



IFC - Central Bank of Armenia Workshop on "*External Sector Statistics*"

Dilijan, Armenia, 11-12 June 2018

Enhancing internal consistency of Luxembourg External Statistics,¹

Paul Feuvrier,

Central Bank of Luxembourg

¹ This paper was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

Enhancing internal consistency of Luxembourg External Statistics¹

The case for a semi aggregated and sectoral analysis of Financial Account

Paul Feuvrier, Banque centrale du Luxembourg

Luxembourg financial industry is highly diversified: Deposit Taking Corporations, Investment Funds, Securitisation Vehicles, Insurance Corporations and Captive Financial Institutions. Banque centrale du Luxembourg (BCL) collects detailed quarterly Balance Sheets completed by monthly Security by Security reports (positions), but the picture is different from one sector to another. Indeed, the collection of granular information on liquid financial instruments (e.g. standard debt securities, listed shares, both with known price) does not pose major problems other than those quality issues inherent to any statistical survey. Yet unlisted equities and hybrid instruments issued and held by Captive Financial Institutions are difficult to assess exhaustively and accurately (valuation of unlisted shares) in the short run. In addition, the lines between transactions and price effects are sometimes blurred. The underlying uncertainty possibly generating ex ante both errors and omissions and other volume changes, BCL not only corrects for non-response but also performs ad hoc analysis both at detailed and semi aggregated level. Last, data sharing is a part of the answer: BCL uses mirror transactions (counterpart country), and provides the ECB and European partner countries with information on large FDI transactions involving Luxembourg.

Keywords: Errors and omissions, External Statistics, Foreign Direct Investment.

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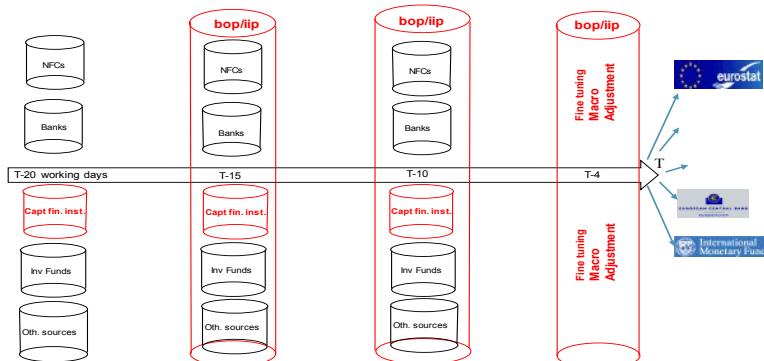
"Moment of truth" for External Statistics

Quality is a universal issue in official statistics but quality problems may be more or less hidden whenever a single source is used. This is not the case in external statistics, with asymmetries on the one hand, errors and omissions on the other hand. Asymmetry in FDI statistics is not a new phenomenon, yet International Organisation have significantly increased the detail of FDI figures released in the recent period. The IMF, for instance, releases bilateral FDI positions (Coordinated Direct Investment Survey database), thus two (possibly diverging) sources exist for Direct Investment from country A to country B (FDI asset reported by A and FDI liability reported by B).

Another "objective" traditional quality indicator related to External Statistics is errors and omissions, which can be observed at both national and regional level: Even small national errors and omissions can bring about large regional ones because of possible uncertainty on the counterpart country (inside or outside the region, e.g. euro area). How does BCL address those quality issues?

Simplified workflow on quarterly Luxembourg bop/iip

The integration of various sources in Luxembourg bop/iip is summarised below. At early stages of the production process, the priority is to monitor the quality of each sectoral dataset. Later on, those various sectoral datasets are integrated in a dedicated External Statistics database (as for their assets and liabilities vis-à-vis the rest of the world). This integration gives a first estimation of net i.i.p. and quarterly errors and omissions, which may be quite high and warrant "end of pipe" adjustments (described later in this note).



Institutional sectors are often interrelated, which also impacts external statistics. Let's take the instance of an investment fund held by a foreign investor and ultimately granting a loan to a foreign company. Three different patterns are possible:

- The investment fund directly holds the loan, which is recorded on the asset side of the investment fund: liability of S.124, asset of S.124.
- The investment fund holds the loan through a resident securitization vehicle (S.125), which is the institutional unit holding the loan: liability of S.124 but asset of S.125.
- The investment fund holds the loan through a resident captive financial institution (S.127) which is the institutional unit holding the loan: liability of S.124, asset of S.127.

