direct investment positions of a resident CFI *vis-à-vis* a resident ultimate owner (liability-side) or a resident target (asset-side).

On the liability side, domestic direct investment positions (*DDI_L*) represent the value of a CFI's equity owned by and net loans from a resident ultimate owner. Hence:

$$DDI\_L_t = \sum_{i=1}^{N} DI\_L_{i,t}^{CTP=resident\ ultimate\ owner} \quad (2)$$

With i denoting a given resident CFI (i=1,…,N), *CTP*, the counterpart and t, the time dimension

On the asset side, domestic direct investment positions (*DDI_A*) represent the value of a CFI's equity in and net loans to a resident target ultimately owned by a resident. Thus:

$$DDI\_A_t = \sum_{i=1}^{N} DI\_A_{i,t}^{CTP=resident\ target\ ultimately\ owned\ by\ a\ resident} \quad (3)$$

2.3 Intra-Luxembourg positions

Intra-Luxembourg positions (*IL*) represent direct investment positions between resident intermediaries that are neither an ultimate owner, nor a target. Given that investment funds generally use a holding and acquisition structure including several resident CFIs to acquire their targets, the counterpart of intra-Luxembourg positions should mostly be resident CFIs.

On the liability side, intra-Luxembourg positions (IL_L) represent the value of a CFI's equity owned by and net loans from resident companies excluding ultimate owners. Thus:

$$IL\_L_t = \sum_{i=1}^{N} DI\_L_{i,t}^{CTP=resident\ intermediary} \quad (4)$$

On the asset side, intra-Luxembourg positions (IL_A) represent the value of a CFI's equity in and net loans to resident companies excluding targets. Hence:

$$IL\_A_t = \sum_{i=1}^{N} DI\_A_{i,t}^{CTP=resident\ intermediary} \quad (5)$$

Thus on the asset side, intra-Luxembourg positions exclude direct investment in targets located in Luxembourg. Indeed, the paper disentangles intra-Luxembourg investment positions between resident CFIs within the holding and acquisition structure from direct investment positions ultimately invested in a final target located in Luxembourg. The paper classifies the latter positions as inward FDI if the target is ultimately owned by a non-resident, or as domestic direct investment (*DDI_A*) if the target is ultimately controlled by a resident.

Intra-Luxembourg positions may include pass-through funds (or funds in transit).[11] The latter can be defined as funds that pass through an enterprise resident in an economy to an affiliate in another economy, so that the funds do not stay in the economy of that enterprise. These funds are often associated with direct investment. Special purpose entities (SPEs), holding companies, and financial institutions that serve other non-financial affiliates are particularly associated with funds in transit, but other enterprises may also have pass-through funds in direct investment flows. As argued in the literature (*e.g.* IMF (2009), Blanchard and Alcalin (2016), Borga and Caliandro (2018), Di Nino (2019)), identifying pass-through funds is important to understand FDI dynamics, especially for economies hosting a financial centre.[12]

[11] See IMF (2009) Paragraphs 6.33 and 6.34 pp. 105-106.

[12] This paper does not identify pass-through funds in the strict sense, within intra-Luxembourg positions. Indeed, additional information and criteria (notably the number of employees at the CFI level) are required to identify pass-through funds *per se* within intra-Luxembourg positions (see *e.g.* Borga and Caliandro (2018), IMF (2018) and IMF (2020)).

2.4 Foreign direct investment

Inward FDI positions represent the value of non-residents' direct investment in resident entities. Outward FDI positions represent the value of residents' direct investment in non-resident entities. Direct investment positions include real estate as non-financial assets, equity as direct investment and debt as direct investment (see section 2.1). To be considered as foreign direct investment, the direct investor must have control or a significant degree of influence on the management of a direct investment entity that is resident in another economy. [13]

Outward FDI (*FDI_A*) can thus be defined as the direct investment asset position (*DI_A*) of a resident CFI *vis-à-vis* a *non-resident entity*. Hence:

$$FDI\_A_t = \sum_{i=1}^{N} DI\_A_{i,t}^{CTP=\,non-resident\ entity} \tag{6}$$

Given that investment funds generally use a holding and acquisition structure to acquire their targets, the *non-resident entity* can feature a non-resident target or any non-resident intermediaries (mostly CFIs) that ultimately own a non-resident target.

The fact that investment funds generally use a holding and acquisition structure to acquire their targets has several implications for the definition of inward FDI and its non-resident counterpart. Indeed, inward FDI (*FDI_L*) can entail two components.

The first component (FDI_L_1) features inward FDI as the direct investment liability position (*DI_L*) of a resident CFI *vis-à-vis* a *non-resident entity*. Hence:

$$FDI\_L_{1,t} = \sum_{i=1}^{N} DI\_L_{i,t}^{CTP=\,non-resident\ entity} \tag{7a}$$

Given that investment funds generally use a holding and acquisition structure to acquire their targets, the *non-resident entity* can feature a non-resident ultimate owner or any non-resident intermediaries (mostly CFIs) that are ultimately owned by a non-resident.

[13] See OECD (2008) and IMF (2009) Paragraph 6.8 pp.100-101, Paragraph 6.11 p. 101 and Paragraph 6.12 p. 101.

The second component (FDI_L_2) features inward FDI in resident targets located at the end of the ownership chain[14] and ultimately owned by a non-resident. This second component thus represents the actual amount of FDI that is ultimately invested in resident targets. Hence:

$$FDI\_L_{2,t} = \sum_{i=1}^{N} DI_{A_{i,t}}^{CTP=\,resident\ target\ ultimately\ owned\ by\ a\ non-resident} \qquad (7b)$$

Table 1 lists the various components of direct investment positions, for a given resident CFI. On both the asset and liability sides, each direct investment position can feature a resident or a non-resident counterpart. In addition, on the liability side, the investor counterpart can involve an ultimate owner or an intermediary. The latter should include mostly CFIs. On the asset side, the recipient counterpart can involve an ultimate target or an intermediary. The latter should include mostly CFIs that ultimately own a target.

Table 1: Measurement of direct investment positions at CFI-level

<table>
<tr><th rowspan="2">Position type</th><th rowspan="2" colspan="2">Counterpart</th><th colspan="2">Resident CFI</th><th rowspan="2" colspan="2">Counterpart</th><th rowspan="2">Position type</th></tr>
<tr><th>DI_L</th><th>DI_A</th></tr>
<tr><td rowspan="2">DDI_L</td><td rowspan="2">Ultimate owner</td><td rowspan="3">Resident</td><td rowspan="5">E_DI_L
+
D_DI_L</td><td rowspan="5">NFA^{RE}
+
E_DI_A
+
D_DI_A</td><td rowspan="3">Resident</td><td rowspan="2">Ultimate target</td><td>DDI_A
if target ultimately owned by a resident</td></tr>
<tr><td>FDI_L2
if target ultimately owned by a non-resident</td></tr>
<tr><td>IL_L</td><td>Intermediary</td><td>Intermediary</td><td>IL_A</td></tr>
<tr><td rowspan="2">FDI_L1</td><td>Ultimate owner</td><td rowspan="2">Non-resident</td><td rowspan="2">Non-resident</td><td>Ultimate target</td><td rowspan="2">FDI_A</td></tr>
<tr><td>Intermediary</td><td>Intermediary</td></tr>
</table>

[14] On the asset side of a given CFI (hence, *DI_A*), given the use of holding and acquisition structures by investment funds to acquire their targets.

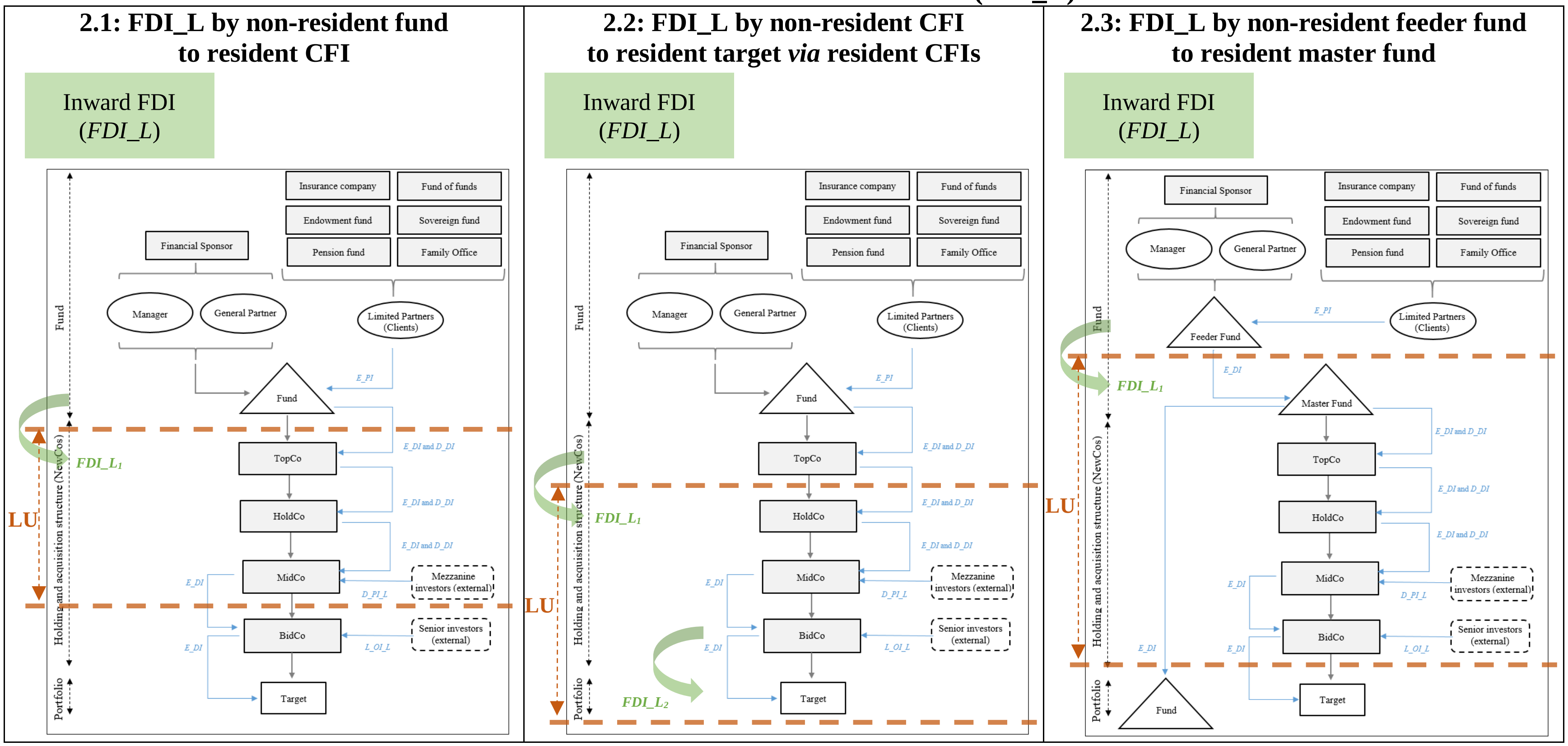
2.5 Examples

2.5.1 Possible cases for inward FDI

Table 2 illustrates different cases for direct investment positions to be considered as inward FDI (*FDI_L*).[15] Inward FDI can originate from a non-resident fund (cases 2.1 and 2.3 in Table 2) or a non-resident CFI owned by a non-resident fund (2.2). The destination of inward FDI may be a resident CFI that ultimately owns a non-resident target (2.1), a resident CFI that ultimately owns a resident target (2.2), a resident target indirectly owned by a non-resident fund (2.2)[16], or a resident fund that ultimately owns a non-resident target (2.3). In the latter case, statistical standards[17] consider that investment funds may be direct investors or direct investment enterprises. A "fund of funds" is an investment fund that invests in other investment funds and thus may become a direct investor in one of the funds. In a master-feeder fund arrangement, one or more investment funds (feeder funds) pool their portfolio in another fund (the master fund). In this case, a feeder fund that has 10 percent or more of the voting power in the master fund would meet the definition of a direct investment relationships for a direct investor. Similarly, retail funds that hold 10 percent or more of voting power in an enterprise are direct investors.

