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Risks and Spillovers: Use of National Balance Sheet Data

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Why National Balance Sheets matter?

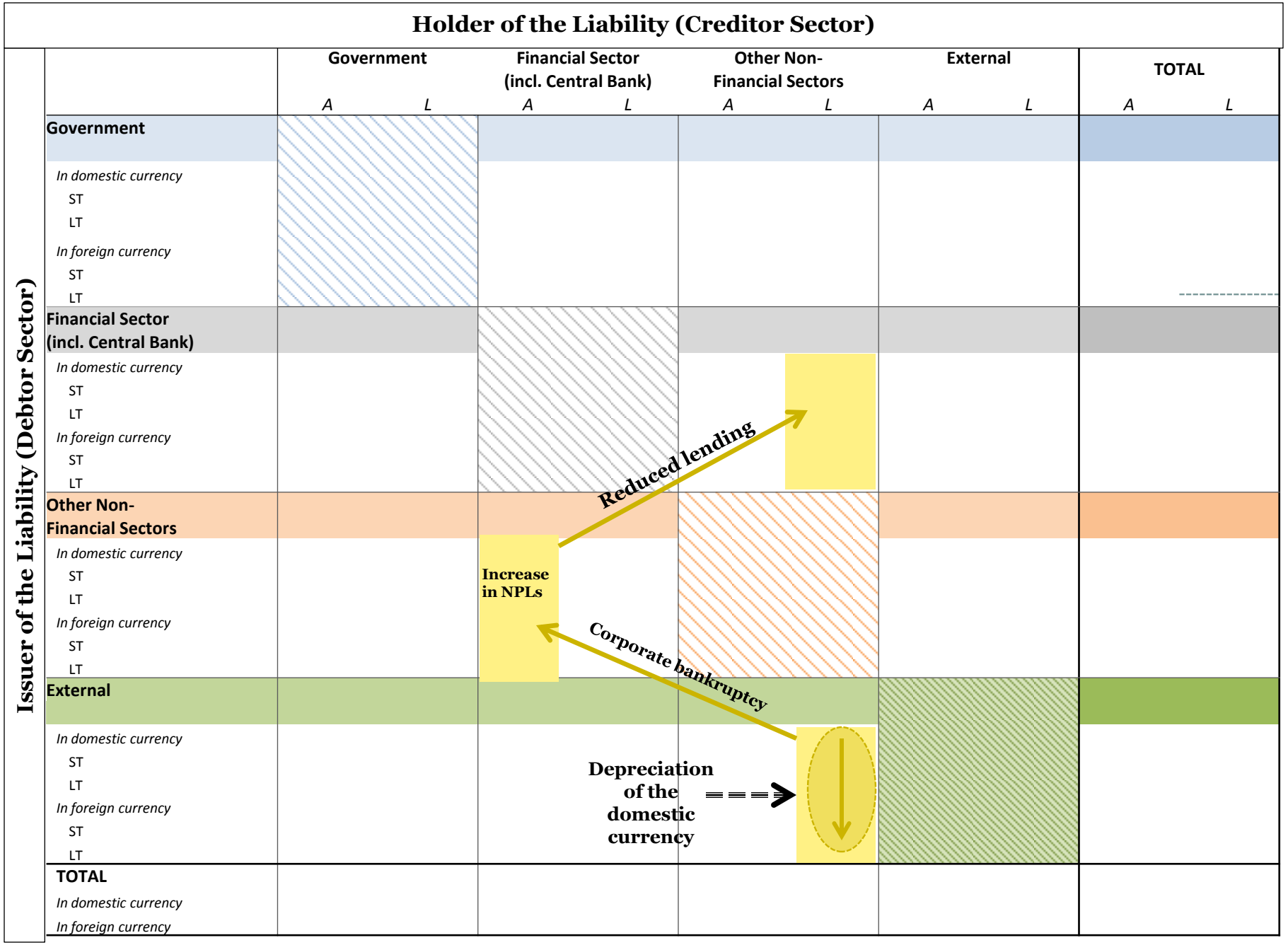
"National balance sheet analysis, examining vulnerabilities in all sectors individually and in aggregate, could have made a difference to preventing the global financial crisis."