Survey strategy on Luxembourg financial sector

BCL harmonised survey strategy towards Luxembourg financial industry is based on three principles:

- To directly collect balance sheets (direct reporting system) instead of relying on custodian data (those custodian data remaining useful for government entities, households and NPISHs),
- To collect positions only (much easier to report from the reporters perspective),
- To derive transactions by correcting monthly variations of positions from forex and price effects and by using auxiliary sources.

Accordingly, Luxembourg financial institutions provide BCL with two harmonized reports:

- A quarterly full balance sheet, without any detail on security positions,
- A monthly security by security form for ISIN and non ISIN securities.

The largest sectors (in terms of aggregate Balance Sheet) are Investment Funds and Captive Financial institutions. The reporting forms are harmonized but remain somewhat targeted to each institutional sector they refer to, especially on the capital side:

- Investment funds shares issued for money market and investment funds,
- Technical reserves for insurance companies,
- Equity capital for remaining sectors.

Direct reporting of Luxembourg financial institutions in a nutshell

Mi = monthly Security by Security, overall ISIN

Mn = monthly Security by Security, overall non ISIN

Q = quarterly full balance-sheet, without any detail on security items

	Dep.-tak. Corp	Mon. mark. Funds	Inv. funds	Sec. vehicles	Captive fin. Instit.	Ins. corp.
SNA 2008	S122	S123	S124	S125	S127	S128
Ag. Balance Sheet bn euros 31/12/2017	746	292	4 253	249	8 947	186
Switch from custodian to direct reporting	2008	2008	2008	2010	2011	2015
1-Assets						
1-Loans to affiliated	Q				Q	
1-Securitised loans				Q		
1-Deposits	Q	Q	Q	Q	Q	Q
1-Bonds and bills	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
1-Equities	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
1-Participations in affiliated	Q	Q	Q	Q	Mn Q	Q
1-Fixed assets	Q	Q	Q	Q	Q	Q
1-Remaining assets	Q	Q	Q	Q	Q	Q
1-Technical reserves						Q
1-Financial derivatives	Q	Q	Q	Q	Q	Q
2-Liabilities						
2-Borrowing from affiliated	Q	Q	Q	Q	Q	Q
2-Borrowing from banks		Q	Q	Q	Q	Q
2-Deposits	Q					
2-Debt securities	Mi q	Mi q	Mi q	Mi q	Mn q	Mi q
2- Short sales of securities	Mi q	Mi q	Mi q	Mi q	Mi q	Mi q
2-Capital, reserves, provisions and results	Q			Q	Mn Q	Q
2-Investment funds shares		Mi Q	Mi Q			
2-Technical reserves						Q
2-Remaining liabilities	Q	Q	Q	Q	Q	Q
2-Financial derivatives	Q	Q	Q	Q	Q	Q

Source: Banque centrale du Luxembourg

B.o.p./i.i.p. consistency by sector

Functional categories are the cornerstone of External Statistics but Luxembourg Financial institutions typically contribute to several of them. For instance, a bank would issue bonds and bills (Portfolio Investment) and lend the proceeds to banks, households and NFCs (Other Investment). In Luxembourg, a sectoral analysis is more relevant to assess the overall quality and spot possible mistakes. It also makes it easier to monitor the consistency between bop/iip and national accounts. We give below a few instances on flow/stock reconciliation for some sectors and how to read them. Positions and transactions are completed with forex, price effects and other volume changes.

Sectoral analysis – Deposit taking corporations

Many Luxembourg banks are held by foreign investors (Direct Investment liabilities). Unsurprisingly, Deposit taking corporations overall take deposits, grant loans and hold bonds. In the instance below (2016 Q2), deposit withdrawal (Other Investments) is financed by the issuance of a bill (Portfolio Investment).

LU flow/stock reconciliation												
Deposit taking corporations except the central bank												
Billions of euros												
	Assets					Liabilities						
	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2
Total - Dep. taking corp. / RoW	586	4	4	3	-1	596	486	0	3	2	0	491
Direct investment	3	0	0	0	0	3	33	0	0	0	0	33
Portfolio investment	138	-2	1	0	0	137	39	6	0	-1	0	44
Equity	3	0	0	0	0	3	0	0	0	0	0	0
Investment fund shares	1	0	0	0	0	2	0	0	0	0	0	0
ST debt securities	11	-1	0	0	-3	7	15	5	0	-1	0	19
LT debt securities	122	-1	1	0	3	126	23	1	0	0	0	25
Financial derivatives	22	0	0	3	0	25	36	0	0	3	0	39
Other investment	423	7	3	0	-1	432	378	-7	3	0	0	374