[15] The paper provides a few examples and does not list all the possible cases.
[16] This corresponds to FDI_L_2 in section 2.4.
[17] See IMF (2009) Paragraph 6.30 p. 105.

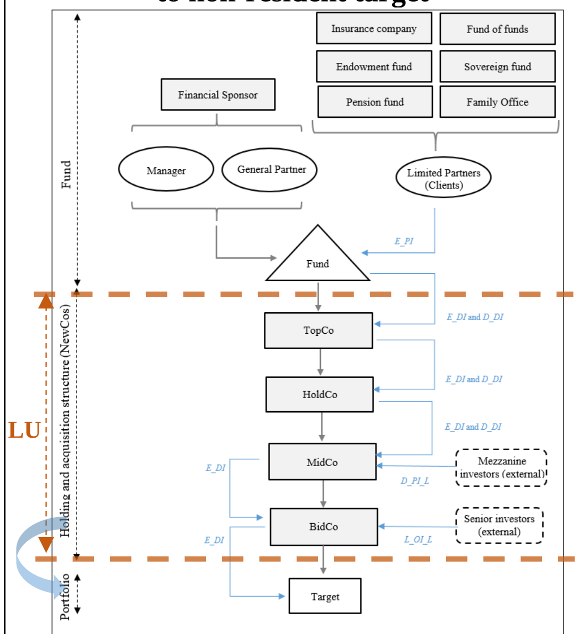
Table 2: Possible cases for inward FDI (*FDI_L*)



NB: The charts represent a stylised structure of a private equity investment fund. Source: adapted from Hudson (2014) and Gilligan and Wright (2020).

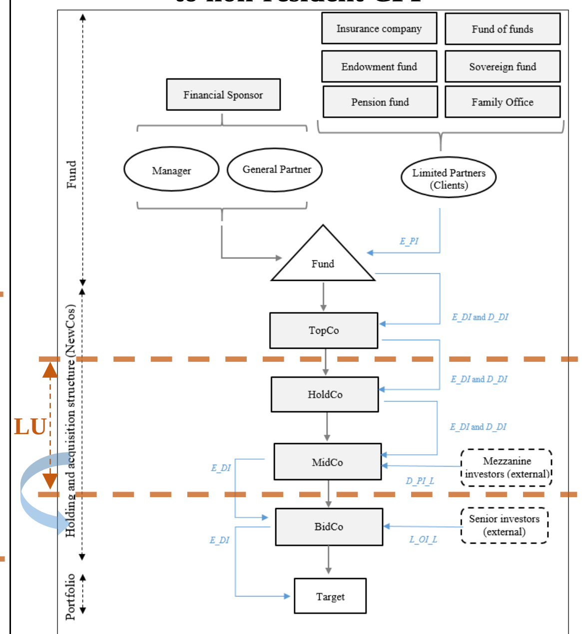
Table 3: Possible cases for outward FDI (*FDI_A*)

3.1: FDI_A by resident CFI to non-resident target



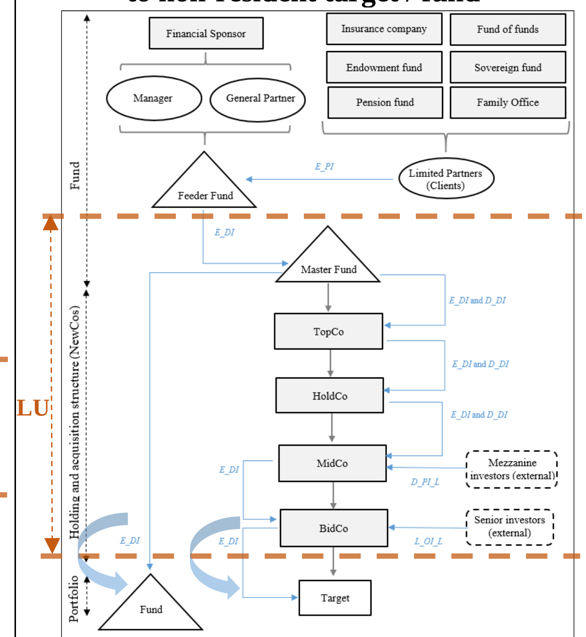
Outward FDI
(*FDI_A*)

3.2: FDI_A by resident CFI to non-resident CFI



Outward FDI
(*FDI_A*)

3.3: FDI_A by resident CFI / master fund to non-resident target / fund



Outward FDI
(*FDI_A*)

NB: The charts represent a stylised structure of a private equity investment fund. Source: adapted from Hudson (2014) and Gilligan and Wright (2020).

2.5.2 Possible cases for outward FDI

Table 3 illustrates different cases for investment positions to be considered as outward FDI (*FDI_A*).[18] Outward FDI can be initiated by a resident CFI (cases 3.1, 3.2 and 3.3 in Table 3) or a resident fund (3.3). The destination of outward FDI may be a non-resident target (3.1, 3.3), a non-resident CFI (3.2) or a non-resident fund (3.3).

2.5.3 Measurement of investment positions at CFI-level

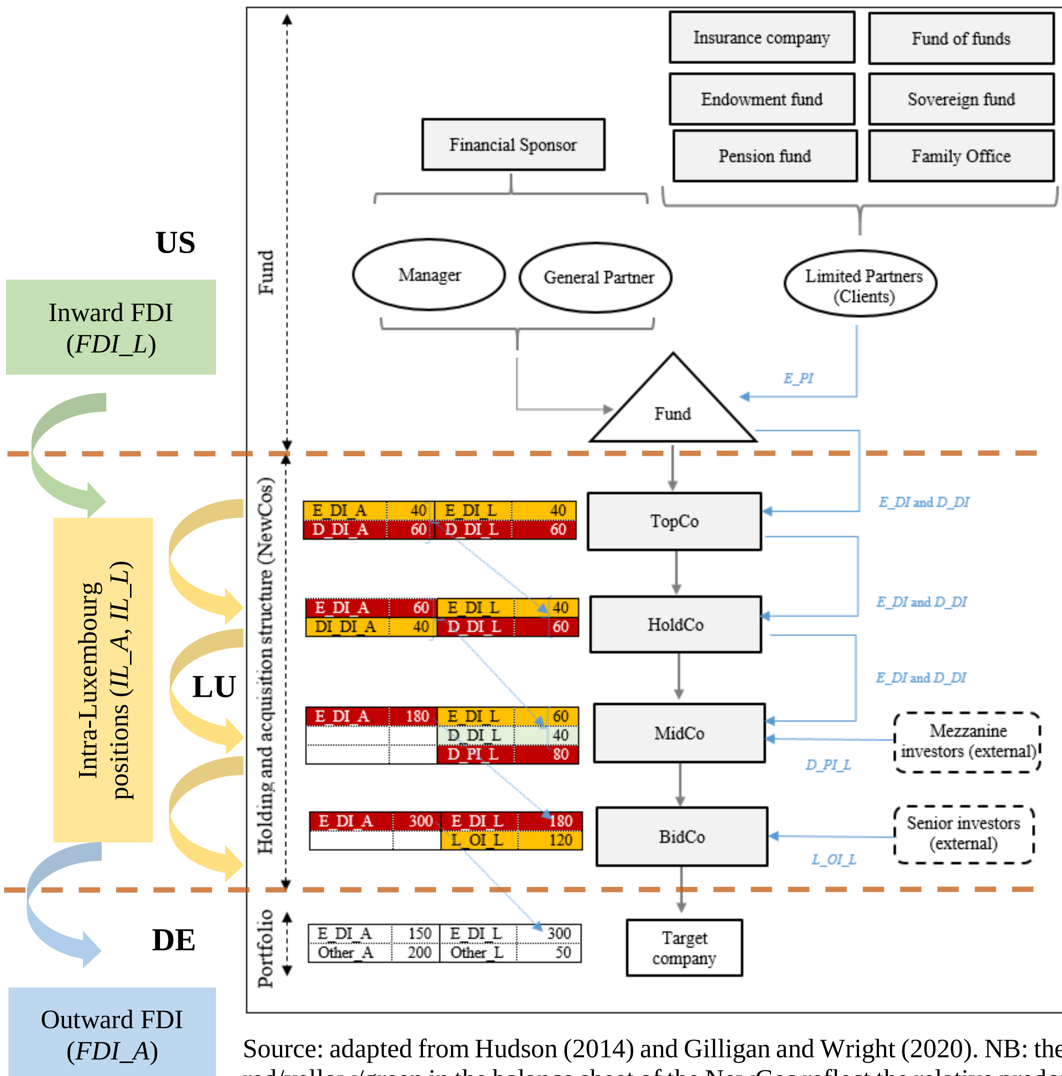
The stylised examples below illustrate the measurement of different types of direct investment positions, mainly inward FDI (*FDI_L*), outward FDI (*FDI_A*) and intra-Luxembourg positions (*IL_L*, *IL_A*).

For private equity investment funds (Diagram 1), assume an investment from the US in a private company located in Germany *via* a holding and acquisition structure located in Luxembourg. Overall, the positions amount to 100 for inward FDI from US to LU (*FDI_L*), 300 for outward FDI from LU to DE (*FDI_A*), and 380 for intra-Luxembourg direct investment positions (*IL_A*, *IL_L*) on both the asset and liability sides. The difference between inward and outward FDI corresponds to external financing including debt securities as portfolio investment (*D_PI_L*=80) and loans as other investment (*L_OI_L*=120).

For real estate investment funds (Diagram 2), assume an investment from the UK in a real estate property located in Italy *via* a holding and acquisition structure located in Luxembourg. Overall, the positions amount to 50 for inward FDI from UK to LU (*FDI_L*), 160 for outward FDI from LU to IT (*FDI_A*), and 190 for intra-Luxembourg direct investment positions (*IL_A*, *IL_L*) on both the asset and liability sides. The difference between inward and outward FDI is covered by external financing in the form of debt securities as portfolio investment (*D_PI_L*=40) and loans as other investment (*L_OI_L*=80).

[18] The paper provides a few examples and does not list all the possible cases.

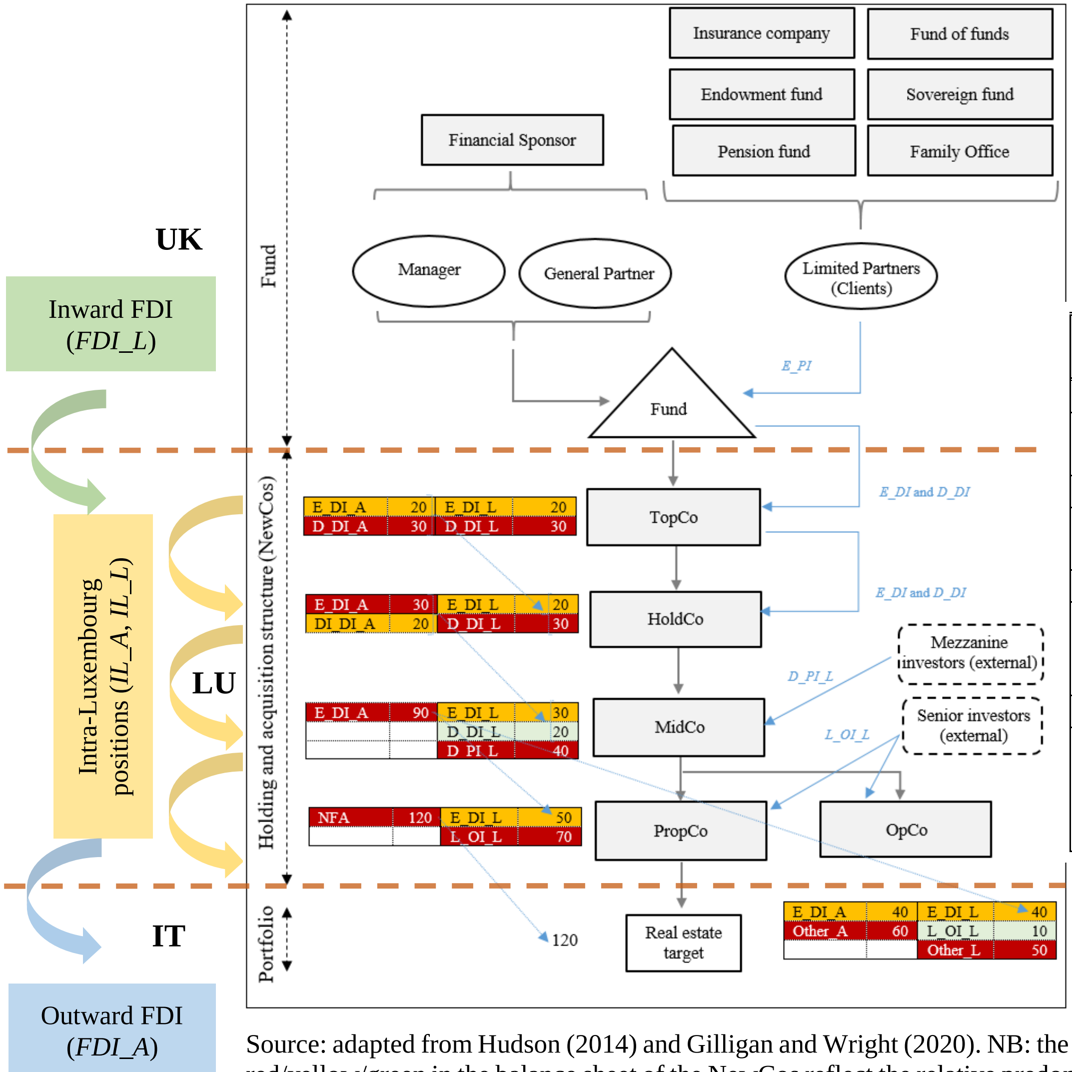
Diagram 1: Stylised structure of a private equity investment fund