Sir Paul Tucker, Former BOE Deputy Governor, from the 2014 TSR External Study on Risks and Spillovers.

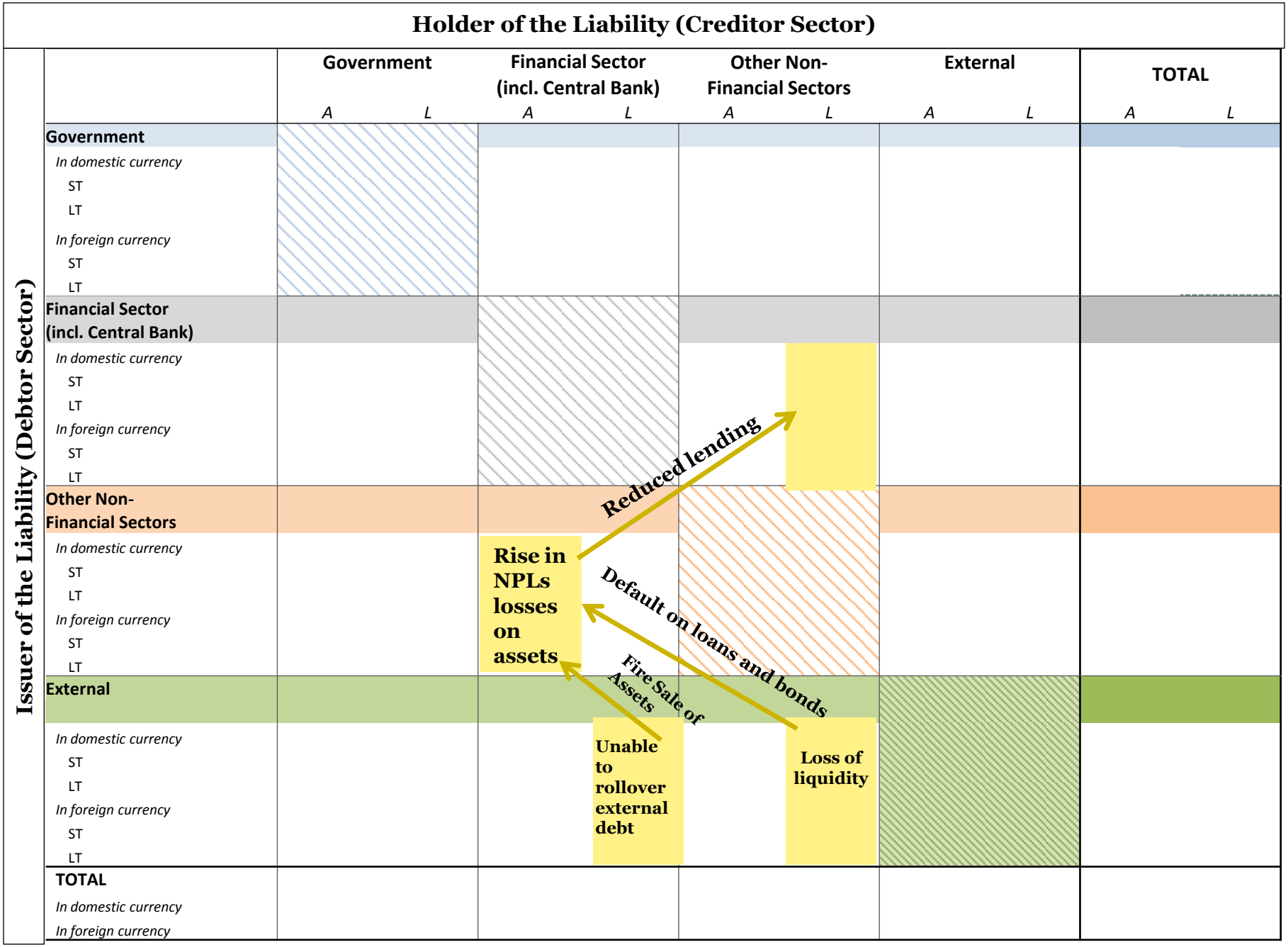
What is a National Balance Sheet? And, how do we Analyze it?