Source: Banque centrale du Luxembourg

Sectoral analysis – Investment funds

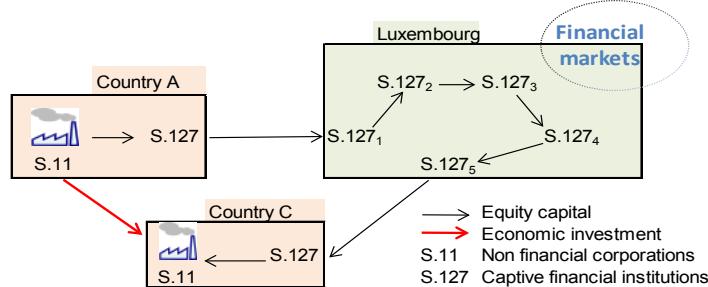
Most investment funds are equities, bonds or mixed funds, holding liquid securities (listed shares or bonds), which are identified by an international standard (ISIN) and for which market price and other relevant information (coupon rate, etc...) is readily available. Against this backdrop, the derivation of transactions, FX and price effects does not pose major issues. In the instance below, investment funds shareholders purchase shares, and the funds invests in equities, bonds and deposits. Besides, drop in share prices is reflected on the liability side (along with negative FX).

LU flow/stock reconciliation												
Investment funds												
Billions of euros		Assets					Liabilities					
Position 2015 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2015 Q3		Position 2015 Q2	Trans.	FX	Price effect		
Oth. Vol. Ch.							Oth. Vol. Ch.					
Total - Investment funds / RoW	3 011	42	-39	-140	3	2 878	3 198	56	-18	-185	3	3 053
Direct Investment	20	0	0	0	1	20	0	0	0	0	0	0
Portfolio investment	2 748	25	-36	-131	2	2 809	3 011	35	-13	-182	3	2 853
Equity	1 211	17	-21	-110	-1	1 098						
Investment fund shares	191	0	-1	-7	1	185	3 011	35	-13	-182	3	2 853
ST debt securities	108	1	-1	0	0	107	0	0	0	0	0	0
LT debt securities	1 237	7	-13	-14	1	1 219	0	0	0	0	0	0
Financial derivatives	148	-6	0	-9	0	133	121	0	0	-3	0	118
Other investment	96	23	-3	0	0	116	66	21	-5	0	0	82

Source: Banque centrale du Luxembourg

Sectoral analysis – Captive Financial Institutions

The sector of Captive Financial Institutions is both the biggest (foreign assets and liabilities) and the most challenging to cover. As for the business model, in a nutshell, foreign Multinational Enterprises set up Captive Financial Institutions in Luxembourg to channel funds. Some entities raise funds on financial markets on behalf of the mother company, yet the majority of the population is made of so-called "pure holdings", which have no access to financial markets. Some institutions have all their assets and liabilities vis-à-vis other resident institutions. (S.127₂ to S.127₄ below), yet each "group of Captive Financial Institutions" theoretically display a "small" contribution to Luxembourg net i.i.p.. Besides, reporters value the companies using Luxembourg GAAP, US GAAP or IFRS accounting standards. Some positions may therefore be valued at market price and corresponding assets at OFBV or the other way round. This warrants "semi aggregated" adjustments at "group" level with a view to reducing those imbalances.



As far as Balance Sheet movements are concerned, it is often difficult to distinguish transactions from price effects: perception/distribution of a super dividend (to be recorded as a financial account transaction), issuance of a share premium, the number of shares being unchanged (transaction), impairment (price effect), etc... Thanks to an ad-hoc editing system, BCL edits and checks large transactions and variations of positions. BCL shares large transactions with European counterpart countries ("FDI network") with a view to reducing asymmetries.

In the instance below, we have large transactions on both asset and liability side, but also some large Other Volume Changes reflecting above-mentioned necessary adjustments.