Position type	Measurement of investment positions at CFI-level		Position type
	TopCo		
IL_A	$E\_DI\_A^{TopCo}+D\_DI\_A^{TopCo}$ = 40 + 60 = 100	$E\_DI\_L^{TopCo}+D\_DI\_L^{TopCo}$ = 40 + 60 = 100	*FDI_L*
	HoldCo		
IL_A	$E\_DI\_A^{HoldCo}+D\_DI\_A^{HoldCo}$ = 60 + 40 = 100	$E\_DI\_L^{HoldCo}+D\_DI\_L^{HoldCo}$ = 40 + 60 = 100	*IL_L*
	MidCo		
IL_A	$E\_DI\_A^{MidCo}$ = 180	$E\_DI\_L^{MidCo}+D\_DI\_L^{MidCo}$ = 60 + 40 = 100 $D\_PI\_L^{MidCo}$ = 80	*IL_L* *D_PI_L*
	BidCo		
FDI_A	$E\_DI\_A^{BidCo}$ = 300	$E\_DI\_L^{BidCo}$ = 180 $L\_OI\_L^{BidCo}$ = 120	*IL_L* *L_OI_L*

Source: adapted from Hudson (2014) and Gilligan and Wright (2020). NB: the colours red/yellow/green in the balance sheet of the NewCos reflect the relative predominance of their respective balance sheet items and thus the type of CFI (for more information, see Di Filippo and Pierret (2020a, 2022)).

Diagram 2: Stylised structure of a real estate investment fund



Position type	Measurement of investment positions at CFI-level		Position type
	TopCo		
IL_A	$E\_DI\_A^{TopCo}+D\_DI\_A^{TopCo}$ = 20 + 30 = 50	$E\_DI\_L^{TopCo}+D\_DI\_L^{TopCo}$ = 20 + 30 = 50	*FDI_L*
	HoldCo		
IL_A	$E\_DI\_A^{HoldCo}+D\_DI\_A^{HoldCo}$ = 30 + 20 = 50	$E\_DI\_L^{HoldCo}+D\_DI\_L^{HoldCo}$ = 20 + 30 = 50	*IL_L*
	MidCo		
IL_A	$E\_DI\_A^{MidCo}$ = 90	$E\_DI\_L^{MidCo}+D\_DI\_L^{MidCo}$ = 30 + 20 = 50 $D\_PI\_L^{MidCo}$ = 40	*IL_L* *D_PI_L*
	PropCo and OpCo		
FDI_A	$NFA^{PropCo}+E\_DI\_A^{OpCo}$ = 120 + 40 = 160	$E\_DI\_L^{PropCo} + E\_DI\_L^{OpCo}$ = 50 + 40 = 90 $L\_OI\_L^{PropCo} + L\_OI\_L^{OpCo}$ = 70 + 10 = 80	*IL_L* *L_OI_L*

Source: adapted from Hudson (2014) and Gilligan and Wright (2020). NB: the colours red/yellow/green in the balance sheet of the NewCos reflect the relative predominance of their respective balance sheet items and thus the type of CFI (for more information, see Di Filippo and Pierret (2020a, 2022)).

3. Data

3.1 Set of CFIs and balance sheet data

This paper uses the new database developed by Di Filippo and Pierret (2022), which enhances the data coverage of CFIs in Luxembourg by including CFIs with less than 500 million euros in total assets that are not required to report to the BCL. The new database is thus more comprehensive than that used in Di Filippo (2023), which was limited to CFIs covered by the BCL reporting framework.

The new database combines information from three sources: the EuroGroups Register (EGR) managed by Eurostat[19], the Statistical Business Register (SBR) managed by STATEC (the National Statistical Institute of Luxembourg) and the Central Balance Sheet Register (CBSR) also managed by STATEC. Data are available at annual frequency over the period 2011-2021.

CFIs resident in Luxembourg are identified by the NACE codes reported in the past to the EGR, complemented by the current NACE codes reported in the SBR.[20] In accordance with statistical standards, the set of CFIs includes resident companies that fall under NACE codes 64.20 ("activities of holding companies") and 64.305 ("wealth management companies" or *société de gestion de patrimoine familial*).

The construction of CFI balance sheets relies on accounting data from the standardised chart of accounts, available in electronic format in the Central Balance Sheet Register. This register retrieves information from the annual financial accounts that resident companies must transmit to the electronic platform of the National Business Register.

Starting from the chart of accounts, we implement a matching procedure between accounting items to get the simplified balance sheet associated with each CFI (Table 4). [21]

[19] For more information, see Bikauskaite *et al*. (2019).
[20] The NACE (Nomenclature of Economic Activities) is the European statistical classification of economic activities (Eurostat (2013)). Statistics produced on the basis of NACE codes are comparable at the European level and, in general, at the world level, in line with the United Nations (2008)'s International Standard Industrial Classification (ISIC).
[21] The matching procedure of balance sheet items between the chart of accounts, the balance sheet, and the simplified balance sheet is available in Di Filippo and Pierret (2022).

Table 4: Simplified balance sheet of CFIs

Balance sheet items		Assets	Liabilities
Non-financial assets		*NFA*	
Direct investment	Equity	*E_DI_A*	*E_DI_L*
	Debt	*D_DI_A*	*D_DI_L*
Portfolio investment	Equity	*E_PI_A*	*E_PI_L*
	Debt	*D_PI_A*	*D_PI_L*
Other investment	Loans	*L_OI_A*	*L_OI_L*
	Currency and deposits	*CD_OI_A*	
Financial derivatives		*Deriv_A*	*Deriv_L*
Short sales			*SS_L*
Other liabilities			*Other_L*

Source: Di Filippo and Pierret (2020a, 2022), adapted from IMF (2018)

The simplified balance sheet considers various items. The assets side includes non-financial assets (*NFA*), equity and debt as direct investment (*E_DI_A* and *D_DI_A*, respectively) or as portfolio investment (*E_PI_A* and *D_PI_A*, respectively), loans as other investments (*L_OI_A*), currency and deposits (*CD_OI_A*) and financial derivatives (*Deriv_A*).

The liabilities side covers equity and debt as direct investment (*E_DI_L* and *D_DI_L*, respectively) or as portfolio investment (*E_PI_L* and *D_PI_L*, respectively), loans as other investments (*L_OI_L*), financial derivatives (*Deriv_L*), short sales (*SS_L*) and other liabilities (*Other_L*).

Overall, the NACE code and the availability of accounting data in the chart of accounts provided by the CBSR determine the set of CFIs analysed in this paper.

3.2 Group affiliation

In line with statistical standards (OECD (2008)), the affiliation of CFIs to their respective group (or parent) involves climbing up the ownership chain of the immediate direct investor until the parent is reached. The parent is the ultimate controlling investor (UCI) or a unit that is not controlled by any other unit.[22]

Following Di Filippo and Pierret (2020b) and Di Filippo (2022) the procedure relies exclusively on public information from the National Business Register, including CFI shareholders and the annual financial accounts. Additional publicly available sources may also be necessary,

[22] For more information, see OECD (2008) p. 113, Borga and Caliandro (2018) p. 8.

such as the EDGAR database managed by the US Securities and Exchange Commission or other data sources (*e.g.* Bloomberg).[23]

For investment funds, the parent is the sponsor of the fund (or fund initiator or fund promoter), who is the person, group of persons or institution taking the initiative to set up an investment fund and determining its terms and conditions.[24] The fund sponsor can be considered the capital manager, who allocates capital provided by the Limited Partners (LPs).[25]

The database also identifies the residence of the sponsors, meaning the country of their operational headquarters.

In the database, sponsors are mainly capital managers using resident CFIs to invest funds provided by LPs in private equity or real estate. Sponsors can include investment firms focused on private equity or real estate. Sponsors can also include investment management firms affiliated to investment banks, universal banks or insurance groups, as well as pension funds and sovereign wealth funds that use resident CFIs to invest in private companies or real estate.

This paper assumes that the investment fund sponsor is the ultimate controlling investor of the target, and hence the ultimate owner of the target.

3.3 Target identification

Identifying the target requires climbing down the ownership chain using publicly available information, mostly CFIs' annual financial accounts in the National Business Register. Given that investment funds' holding and acquisition structures often feature several entities, this involves using the CFI's annual financial accounts to identify affiliates in the items "*Shares in affiliated undertakings*" and "*Loans to affiliated undertakings*".[26] This provides a step down the ownership chain, a process that can continue until reaching the last CFI that ultimately owns the target.

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[23] Appendix A presents the coverage rate of CFIs affiliated to a parent group in the new database based on EGR-SBR-CBSR.

[24] The sponsor generally comprises a General Partner (GP) and a management company. The GP is the entity with the legal authority to make decisions for the fund. This entity also assumes all legal liability. The management company (or fund manager or investment advisor) is the operating entity that allocates capital and manages investments.

[25] The Limited Partners (LPs) are the main investors of the fund and may be institutional investors, including pension funds, investment funds, endowment funds, insurance companies, investment banks, family offices and funds of funds.

[26] Indeed, the measurement of FDI includes notably the holding of cross-border participations in affiliates, provided that the participation is larger than 10% of the capital share of the affiliate (item "*Shares in affiliated undertakings*") and cross-border intra-group loans or intercompany debt in a group (item "*Loans to affiliated undertakings*"). For more information, see Patterson *et al*. (2004) and IMF (2009).

In addition to the annual financial accounts, information is also drawn from websites set up by investment fund sponsors. The latter often disclose fund acquisitions along with their main characteristics: purchase date, purchase price, main economic activities undertaken by the target, geographical location of the target (or headquarters), main objectives of the investment, main achievements accomplished by the target, *etc*. In addition to the above sources, information is also drawn from publicly available financial literature (*e.g.* Reuters, Bloomberg, the Wall Street Journal, the Financial Times, and specialised journals/websites dealing with private equity or real estate investment), as well as publications by Competition and Market Authorities.[27]

The paper also identifies the residence of the target. When sponsors invest in complex structures such as multinational corporations, the country of the operational headquarters is used to assign a residence to the target. When sponsors invest in targets featuring simple structures, the residence of the target is the country of the final investment. This is notably the case for real estate investments (*e.g.* residential lots, office towers, shopping centres, *etc.*) or infrastructure investments (*e.g.* telecommunication framework, transportation infrastructure, solar plants, wind farms, *etc.*). Information is also collected on the main economic activities performed by the targets to better understand how sponsors allocate their investments across business activities.[28]

3.4 Immediate counterpart country *versus* country of sponsor/target counterpart

This paper uses the immediate counterpart country to disentangle intra-Luxembourg investment positions from FDI positions (both inward and outward) and domestic direct investment positions.