- The NBS: a network of interlinked sector balance sheets
  - Government, central bank, banks, NBFIs, corporates and households
  - These sum to the NBS: external asset and liability position vs. ROW
- The balance sheet matrix: a tool to analyze key risks
  - FX risk (i.e. currency mismatch in sector A & L positions)
  - Liquidity risk (i.e. maturity mismatch – a failure to refinance debt)
  - Credit risk (i.e. cut in value of assets or contingent liability materializing)
- Balance sheet analysis (BSA) assesses changes in A&L positions and impact of shocks across sectors – gives risk indicators plus scenarios

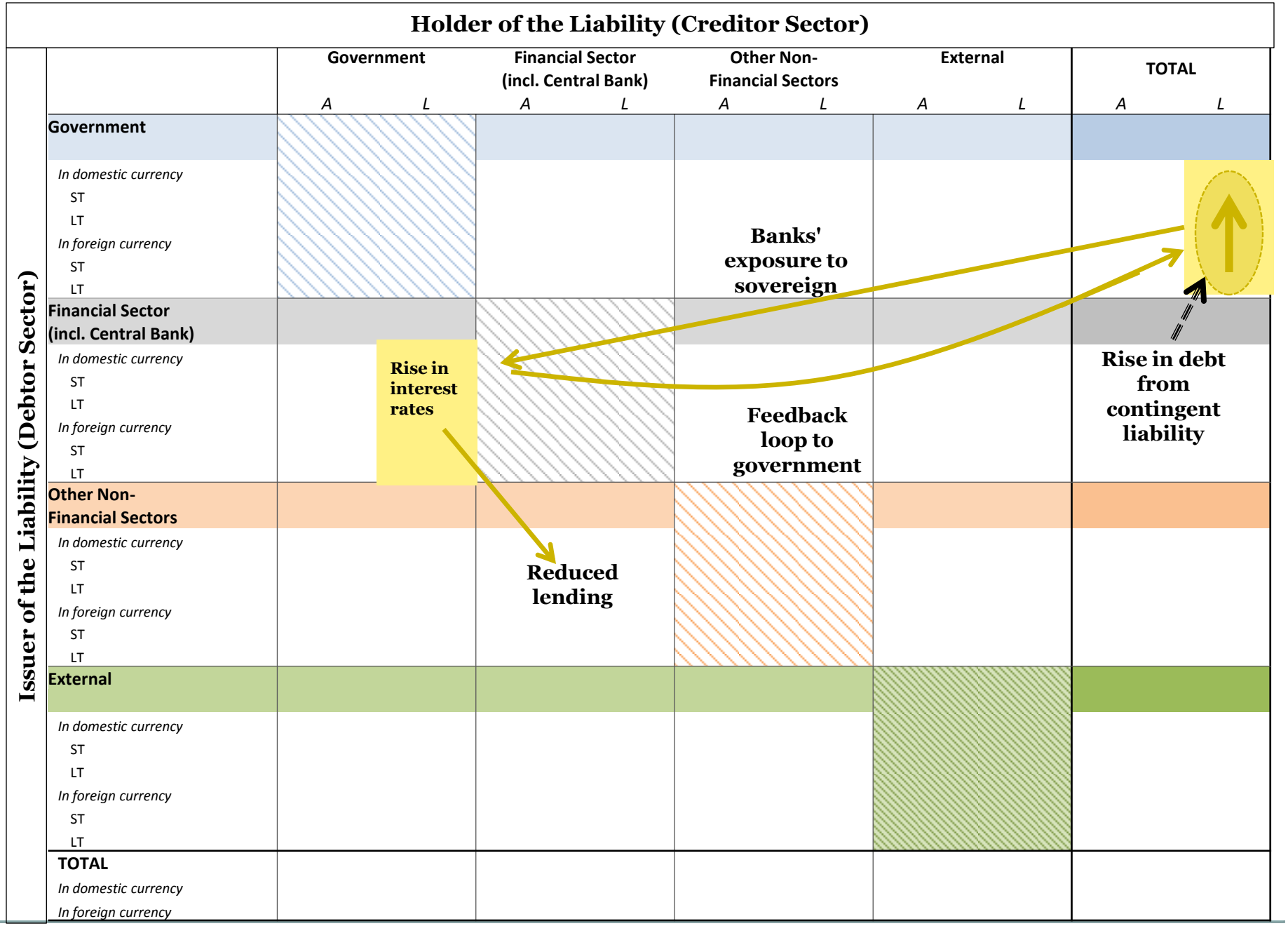
(Example 1: FX shock-corporates borrow in FX)