Billions of euros	LU flow/stock reconciliation											
	Captive financial institutions					high quality items						
	Assets				Liabilities							
	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3
Total - Captive fin. Inst. / RoW	5 632	-217	-109	-5	-34	5 267	5 665	-238	-109	-18	-2	5 298
Direct investment	5 256	-218	-103	6	-34	4 906	4 632	-241	-90	-16	-8	4 278
Equity	3 093	-179	-77	6	-34	3 615	3 087	-200	-57	-16	0	2 815
Loans	1 363	-39	-26	0	-6	1 291	1 546	-41	-33	0	-8	1 463
Portfolio investment	154	4	-2	0	0	156	738	11	-16	8	5	746
Equity	82	1	-1	0	0	82	21	3	0	2	0	25
Investment fund shares	11	3	0	0	0	14	0	0	0	0	0	0
ST debt securities	5	1	0	0	0	6	14	-3	0	1	0	12
LT debt securities	56	-2	-1	0	0	53	704	11	-15	5	5	709
Financial derivatives	30	0	0	-11	0	19	34	0	0	-10	0	24
Other investment	191	-2	-4	0	1	185	261	-9	-3	0	1	250

Source: Banque centrale du Luxembourg

Adjustment procedures

BCL spots five “bop items” T1 to T5 candidates for adjustments, corresponding to the largest contributions of Captive Financial Institutions in External Statistics: Direct Investment equities and loans Assets and Liabilities and Portfolio Investment Liabilities. In other worlds, it is of high probability that large ex ante Errors and Omissions (EO) and Other Volume changes (OVC) reflect uncertainties in T1 to T5 (transactions). Last, FX is for forex change and PR for price effects.

Captive financial institutions	high quality items					medium/high quality items					
	Assets					Liabilities					
	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q
Total - Captive fin. Inst. / RoW											
Direct investment											
Equity	T1 = T A eq				OVC1	T3 = T L eq				OVC3	
Loans	T2 = T A lo				OVC2	T4 = T L lo				OVC4	
Portfolio investment											
Equity											
Investment fund shares											
ST debt securities											
LT debt securities											
Financial derivatives											
Other investment											

Source: Banque centrale du Luxembourg

First situation

EO ex ante > 0

The purpose of the adjustment is to reduce net financial account transactions, ie:
To reduce T1, T2 (A) or to increase T3, T4 and T5 (L)

Second situation

EO ex ante < 0

The purpose is to increase net financial account transactions, ie:

To increase T1, T2 (A) or to reduce T3, T4 and T5 (L)

Besides, OVC being calculated as a residual, we have for i = 1 to 5 :

$$\begin{aligned} \text{Pos}_{i,t} &= \text{Pos}_{i,t-1} + \text{Tr}_{i,t} + \text{Fx}_{i,t} + \text{Pr}_{i,t} + \text{OVC}_{i,t} \\ \text{Pos}_{i,t} &= \text{Pos}_{i,t-1} + \text{Tr}^*_{i,t} + \text{Fx}_{i,t} + \text{Pr}_{i,t} + (\text{OVC}_{i,t} + \text{Tr}_{i,t} - \text{Tr}^*_{i,t}) \\ \text{OVC}^*_{i,t} &= \text{OVC}_{i,t} + \text{Tr}_{i,t} - \text{Tr}^*_{i,t} \end{aligned}$$

Large OVC being undesirable, the adjustment should produce $|\text{OVC}^*_{i,t}| < |\text{OVC}_{i,t}|$

To sum up we switch from $(\text{Tr}_{1,t}, \dots, \text{Tr}_{5,t})$ to $(\text{Tr}^*_{1,t}, \dots, \text{Tr}^*_{5,t})$ with both:

$$\begin{aligned} |\text{EO}^*_{t}| &< |\text{EO}_t| \text{ and} \\ |\text{OVC}^*_{1,t}| &< |\text{OVC}_{1,t}|, \dots, |\text{OVC}^*_{5,t}| < |\text{OVC}_{5,t}| \end{aligned}$$

Conclusion

Above-mentioned «objective» external statistics quality issues require bold reactions from official statisticians. BCL managed to cover the large, diversified and open financial industry through a harmonised and efficient survey strategy. BCL systematically collects and checks micro data, some of them being shared with counterpart countries and International Organisations. Many Luxembourg or foreign captive financial institutions cannot be identified by a Global Legal Entity Identifier (GLEI) so far. Yet the efficiency of the data sharing process will improve, in particular for direct investment transactions, when this GLEI is in force in the whole financial industry, probably in the medium run.