The National Business Register provides information on immediate counterpart country for resident CFIs. This will indicate direct shareholders in resident companies along with their country of residence. However, this information is only available for limited liability companies (*Société à responsabilité limitée* or *S.à r.l.*) and limited partnerships (*Société en commandite simple* or *S.C.S.*). It is not available for public limited companies (*Société anonyme* or *S.A.*), simplified shareholder companies (*Société par actions simplifiée* or *S.A.S*), partnerships limited by shares

[27] For more information, see Di Filippo (2023).

[28] Appendix B presents the coverage rate of identified targets for CFIs affiliated to investment funds focusing on private equity or real estate.

(*Société en Commandite par Actions* or *S.C.A.*) and European companies (*Société européenne* or *S.E.*).[29]

Fortunately, SARL companies represent the most important category among CFIs affiliated to investment funds that focus on private equity or real estate. Over the period 2011-2021, SARL companies accounted for 93% of the total number of CFIs considered. More precisely, SARL companies accounted for 86% of the CFIs' direct investment position on the asset side and 84% on the liability side. SCS companies account for only 1% of CFIs' direct investment position on both the asset and liability sides. Overall, the National Business Register can serve to identify the immediate counterpart country for 87% of resident CFIs' direct investment position on the asset side and 85% on the liability side.

On the liability side of CFIs' direct investment positions, the paper uses the sponsor's country of residence when the immediate counterpart country is missing (notably for *S.A.*, *S.A.S.*, *S.C.A.* and *S.E.*) or when the immediate counterpart is a non-resident CFI ultimately controlled by a sponsor resident in another country.[30] In the latter case, the residence of the sponsor seems more useful than that of the immediate counterpart to identify the country of the ultimate controlling investor, in this case, the fund sponsor.[31]

On the asset side of CFIs' direct investment positions, the paper uses the target's country of residence when the immediate counterpart is a non-resident CFI that ultimately owns a target. Based on stylised facts observed in the database, this assumption is useful for at least two reasons. First, many investment funds use a chain of CFIs in Luxembourg to hold a target that is generally located in a foreign country. Second, other investment funds use a chain of CFIs combining some in Luxembourg and some in the country of the target. In both cases, the immediate non-resident counterpart country corresponds to the country of the target. Third, if an investment fund uses a

[29] Appendix C presents the respective shares of these various types of companies (*S.à r.l, S.C.S.*, *S.A.*, *S.A.S.*, *S.C.A.* and *S.E.*) in the set of CFIs in Luxembourg affiliated to investment funds focusing on private equity or real estate.

[30] For example, if a US investment fund invests in a CFI in Luxembourg *via* a CFI located in the Cayman Islands (immediate counterpart country), then the paper uses the US counterpart *i.e.* the country of the sponsor. Indeed, the latter counterpart is more useful to identify the country of the ultimate controlling investor rather than a country hosting intermediate entities (CFIs) within the ownership chain.

[31] Several papers consider mapping FDI based on the residence of the parent (or ultimate owner) as more useful than the immediate counterpart country traditionally used by international statistical standards. See for example Borga and Caliandro (2018), Gómez-Llabrés *et al*. (2022) and Di Filippo (2023).

chain of CFIs including some in Luxembourg and some in countries other than the target country, then the country of the target would still be more relevant than the country of the immediate counterpart.[32]

Considering the immediate counterpart country in addition to the country of the sponsor and of the target makes it possible to build a hierarchical chain of ownership by identifying the owner(s) of a given CFI on its liability side and the affiliates (*i.e.* CFIs, targets or both) on its asset side.

Hence, a CFI would be upstream in the ownership chain if its liability counterpart is the sponsor and its asset counterpart is a CFI resident in Luxembourg. It would be in the middle of the ownership chain if both its liability and asset counterparts are CFIs in Luxembourg. It would be downstream in the ownership chain if its liability counterpart is a resident CFI and its asset counterpart is a target.

Given the complexity of ownership chains, a given CFI could also feature a mixture of the above scenarios. For example, if a CFI owns both a resident CFI and a target, then the CFI's direct investment position is decomposed according to the respective counterparts. A similar reasoning applies to the liability side.

3.5 Valuation of direct investment positions

This paper computes direct investment positions based on accounting data from the standardised chart of accounts, available in electronic format in the Central Balance Sheet Register. The latter generally provides valuation of accounting items at book value.[33] Book value is the historical value of an asset based on a company's balance sheet. It is determined as the cost paid for acquiring an asset (purchase price or cost price) minus any depreciation, amortisation, or impairment costs applicable to the asset. The concept of book value arises from the practice of

[32] For instance, if a CFI in Luxembourg ultimately owns a target in Germany *via* a CFI located in the Netherlands (immediate counterpart country), then the paper uses the German counterpart *i.e.* the country of the target. Indeed, the latter counterpart is more useful to identify the country of the final recipient of FDI rather than a country hosting intermediate entities (CFIs) within the ownership chain.

[33] See https://guichet.public.lu/en/entreprises/gestion-juridique-comptabilite/comptable/enregistrement/methodes-etablissement-comptes-annuels.html

recording the assets on the balance sheet at its historical cost. The latter considers the original cost of the asset, at the time and date of its acquisition.

The literature recognises several limitations concerning the valuation of an asset at book value. According to ECB (2013), the book value can produce inconsistent results in data and biases in estimates of the FDI position. These problems can be more prominent for countries that host many holding companies, such as Luxembourg.[34] In addition, over long periods of time, FDI positions valued at book value can suffer from discrepancies between original book value and market value, as the value of assets changes over time, rendering the inter-temporal comparison of FDI positions problematic (Ihrig and Marquez (2006), Contessi and Weinberger (2009), Dellis *et al*. (2017)).

A potential solution would be to adjust FDI positions to their current market value. This involves updating assets to the value at which they can be currently sold on the market. As a minimum, the literature recommends adjusting the value of direct investment positions for inflation and changes in exchange rates (current costs, as in Ihrig and Marquez (2006), Contessi and Weinberger (2009)), although others recommend using market value for all direct investment positions (OECD (2008), IMF (2009)). Assuming market conditions are normal, market value would provide a more reasonable and unbiased estimate of the intrinsic value of an asset. However, while adjustment to market value can be relatively straightforward for companies with equity securities regularly traded on financial markets, it becomes challenging for unlisted assets, such as private equity or real estate. In this case, market values cannot be directly observed and can only be estimated. International institutions have provided a short list of acceptable approaches for the valuation of unlisted equity (OECD (2008), IMF (2009), IMF (2021)). Some studies in the literature have attempted to apply them (see for example, Boulay and Simard (2006), Kronholm (2013)). Applying these approaches to the Luxembourg FDI position, and in particular to the granular database used in this study, is challenging and goes beyond the scope of this paper. In addition, international standards have not yet agreed on a reliable and harmonised estimation method that could lead to cross-country comparable asset valuation of unlisted assets. Despite the recommendations by IMF and OECD, and given the difficulty to find the most robust valuation method, the current practice in most countries regarding the unlisted direct investment equity is to

[34] For more information, see ECB (2013).

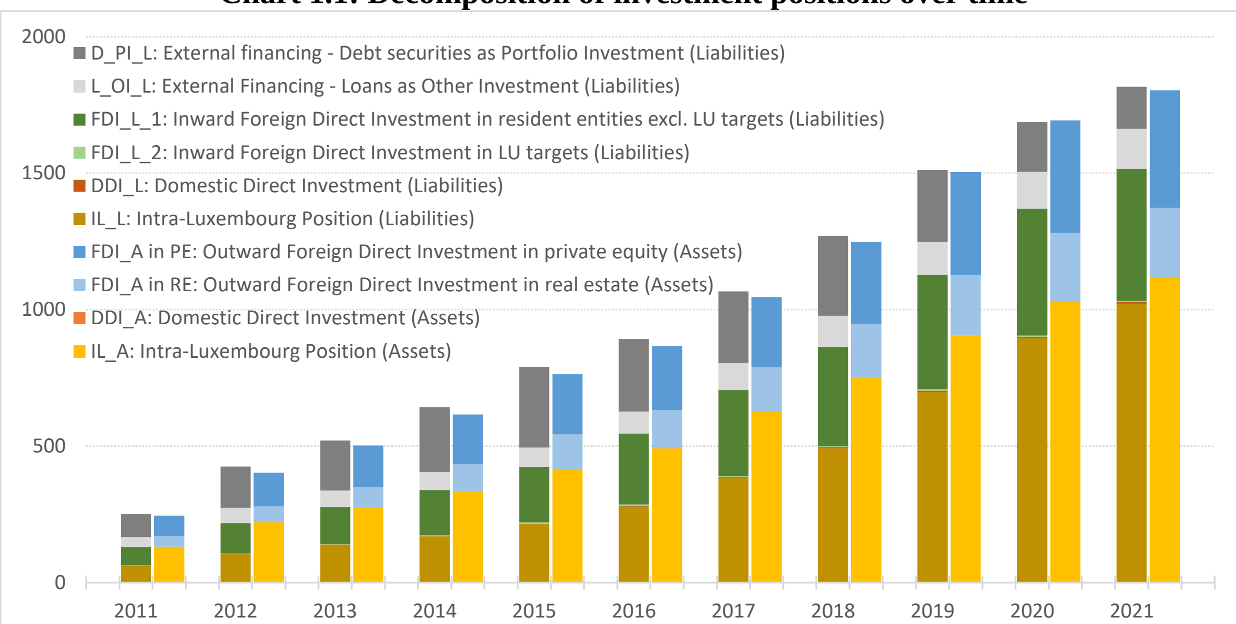
value it by relying on the book value.[35] As a result, this paper values direct investment positions at book value, accepting its limitations.

4. Decomposition of direct investment positions

4.1 Decomposition of direct investment positions over time

Chart 1.1 presents the investment positions of resident CFIs affiliated to investment funds focused on private equity or real estate over 2011-2021. Investment positions include external financing positions (*L_OI_L*, *D_PI_L*) and direct investment positions. The latter are decomposed into FDI positions (*FDI_L*, *FDI_A*), intra-Luxembourg positions (*IL_L*, *IL_A*) and domestic direct investment positions (*DDI_L*, *DDI_A*).

Chart 1.1: Decomposition of investment positions over time



Unit: Billions of euros

For direct investment, the liability positions *IL_L* + *DDI_L* + *FDI_L* are always lower than the asset positions *IL_A* + *DDI_A* + *FDI_A*. The difference is compensated by external financing, whether in the form of debt securities as portfolio investment (*D_PI_L*) or loans as other

[35] See Kronholm (2013) and IMF (2021).

investment (*L_OI_L*). The use of debt as securities or as loans by investment funds, in addition to equity, provides financial leverage to increase the return on investments.