(Example 2: liquidity shock)



(Example 3: contingent liabilities materialize)



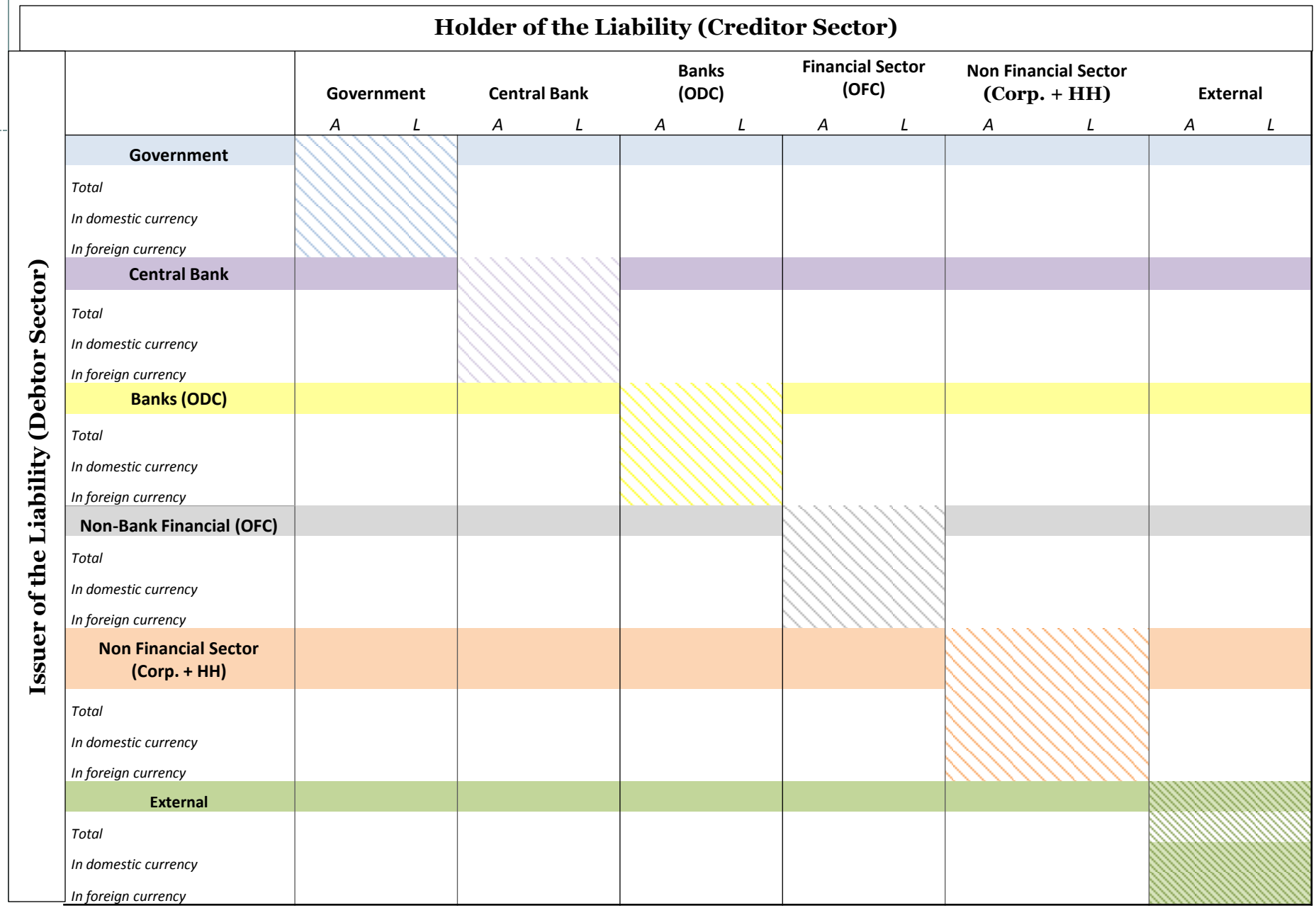
What has changed to make BSA more feasible now?