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IFC workshop, Dilijan, June 2018

Paul Feuvrier, Banque centrale du Luxembourg



Enhancing consistency of Luxembourg External Statistics

- . **1 - Disclaimer**
- . **2 - “Moments of truth” for External Statistics**
- . **3 - Simplified workflow on quarterly Luxembourg bop/iip**
- . **4 - Survey strategy on Luxembourg financial sector**
- . **5 - B.o.p./i.i.p. consistency by sector**
- . **6 - Adjustment procedures**
- . **7 - Conclusion**

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2 – “Moments of truth” for External Statistics

1 - FDI asymmetries

- US Dir. Inv. equities in LU
- IMF web site
 - Source LU
 - **640 \$ billions**
 - Source US
 - **472 \$ billions**

The screenshot shows the IMF's Direct Investment Data interface. The top navigation bar includes 'Report', 'Home', 'Refresh', 'Autoupdate', 'Export', 'Controls', and 'Find'. Below the navigation is a search bar with 'Calendar: 2015' and 'Country: Luxembourg'. The main content area displays 'Table 1-i: Inward Direct Investment Positions, as of end-2015 Reporting Economy: Luxembourg'. The table is titled 'US Dollars, Millions' and has columns for 'Investment from:' (United States), 'Inward Direct Investment Positions', 'Inward Equity Positions (Net)', '(Net)', 'Inward Debt Instruments Positions', 'Net Debt', 'Gross Debt Instruments', and 'of which'. A red box highlights the value '639,607' in the 'Inward Equity Positions (Net)' column under 'United States'.

Investment from:	Inward Direct Investment Positions	Inward Equity Positions (Net)	(Net)	Inward Debt Instruments Positions			of which
				Inward Debt: Resident Financial Intermediaries (Net)	Inward Debt: Resident Enterprises that are not Financial Intermediaries (Net)	Inward Debt Instruments Liabilities (Gross)	
United States	736,318	639,607	96,711				
Uruguay	C	C	C				
US Pacific Islands	C	C	C				
US Virgin Islands	0	0	0				
Uzbekistan	0	0	0				
Vanuatu	0	0	0				
Vatican	0	0	0				

2 – Errors and omissions

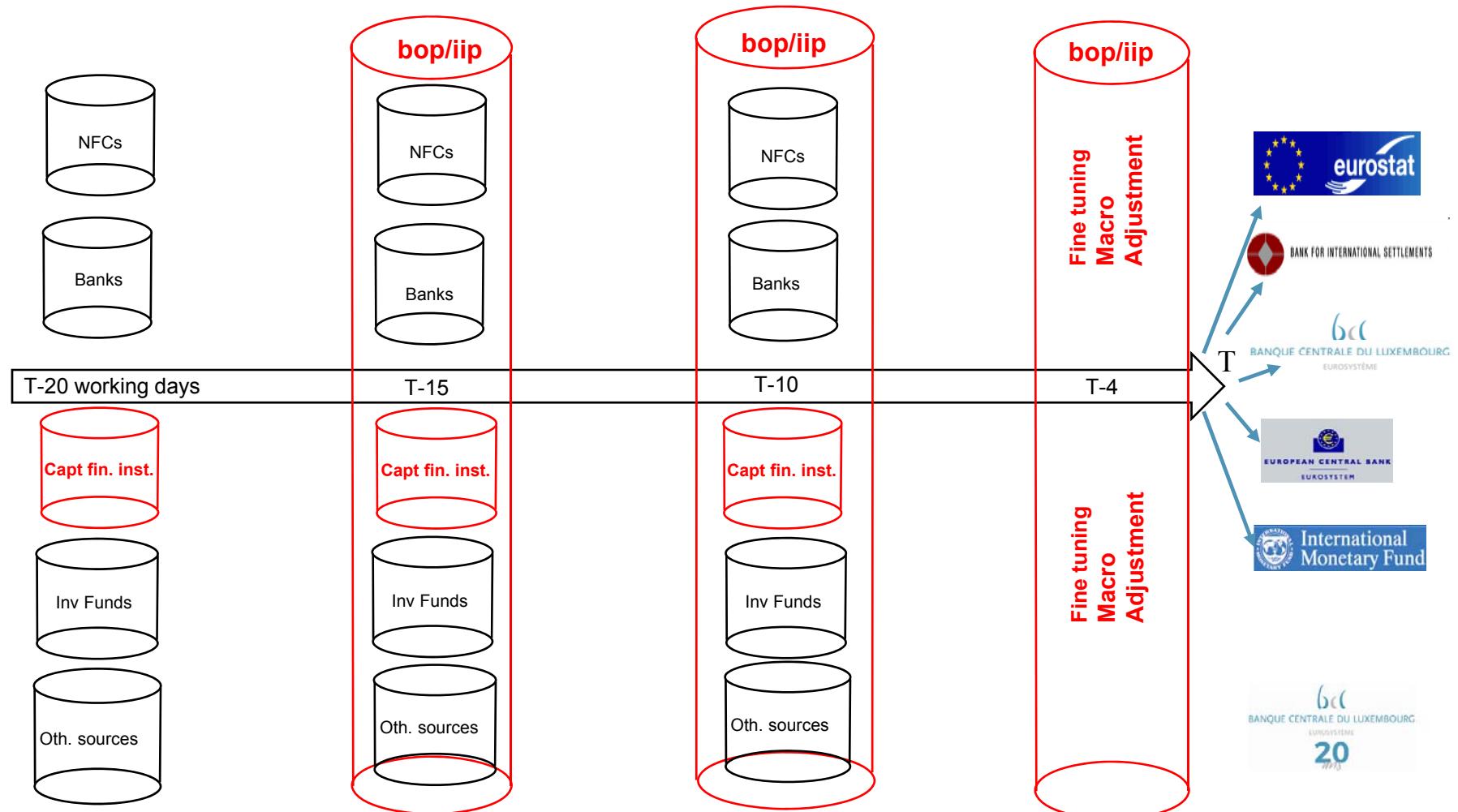
- National
- Regional level
 - e.g. euro area
- Reflecting asymmetries