In 2021, the liability side includes about 56% of intra-Luxembourg positions (*IL_L*), 26% of inward FDI positions (*FDI_L*), 9% of external financing as portfolio investment in debt securities (*D_PI_L*), 8% of external financing as other investment in loans (*L_OI_L*) and less than 1% of domestic direct investment (*DDI_L*). About 99% of the inward FDI position is made up of FDI in resident entities other than targets.[36] The remaining 1% is the actual FDI position in resident targets.[37]

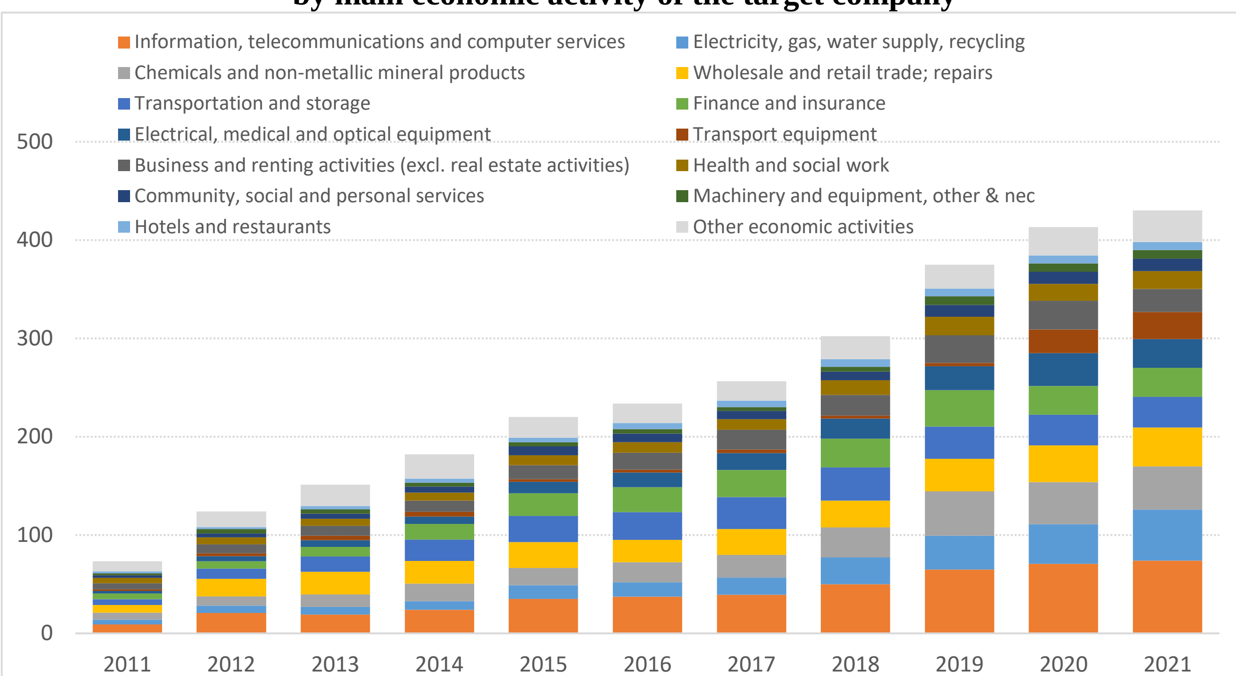
The asset side includes about 62% of intra-Luxembourg positions (*IL_A*), 38% of outward FDI positions (*FDI_A*) and less than 1% of domestic direct investment positions (*DDI_A*). The outward FDI position consists of 65% of FDI in private equity and 35% of FDI in real estate.

[36] This corresponds to FDI_L_1 in section 2.4.
[37] This corresponds to FDI_L_2 in section 2.4.

4.2 Decomposition of outward FDI position in private equity by company activity

Chart 1.2 decomposes the outward FDI position in private equity by main economic activity of the target company. In 2021, "Information, telecommunications and computer services" have the largest share (17%), followed by "Electricity, gas, water supply, recycling" (12%), "Chemicals and non-metallic mineral products" (10%), "Wholesale and retail trade; repairs" (9%), "Transportation and storage" (7%), "Finance and insurance" (7%), "Electrical, medical and optical equipment" (7%), "Transport equipment" (6%), "Business and renting activities" (6%), and "Health and social work" (4%). Together, these activities account for about 85% of the outward FDI position.

Chart 1.2: Decomposition of outward FDI position in private equity (*FDI_A* in PE) by main economic activity of the target company

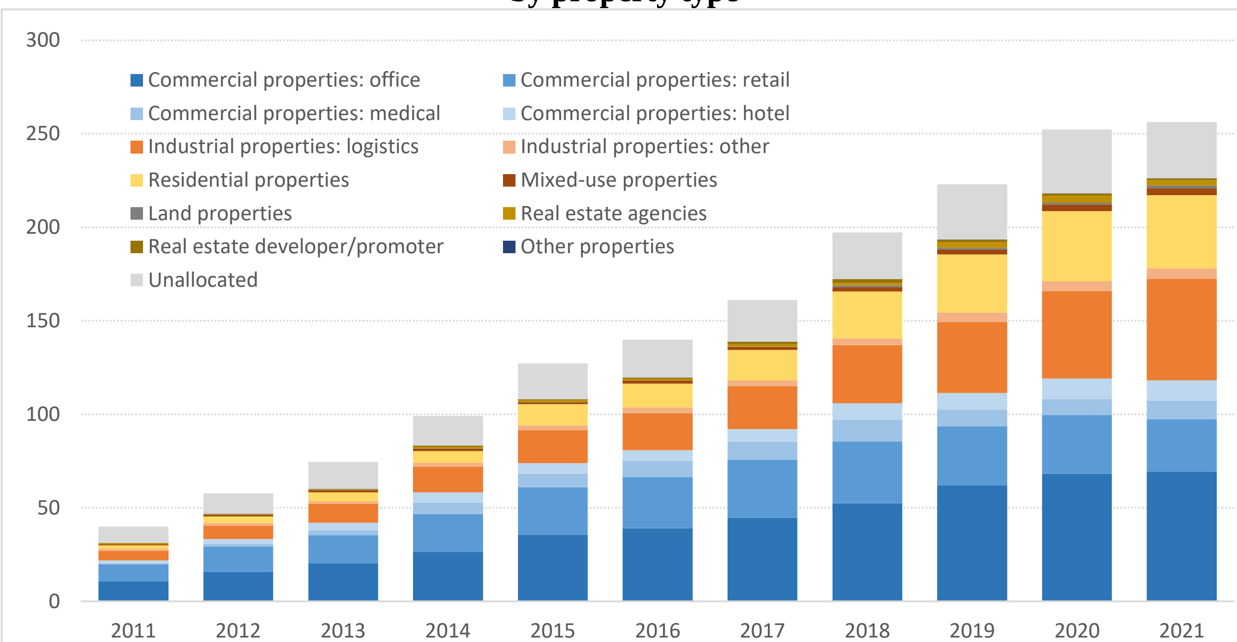


Unit: Billions of euros

4.3 Decomposition of outward FDI position in real estate by property type

Chart 1.3 decomposes the outward FDI position in real estate by property type. In 2021, commercial properties feature the largest share (45%) followed by industrial properties (24%) and residential properties (15%). The remainder represents other investments in real estate. Commercial properties are mostly office properties (60%) and retail properties (25%). Industrial properties are mostly logistics properties (90%).

Chart 1.3: Decomposition of outward FDI position in real estate (*FDI_A* in RE) by property type



Unit: Billions of euros

5. Decomposition of direct investment positions

5.1 Decomposition of direct investment positions by various counterparts

Chart 2.1 decomposes investment positions by various counterparts, mainly sponsors, targets, external finance providers and holding and acquisition structures. The chart distinguishes different types of investment positions, notably external financing positions (*L_OI_L*, *D_PI_L*) and direct investment positions. The latter are decomposed into FDI positions (*FDI_L*, *FDI_A*), intra-Luxembourg positions (*IL_L*, *IL_A*) and domestic direct investment positions (*DDI_L*, *DDI_A*).[38]

Compared to Di Filippo (2023), this chart provides a more comprehensive picture of the composition of direct investment positions by CFIs affiliated to investment funds focusing on private equity or real estate.[39] First, this paper also considers smaller CFIs with less than 500 million euros in total assets. Second, this paper addresses the issue of CFIs owning multiple targets.

On the liability side, resident CFIs composing the holding and acquisition structure source funds mostly as FDI from non-resident sponsors (FDI_L_1) and external financing, and to a lesser extent as domestic direct investment from resident sponsors (*DDI_L*). External investors finance the liability side of CFIs, in the form of debt securities as portfolio investment (*D_PI_L*) or loans as other investment (*L_OI_L*).

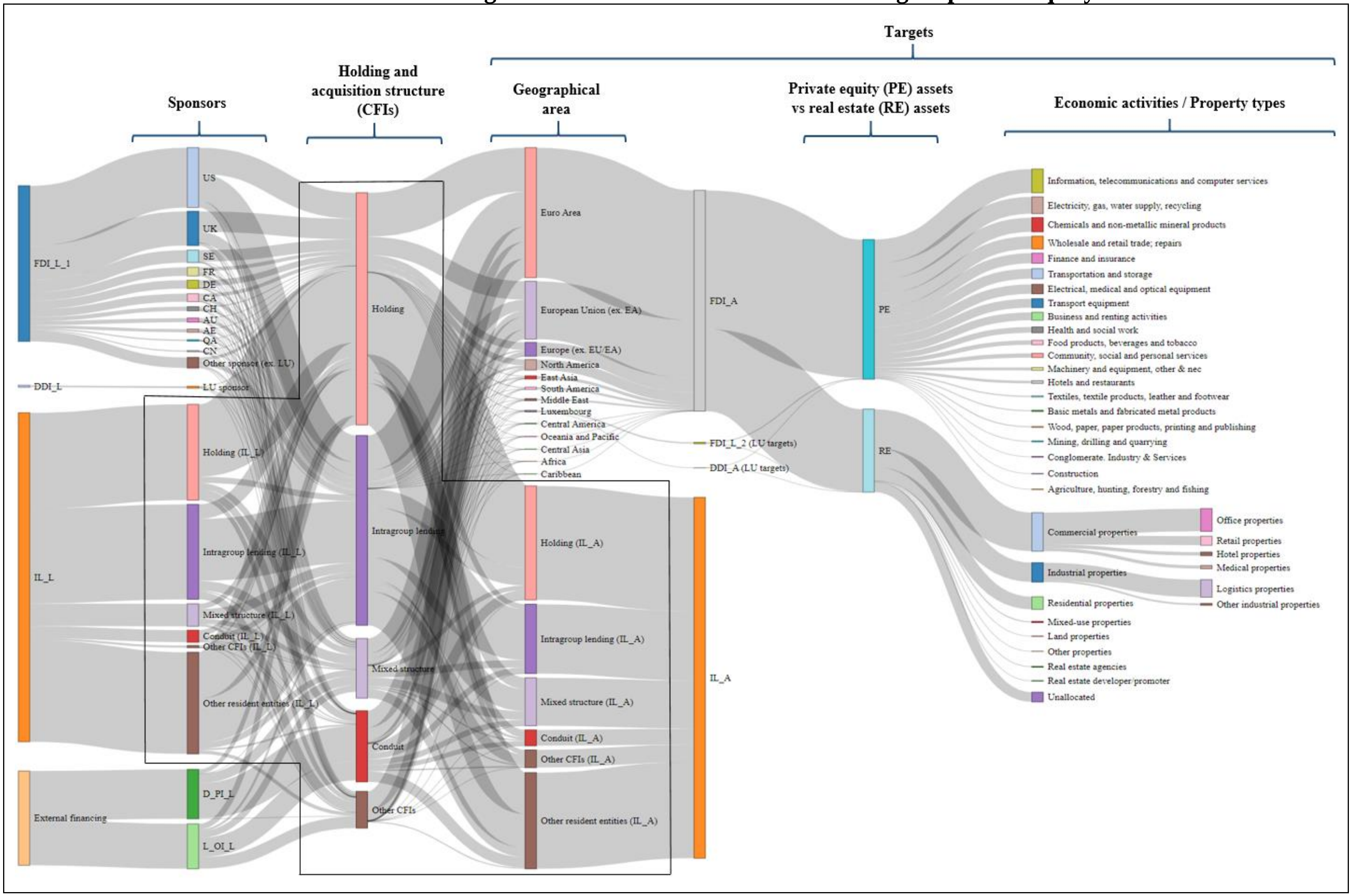
Most sponsors managing investment funds focusing on private equity or real estate are headquartered in the United States or the United Kingdom. These sponsors use CFIs resident in Luxembourg to structure their investments in the targets.

On the asset side, outward FDI (*FDI_A*) finances the acquisition of targets mostly located in Western Europe (especially the euro area) and to a lesser extent in North America (notably, the United States). Direct investments in targets located in Luxembourg initiated by resident sponsors (*DDI_A (LU targets)*) and non-resident sponsors (FDI_L_2 *(LU targets)*) account for a small share of total direct investment by investment funds.

[38] In Chart 2.1, "FDI_L_1" on the left-hand side represents FDI_L_1 in section 2.4, while "FDI_L_2 (LU targets)" below the "Targets" brace represents FDI_L_2 in section 2.4.

[39] However, this paper focuses only on the downstream part of the financing chain. Di Filippo (2023) also examined the upstream part of the financing chain by investigating the Limited Partners (or the client counterpart).

Chart 2.1: Decomposition of investment positions:
Evidence from CFIs in Luxembourg affiliated to investment funds focusing on private equity or real estate



Unit: Percent of total investment position in 2021. NB: PE (RE) stands for private equity assets (real estate assets).

Private equity accounts for about 65% of the outward FDI position, with the remaining 35% going to real estate.