- BSA developed after Asia crisis: not widely used due to data gaps
- The 2008 crisis focused on balance sheets – but for individual sectors, not linkages, as data sources inconsistent
  - The GFSR analyzed bank deleveraging using bank accounting data
  - Programs relied on Debt Sustainability Analysis using debt issuance data
- Initiatives to address data gaps making deeper analysis possible
  - IMF/FSB/BIS/G20 Data Gaps Initiative
  - IMF reporting systems: SRF, GFS and IIP collect consistent balance sheet data

How will the BSA be integrated into IMF surveillance?

- Triennial Surveillance Review mainstreams BSA:
  - Deepening analysis of risks and spillovers
  - More tailored and expert policy advice for countries
  - Improving policy cooperation and evenhandedness
- TSR proposes reviving and adapting BSA
  - Desks monitor balance sheet vulnerability indicators (FX mismatch)
  - Trace domestic or external shocks across sectors in BSA matrix
- Strategy: develop easy to use tools – the BSA matrix
  - Start with basic sector disaggregation possible with IMF data and expand

Balance Sheet Matrix (Expanded)



To what extent is BSA possible with available data?

- Matrix constructed with balance sheet data from three IMF reporting systems
  - SRF form: balance sheet data for banks, OFC, central banks
  - GFS form: government balance sheet data
  - IIP form: external asset and liabilities
- Each defines bilateral balance sheet linkage to other sectors
- Corporate and household data not collected
  - Accounting identity allows these data to be estimated using IMF data

SRF - Based | IIP-Based

Indonesia Example

GFS-Based | BS Identity

(Trillions of Rupiah)

Holder of the Liability (Creditor Sector)

Issuer of the Liability (Debtor Sector)