The screenshot shows the IMF's Direct Investment Data interface. The top navigation bar includes 'Report', 'Home', 'Refresh', 'Autoupdate', 'Export', 'Controls', and 'Find'. Below the navigation is a search bar with 'Calendar: 2015' and 'Country: United States'. The main content area displays 'Table 1-o: Outward Direct Investment Positions, as of end-2015 Reporting Economy: United States'. The table is titled 'US Dollars, Millions' and has columns for 'Investment in:' (Luxembourg), 'Outward Direct Investment Positions', 'Outward Equity Positions (Net)', '(Net)', 'Outward Debt Instruments Position', 'Net Debt', 'Gross Debt Instruments', and 'of which'. A red box highlights the value '471,573' in the 'Outward Equity Positions (Net)' column under 'Luxembourg'.

Investment in:	Outward Direct Investment Positions	Outward Equity Positions (Net)	(Net)	Outward Debt Instruments Position			of which
				Net Debt	Gross Debt Instruments		
Luxembourg	502,998	471,573	31,425	C	C	70,377	38,952
Macedonia, FYR	17	C	C	C	C	C	C
Madagascar	170	C	C	C	C	C	C
Malawi	-3	C	C	C	C	C	C
Malaysia	13,959	12,158	1,801	C	C	4,849	3,048
Maldives	C	C	C	C	C	C	C
Mali	1	C	C	C	C	C	C

3 - Simplified workflow on quarterly Luxembourg bop/iip

- Financial account only
 - LU current and capital account not dealt with in this presentation



4 – Survey strategy on Luxembourg financial sector

Direct reporting of Luxembourg financial institutions in a nutshell

Mi = monthly Security by Security, overall ISIN

Mn = monthly Security by Security, overall non ISIN

Q = quarterly full balance-sheet, without any detail on security items

	Dep.-tak. Corp	Mon. mark. Funds	Inv. funds	Sec. vehicles	Captive fin. Instit.	Ins. corp.
SNA 2008	S122	S123	S124	S125	S127	S128
Ag. Balance Sheet bn euros 31/12/2017	746	292	4 253	249	8 947	186
Switch from custodian to direct reporting	2008	2008	2008	2010	2011	2015
1-Assets						
1-Loans to affiliated		Q				Q
1-Securitised loans					Q	
1-Deposits		Q	Q	Q	Q	Q
1-Bonds and bills	Mi	q	Mi	q	Mi	q
1-Equities	Mi	q	Mi	q	Mi	q
1-Participations in affiliated		Q	Q	Q	Mn	Q
1-Fixed assets		Q	Q	Q		Q
1-Remaining assets		Q	Q	Q	Q	Q
1-Technical reserves						Q
1-Financial derivatives		Q	Q	Q	Q	Q
2-Liabilities						
2-Borrowing from affiliated		Q	Q	Q	Q	Q
2-Borrowing from banks			Q	Q	Q	Q
2-Deposits		Q				
2-Debt securities	Mi	q	Mi	q	Mi	q
2- Short sales of securities	Mi	q	Mi	q	Mi	q
<i>2-Capital, reserves, provisions and results</i>		Q			Mn	Q
<i>2-Investment funds shares</i>			Mi	Q	Mi	Q
<i>2-Technical reserves</i>						Q
2-Remaining liabilities		Q	Q	Q	Q	Q
2-Financial derivatives		Q	Q	Q	Q	Q

Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / by sector

"Traditional" presentation by functional category

Simplified presentation

Total - Financial account

Direct investment

- NFCs
- Banks
- Government
- Other sectors

Portfolio investment

- NFCs
- Banks
- Government
- Other sectors

Financial derivatives

- NFCs
- Banks
- Government
- Other sectors

Other investment

- NFCs
- Banks
- Government
- Other sectors

Reserve assets

- Central Bank

Presentation by (resident) institutional sector - more relevant to enhance consistency

Simplified presentation

Total - Financial account

NFCs

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Banks

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Government

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

Other sectors

- Direct investment
- Portfolio investment
- Financial derivatives
- Other investment

5 – b.o.p./i.i.p. consistency / Deposit taking corporations

- Net issuance of bills offset by
- Withdrawal of deposits

LU flow/stock reconciliation

Deposit taking corporations except the central bank

Billions of euros

	Assets						Liabilities					
	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2	Position 2016 Q1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2016 Q2
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Portfolio investment	138	-2	1	0	0	137	39	6	0	-1	0	44
Equity	3	0	0	0	0	3	0	0	0	0	0	0
Investment fund shares	1	0	0	0	0	2	0	0	0	0	0	0
ST debt securities	11	-1	0	0	-3	7	15	5	0	-1	0	19
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Other investment	423	7	3	0	-1	432	378	-7	3	0	0	374

Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / Investment funds

- Issuances of Investment Fund shares**
- Purchase of equities and LT debt securities**
- Deposits**
- Price effects > transactions on equities and IF shares*

LU flow/stock reconciliation

Investment funds

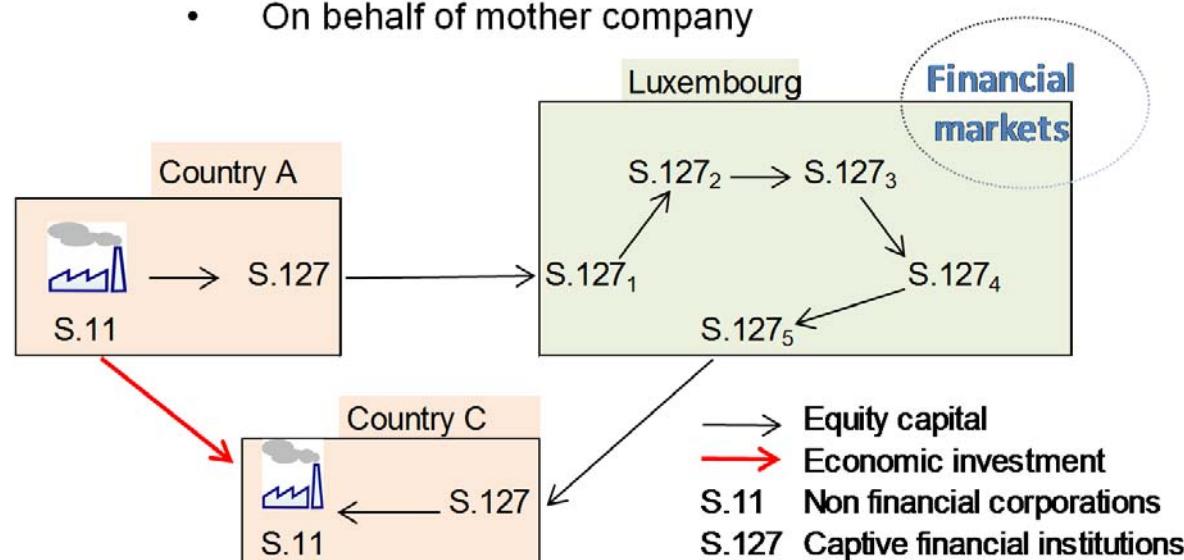
Billions of euros

	Assets						Liabilities					
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Source: Banque centrale du Luxembourg

5 – b.o.p./i.i.p. consistency / Captive Financial Institutions

- Foreign MNEs setting up institutions in LU to channel funds
 - “small” contribution of each “group of CFIs”
 - to net i.i.p.
 - to net financial account transactions
 - Pure holdings: no access to markets
 - Some CFI raise funds on financial markets
 - On behalf of mother company