Direct investment in private equity (*FDI_A*, *FDI_L_2*, *DDI_A* in PE) targets companies that are quite dispersed across economic activities: "Information, telecommunications and computer services", "Electricity, gas, water supply, recycling", "Chemicals and non-metallic mineral products", "Wholesale and retail trade; repairs", "Finance and insurance", "Transportation and storage", "Electrical, medical and optical equipment", "Transport equipment", "Business and renting activities", and "Health and social work".

Direct investment in real estate (*FDI_A*, *FDI_L_2*, *DDI_A* in RE) is more concentrated by property type, targeting mainly commercial buildings (office and retail properties), industrial buildings (in particular, logistics properties) and, to a lesser extent, residential properties.

Chart 2.1 illustrates the intra-Luxembourg investment positions linking CFIs with resident entities. The holding and acquisition structure mostly consists of holding companies, intragroup lending corporations, mixed structures and conduit companies.

Complex ownership chains can appear between resident entities on both the liability (*IL_L*) and asset (*IL_A*) sides.

The counterparts of resident CFIs are mostly resident CFIs that form the holding and acquisition structure. This suggests that investment funds use an ownership chain of intermediate entities in Luxembourg that features mostly CFIs.

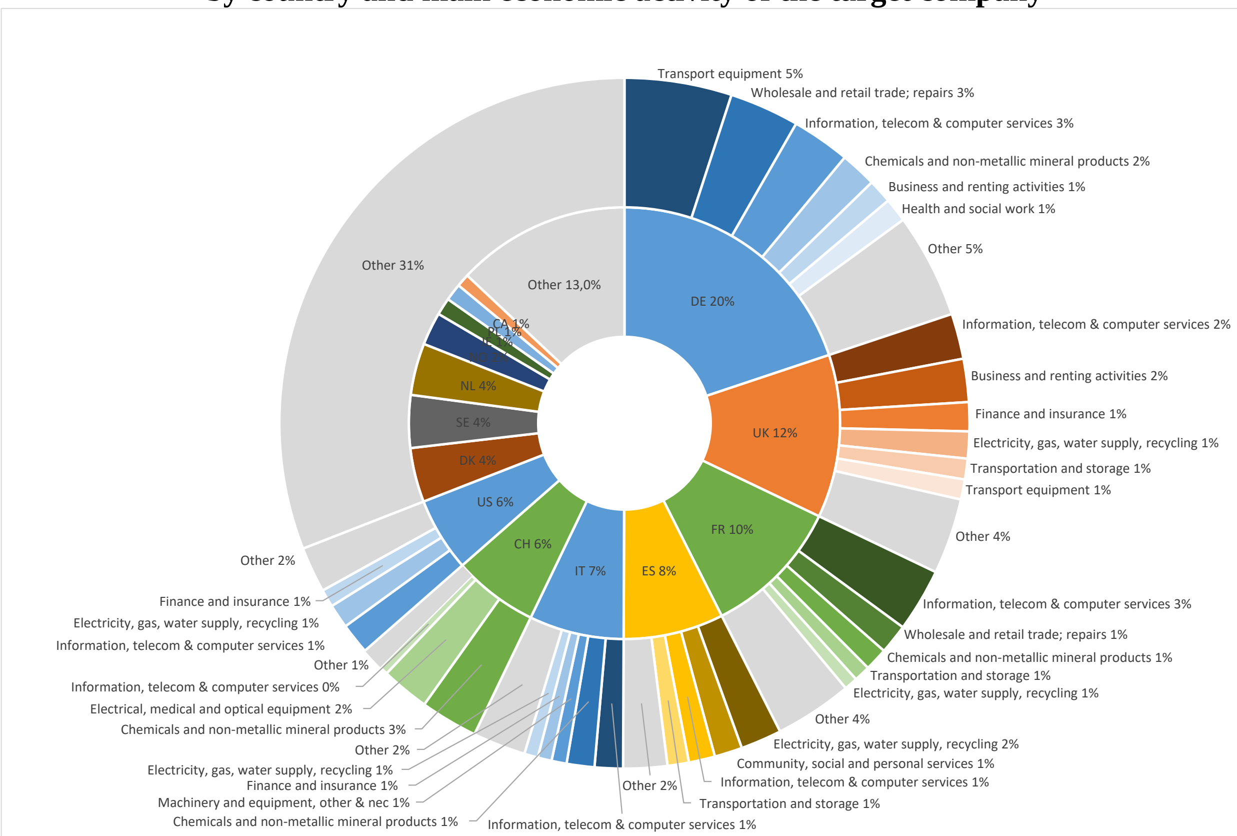
On both the asset and liability sides of the holding and acquisition structure, the counterpart "Other resident entities" mostly consists of CFIs (sector 127) whose type could not be identified from the data available in the Central Balance Sheet Register. On the liability side of the holding and acquisition structure, the counterpart "Other resident entities (IL_L)" also includes private equity and real estate investment funds domiciled in Luxembourg.[40]

[40] Resident CFIs (sector S127) account for 75% of the number of "Other resident entities (IL_L)" on the liability side of resident CFIs. Investment funds domiciled in Luxembourg (*i.e.* non-money market funds investment funds, sector S124) account for 20% of the number of "Other resident entities (IL_L)" on the liability side. On the asset side, resident CFIs (sector S127) account for 95% of the number of "Other resident entities (IL_A)".

5.2 Decomposition of outward FDI position in private equity by country

Chart 2.2 breaks down the outward FDI position in private equity by country and by main economic activity of the target company. In 2021, the most important destinations are Germany (20%), the United Kingdom (12%), France (10%), Spain (8%), Italy (7%), Switzerland (6%), the United States (6%), Denmark (4%), Sweden (4%) and the Netherlands (4%). Together, they account for about 80% of the outward FDI position in private equity. Target companies are broadly dispersed across economic activities, with the share of individual economic activities differing by country considered.

Chart 2.2: Decomposition of outward FDI position in private equity (*FDI_A* in PE) by country and main economic activity of the target company

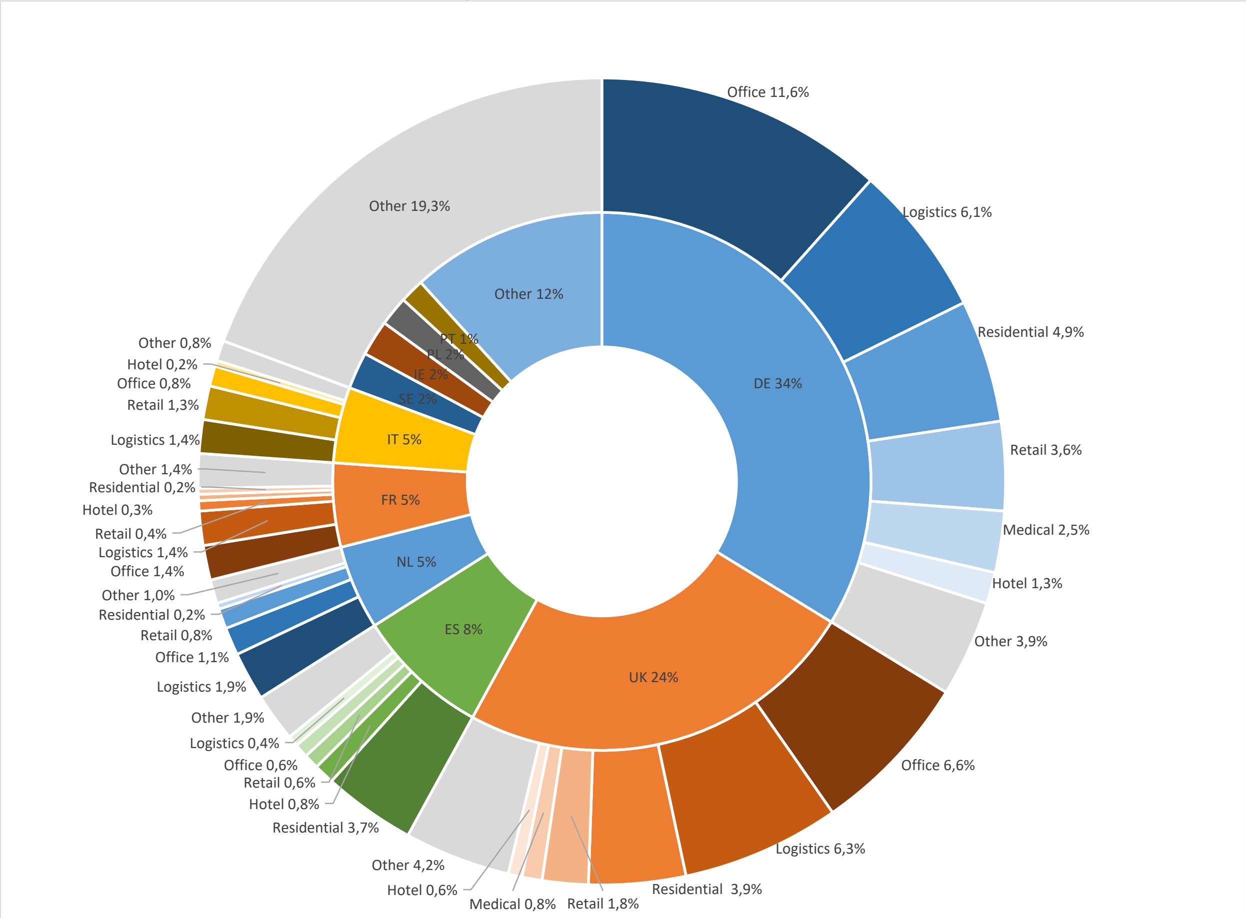


Unit: Percent of outward FDI position in private equity in 2021

5.3 Decomposition of outward FDI position in real estate by country

Chart 2.3 breaks down the outward FDI position in real estate by target country and by property type. In 2021, the most important destinations are Germany (34%), the United Kingdom (24%), Spain (8%), the Netherlands (5%), France (5%) and Italy (5%). Together, they account for about 80% of the outward FDI position in real estate. The main property types are office, retail, logistics and residential properties, although their respective share differs according to the destination country.

Chart 2.3: Decomposition of outward FDI position in real estate (*FDI_A* in RE) by target country and property type



Unit: Percent of outward FDI position in real estate in 2021

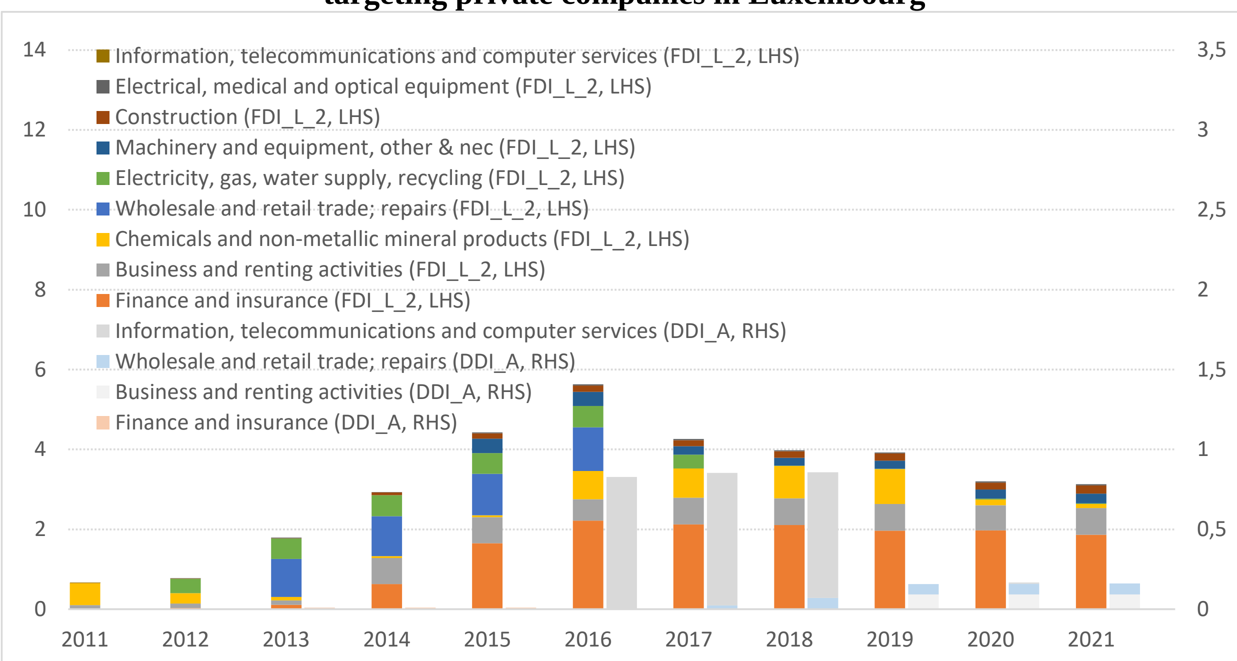
5.4 Focus on Luxembourg

Charts 3.1 and 3.2 concentrate on targets located in Luxembourg held by non-resident and resident investment funds focusing on private equity or real estate. This corresponds to the inward FDI position with non-resident sponsors ultimately investing in targets that are resident in Luxembourg (*FDI_L*$_2$) and to the domestic direct investment position with resident sponsors ultimately investing in targets that are resident in Luxembourg (*DDI_A*).[41]

For both private equity and real estate assets (Charts 3.1 and 3.2), the inward FDI position *FDI_L*$_2$ is larger than the domestic direct investment position *DDI_A*.

Target companies in Luxembourg operate mostly in finance and insurance activities (Chart 3.1). In 2021, the inward FDI position in private companies amounts to 3.1 billion euros. In comparison, the domestic direct investment position amounts to 162 million euros.

Chart 3.1: Inward FDI position (*FDI_L*$_2$) and domestic direct investment position (*DDI_A*) targeting private companies in Luxembourg



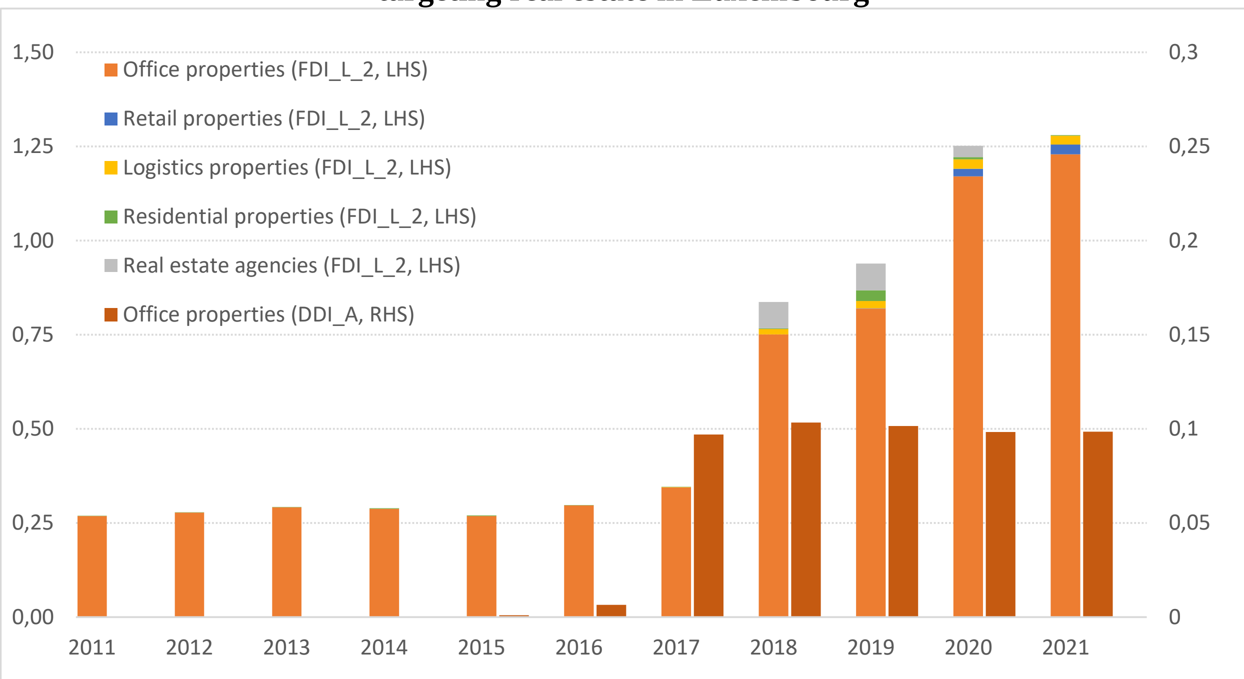
NB: For each period, the left bar represents the inward FDI position *FDI_L*$_2$ (left-hand scale, LHS). The right bar represents the domestic direct investment position *DDI_A* (right-hand scale, RHS). Unit: Billions of euros

[41] See sections 2.2 and 2.4.

Real estate targets in Luxembourg are essentially office properties (Chart 3.2). In 2021, the inward FDI position amounts to 1.2 billion euros for commercial properties (office and retail), 24 million euros for logistics properties, and 1.6 million euros for residential properties. In comparison, the domestic direct investment position amounts to 98 million euros for commercial properties.

In 2021, the total direct investment position in the residential real estate market by resident and non-resident investment funds amounts to 1.6 million euros. The latter figure represents less than 1% of the total value of residential property sales in Luxembourg from 2011 to 2021.[42,43]

Chart 3.2: Inward FDI position (*FDI_L_2*) and domestic direct investment position (*DDI_A*) targeting real estate in Luxembourg



NB: For each period, the left bar represents the inward FDI position *FDI_L_2* (left-hand scale, LHS). The right bar represents the domestic direct investment position *DDI_A* (right-hand scale, RHS). Unit: Billions of euros

Overall, Charts 2.1 to 3.2 indicate that most FDI flows initiated by sponsors managing investment funds focusing on private equity or real estate transit *via* Luxembourg to be invested abroad, mostly in Western Europe (especially the euro area). Only a minority of FDI flows are

[42] The total volume of transactions in the real estate residential market over the period 2011-2021 is available from the STATEC in the Excel file "*D4011: Acquisition prices for dwellings – C.xlsx*" at: https://statistiques.public.lu/fr/donnees/themes/entreprises/construction-logement.html.

[43] Public institutions do not provide data regarding the volume of transactions in the commercial (office and retail properties) or industrial (logistics properties) real estate markets in Luxembourg.

ultimately invested in targets located in Luxembourg. In 2021, private companies in Luxembourg accounted for about 0.64% of the inward FDI position while real estate targets located in Luxembourg accounted for about 0.26% of the inward FDI position.

6. Conclusion

This paper presents a new database of direct investment positions held through captive financial institutions (CFIs) in Luxembourg that are owned by (resident and non-resident) investment funds focusing on private equity or real estate. Compared to Di Filippo (2023), the new database is more comprehensive as it includes smaller CFIs with less than 500 million euros in total assets.

Over 2011-2021, intra-Luxembourg investment positions were larger than foreign direct investment (FDI) positions (both inward and outward). Most of these intra-Luxembourg investment positions arise because investment funds use Luxembourg CFIs to structure their holdings and acquisitions across countries. In 2021, only about 1% of the inward FDI position held through these CFIs is ultimately invested in targets located in Luxembourg. The outward FDI position held through these CFIs is invested in private companies (65%) or real estate assets (35%). While most investment fund sponsors are headquartered in the United States or in the United Kingdom, investment targets are mostly in Western Europe, with a focus on the euro area. Outward FDI in private equity targets companies that are quite dispersed across economic activities. In 2021, “Information, telecommunications and computer services” have the largest share (17%), followed by “Electricity, gas, water supply, recycling” (12%) and “Chemicals and non-metallic mineral products” (10%). Outward FDI in real estate is more concentrated by property type, with 45% in commercial buildings (office and retail properties), 24% in industrial buildings (in particular logistics properties) and 15% in residential properties. Targets in Luxembourg are mostly companies operating in finance and insurance activities (private equity) or office properties (real estate).

While attempting to provide a clearer picture of FDI positions initiated *via* CFIs in Luxembourg, this paper can be improved in several ways. On the liability side, the upstream part of the financing chain deserves more investigation to complete the distribution of capital positions. This would provide a better understanding of the entities composing the Limited Partners (client counterpart) and the external investors. For example, the analysis of the counterparts for loans as other investment (*L_OI_L*) could provide more information on interlinkages with banks. A similar argument applies to the analysis of investors purchasing debt securities as portfolio investment (*D_PI_L*) issued by CFIs owned by investment funds focusing on private equity or real estate. This paper focuses on the downstream part of the financing chain, providing detailed information about the target counterpart (country and main economic activity). Improvements can still be made on the asset side, for example to understand the objective of sponsors investing in private companies (*e.g.* organic growth, external growth, *etc*.) or in real estate properties (*e.g.* buy-to-let investment, renovation, transformation, ground-up construction, *etc*.). This would provide a better understanding of the economic impact of FDI by investment funds focusing on private equity or real estate.

Eventually, this paper decomposed direct investment positions by concentrating on CFIs affiliated to investment funds focusing on private equity or real estate. A similar exercise can be undertaken for CFIs affiliated to groups undertaking other activities, especially groups active in non-financial activities. This would provide a more comprehensive picture of the inward and outward FDI position in Luxembourg. This is left for future research.

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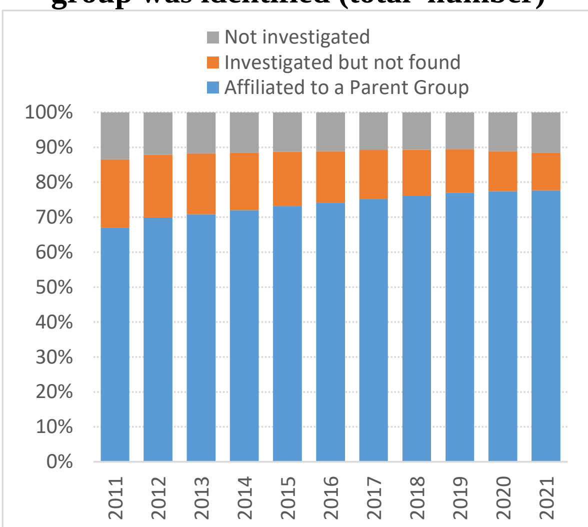
Appendix

A. Data coverage for group affiliation

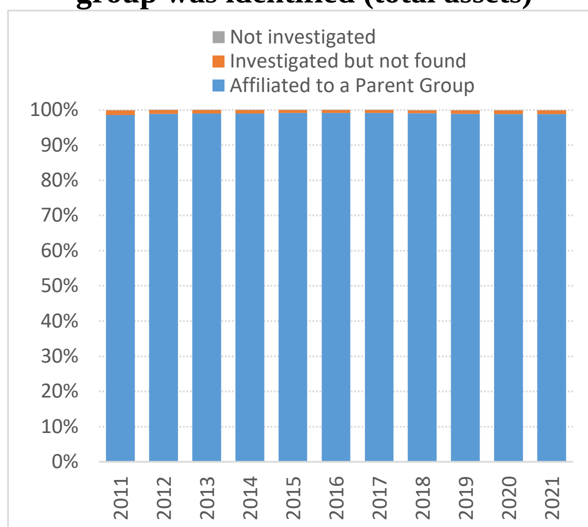
Charts A.1 and A.2 present the share of CFIs for which the parent group has been identified. On average, over the period 2011-2021, CFIs with an identified parent group cover 99% of total assets and 74% of the total number of CFIs in the database.