5 – b.o.p./i.i.p. consistency: Captive Financial Institutions

- Issue capital / hold controlling level of equity**
- Take / grant inter company loans**
- Issue debt securities / often hybrid instruments**
- Blurred lines between**
 - Equity trans. / price effect (price increase / impairment)**
 - Transactions / Other Volume Changes**

LU flow/stock reconciliation

Billions of euros Captive financial institutions	high quality items						medium/high quality items					
	Assets			Liabilities								
	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3	Position 2017 Q2	Trans.	FX	Price effect	Oth. Vol. Ch.	Position 2017 Q3
Total - Captive fin. Inst. / RoW	5 632	-217	-109	-5	-34	5 267	5 665	-238	-109	-18	-2	5 298
Direct investment	5 256	-218	-103	6	-34	4 906	4 632	-241	-90	-16	-8	4 278
Equity	3 893	-179	-77	6	-28	3 615	3 087	-200	-57	-16	0	2 815
Loans	1 363	-39	-26	0	-6	1 291	1 546	-41	-33	0	-8	1 463
Portfolio investment	154	4	-2	0	0	156	738	11	-16	8	5	746
Equity	82	1	-1	0	0	82	21	3	0	2	0	25
Investment fund shares	11	3	0	0	0	14	0	0	0	0	0	0
ST debt securities	5	1	0	0	0	6	14	-3	0	1	0	12
LT debt securities	56	-2	-1	0	0	53	704	11	-15	5	5	709
Financial derivatives	30	0	0	-11	0	19	34	0	0	-10	0	24
Other investment	191	-2	-4	0	1	185	261	-9	-3	0	1	250

Source: Banque centrale du Luxembourg

6 - Adjustment procedures

- . 5 bop items T1 to T5 candidate for adjustments
- . Position better known
 - . First objective = reduce EO
 - . Second objective = reduce |OVC1| to |OVC5|

Captive financial institutions	high quality items						medium/high quality items											
	Assets						Liabilities											
	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q	Position Q-1	Trans.	FX	Price effect	Oth. Vol. Ch.	Position Q						
Total - Captive fin. Inst. / RoW																		
Direct investment																		
Equity																		
Loans																		
Portfolio investment																		
Equity																		
Investment fund shares																		
ST debt securities																		
LT debt securities																		
Financial derivatives																		
Other investment																		

6 - Adjustment procedures

- **EO = FA - (CA+KA)**
- **EO ex ante > 0**
 - To reduce net financial account transactions
 - To reduce T1, T2 (A)
 - To increase T3, T4 and T5 (L)
- **EO ex ante < 0**
 - To increase net financial account transactions
 - To increase T1, T2 (A)
 - To reduce T3, T4 and T5 (L)

6 - Adjustment procedures

- Position (previously validated) usually left unchanged
- Adjustment on Transactions
 - and therefore on other Volume Change
- For $i = 1$ to 5 :
 - $Pos_{i,t} = Pos_{i,t-1} + Tr_{i,t} + Fxi_{i,t} + Pri_{i,t} + OVC_{i,t}$
 - $Pos_{i,t} = Pos_{i,t-1} + Tr^*_{i,t} + Fxi_{i,t} + Pri_{i,t} + (OVC_{i,t} + Tri_{i,t} - Tr^*_{i,t})$
 - $OVC^*_{i,t} = OVC_{i,t} + Tr_{i,t} - Tr^*_{i,t}$
 - Large OVC undesirable --> $|OVC^*_{i,t}| < |OVC_{i,t}|$
- To sum up :
- From $(Tr_{1,t}, \dots, Tr_{5,t})$ to $(Tr^*_{1,t}, \dots, Tr^*_{5,t})$
 - $|EO^*_{t-1}| < |EO_t|$
 - $|OVC^*_{1,t}| < |OVC_{1,t}|, \dots, |OVC^*_{5,t}| < |OVC_{5,t}|$

7 - Conclusion

- «Objective» external statistics quality issues
 - Require bold reactions from official statisticians
- Luxembourg financial industry
 - Large, diversified and open
 - → Challenging b.o.p./i.i.p. compilation
 - Harmonised survey strategy
 - Sectoral analysis
 - Monitoring of flow/stock consistency
 - Reducing errors and omissions
 - Monitoring of cross border consistency
 - Shared micro data
 - At European level Eurostat / ECB
 - Global Legal Entity Identifier in the medium run

7 - Conclusion

Thank you for your attention !

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