Chart A.1: Share of CFIs where parent group was identified (total number)



Unit: Percent of total number

Chart A.2: Share of CFIs where parent group was identified (total assets)

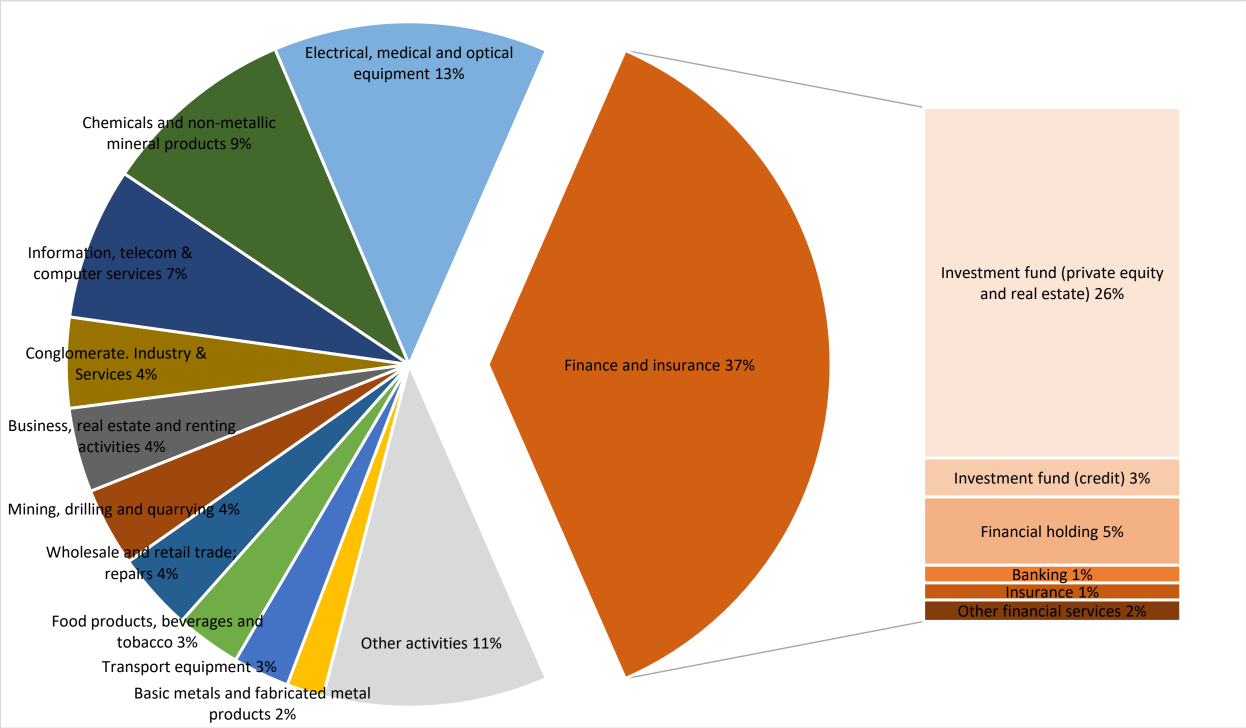


Unit: Percent of total assets

Chart A.3 breaks down the total assets of CFIs resident in Luxembourg by the main economic activity performed by their parent group[44]. In 2021, groups active in “Finance and insurance” own the largest share of CFIs (37%) followed by “Electrical, medical and optical equipment” (13%), “Chemicals and non-metallic mineral products” (9%), “Information, telecommunications and computer services” (7%), “Conglomerates. Industry & Services” (4%), “Business, real estate and renting activities” (4%), “Mining, drilling and quarrying” (4%), “Wholesale and retail trade; repairs” (4%), “Food products, beverages and tobacco” (3%), “Transport equipment” (3%) and “Basic metals and fabricated metal products” (2%). Together, these categories account for about 90% of the total assets held by CFIs in Luxembourg.

[44] Chart A.3 considers only CFIs for which the parent group has been identified.

Chart A.3: Total assets of CFIs by main economic activity of their parent group

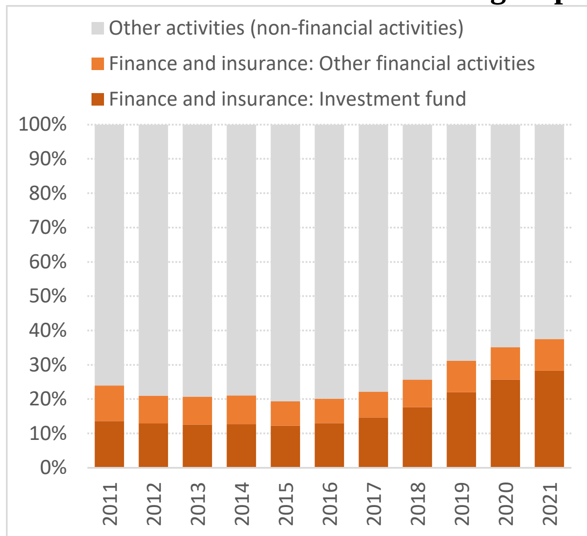


Source: BCL, new database based on EGR-SBR-CBSR. Unit: Percent of total assets held by CFIs affiliated to a group in 2021

Within the set of CFIs owned by finance and insurance groups, 78% of CFI assets are owned by investment funds in 2021 (Chart A.3). About 90% of these assets are owned by investment funds focusing on private equity or real estate. The remainder is mostly owned by credit investment funds.

Chart A.4 presents the evolution of the shares of total assets held by CFIs affiliated to groups operating in finance and insurance (financial activities) and those undertaking non-financial activities. The share of total assets of CFIs affiliated to groups undertaking financial activities increases from 2015, mainly driven by investment funds. In comparison, the share of total assets of CFIs affiliated to groups operating in other activities (mainly non-financial activities) declines starting in 2015.

Chart A.4: Activities of affiliated group

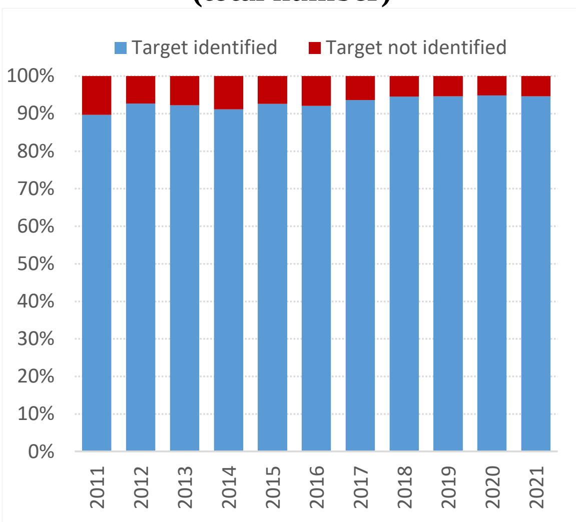


Units: Percent

B. Data coverage for identified targets

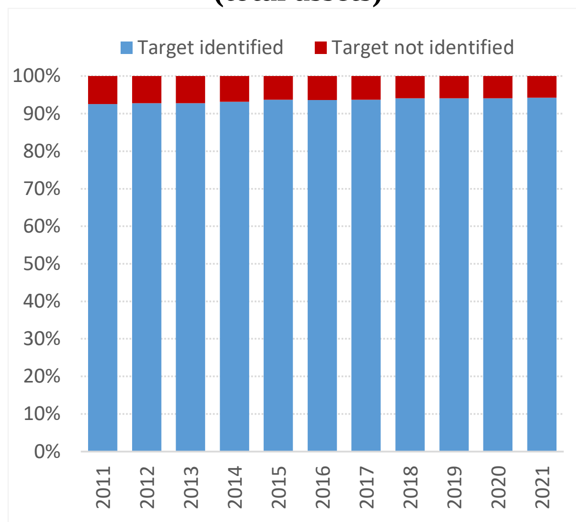
Charts B.1 and B.2 present the coverage of identified targets for CFIs in the database that were affiliated to investment funds focusing on private equity or real estate. On average, over the period 2011-2021, identified targets accounted for 93% of total assets and 94% of the total number of CFIs affiliated to investment funds focusing on private equity or real estate.

Chart B.1: Share of identified targets for CFIs affiliated to investment funds focused on private equity or real estate (total number)



Unit: Percent of total number

Chart B.2: Share of identified targets for CFIs affiliated to investment funds focused on private equity or real estate (total assets)

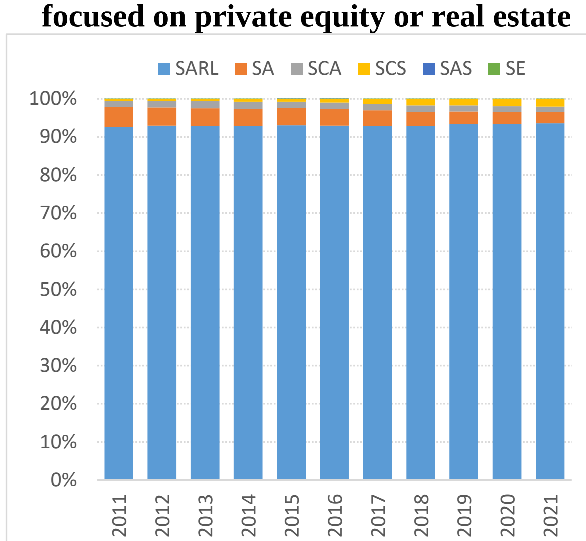


Unit: Percent of total assets

C. Data coverage for immediate counterpart country

Chart C.1 presents the share of different company types taken by CFIs affiliated to investment funds focused on private equity or real estate. Company types include limited liability companies (*Société à responsabilité limitée*, SARL), limited partnerships (*Société en commandite simple*, SCS), public limited companies (*Société anonyme*, SA), simplified shareholder companies (*Société par actions simplifiée*, SAS), partnerships limited by shares (*Société en Commandite par Actions*, SCA) and European companies (*Société européenne*, SE).

Chart C.1: Company types for CFIs affiliated to investment funds focused on private equity or real estate

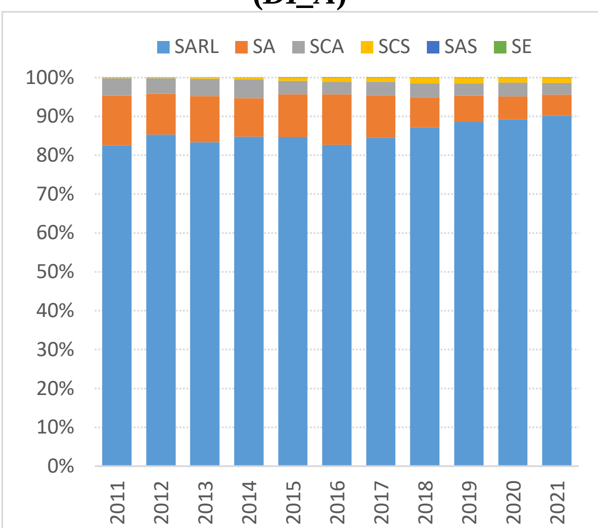


Unit: Percent of total number

SARL companies represent the most important category among CFIs affiliated to investment funds that focus on private equity or real estate. Over the period 2011-2021, SARL companies accounted for 93% of the total number of CFIs considered.

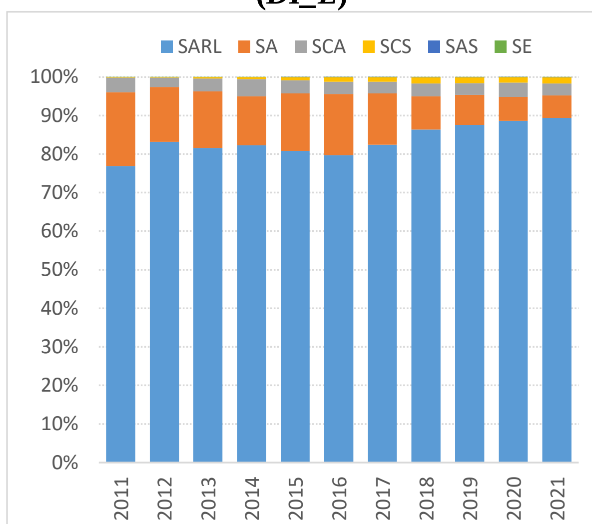
Charts C.2 and C.3 present the distribution of direct investment (*DI*) positions across company types, on the asset side ($DI\_A=NFA^{RE}+E\_DI\_A+D\_DI\_A$) and on the liability side ($DI\_L=E\_DI\_L+D\_DI\_L$). For both asset and liability sides, SARL companies represent the most important category. On average over the period 2011-2021, SARL companies accounted for 86% of CFIs' direct investment position on the asset side and 84% of CFIs' direct investment position on the liability side.

Chart C.2: Company types for CFIs affiliated to investment funds focused on private equity or real estate: asset side (*DI_A*)



Unit: Percent of direct investment position on the asset side

Chart C.3: Company types for CFIs affiliated to investment funds focused on private equity or real estate: liability side (*DI_L*)



Unit: Percent of direct investment position on the liability side

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