	Government		Central Bank		Banks (ODC)		Financial Sector (OFC)		Non Financial Sector (Corp. + HH)		External		TOTAL	
	A	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*
Government														
Total			351	52	262	188	0	0	417	1,370	1,124	7	2,154	1,617
In domestic currency			351	30	243	183	0	0						
In foreign currency			0	22	19	5	0	0						
Central Bank														
Total	52	351			763	3	0	0	2	6	67	1,155	884	1,516
In domestic currency	30	351			685	3	0	0	0	6	0	0	716	361
In foreign currency	22	0			78	0	0	0	2	0	33	1,092	135	1,092
Banks (ODC)														
Total	188	262	3	763			253	175	2,881	2,733	484	115	3,809	4,049
In domestic currency	183	243	3	685			231	141	2,427	2,300	43	3	2,887	3,371
In foreign currency	5	19	0	78			22	34	454	434	166	115	646	680
Non-Bank Financial (OFC)														
Total	0	0	0	0	175	253			44	299			219	552
In domestic currency	0	0	0	0	141	231			44	241	17	0	202	472
In foreign currency	0	0	0	0	34	22			0	58	70	5	104	85
Non Financial Sector (Corporate + Household)														
Total	417	1,370	6	2	2,733	2,881	299	44			1,703	383	3,728	6,112
In domestic currency			6	0	2,300	2,427	241	44						
In foreign currency			0	2	434	454	58	0						
External														
Total		915	1,092	33	118	209	5	87	383	1,703			1,660	3,377
In domestic currency			0	0	3	42	0	17						
In foreign currency			1,092	33	115	166	5	70						
TOTAL	1,617	2,154	1,453	851	4,051	3,533	557	306	3,728	6,112	3,377	1,660		
In domestic currency			361	716	3,371	2,887	472	202						
In foreign currency			1,092	135	680	646	85	104						

How does data limit the BSA? And, what can be done?

- Around thirty countries report all needed data
  - Biggest gap: data on non-bank financial institutions (OFCs)
- Countries can support BSA by reporting all data on IMF forms
  - EU area countries that collect OFC data do not report them to the IMF yet
- The BSA matrix is useful for surveillance when data are incomplete
  - In many EMs, OFC balance sheets are small and can be ignored
  - Gaps in can be filled from national sources
- Matrix a starting point: expand with data from national sources
  - Estimate for non financial sector replaced by national corporate/HH data

Balance Sheet Matrix (with Corporate and Households separated)

Holder of the Liability (Creditor Sector)

Issuer of the Liability (Debtor Sector)

	Government		Central Bank		Banks (ODC)		Other Financial Corporation (OFC)		Corporate Sector		Household Sector		External	
	A	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*
Government														
Total														
In domestic currency														
In foreign currency														
Central Bank														
Total														
In domestic currency														
In foreign currency														
Banks (ODC)														
Total														
In domestic currency														
In foreign currency														
Non-Bank Financial (OFC)														
Total														
In domestic currency														
In foreign currency														
Non Financial Sector (Corp.)														
Total														
In domestic currency														
In foreign currency														
Non Financial Sector (HH)														
Total														
In domestic currency														
In foreign currency														
External														
Total														
In domestic currency														
In foreign currency														

What challenges face users and compilers?

- To use BSA to identify balance sheets risks and conduct scenarios a new, easy-to-use tool – the BSA Matrix – needs to be developed

- Data has improved to where BSA feasible but data gaps still limit analysis: there should be no let up in efforts to fill them

The future: A Global Flow-of-Funds analysis

- TSR: GFF matrix would show spillover channels between NBS
- The IMF, Fed, BOE, BOJ and ECB constructed a GFF matrix
  - A proof-of-concept only: data needed for full matrix made it impractical
- Construct partial GFF matrix to analyze financial spillovers
  - IIP, BIS IBS and CPIS data give cross country bilateral financial linkages
- Example: GFF matrix mapping shocks between country sectors

Global Flow of Funds: Bilateral Cross-Border Exposures between Country Sectors

(Example: Contingent Liability Shock in Country B → Liquidity Risk in Country A)

A= Assets, L = Liabilities, DC = Domestic Currency, FC = Foreign Currency

Country A: Holder of the External Liability (Creditor Sector)

Country B: Issuer of the External Liability (Debtor Sector)

	Government		Financial Sector (incl. Central Bank)		Other Non-Financial Sectors		External		TOTAL	
	A	*L*	*A*	*L*	*A*	*L*	*A*	*L*	*A*	*L*
Government										
Assets										
In Domestic Currency										
In Foreign Currency										
Liabilities										
In Domestic Currency										
In Foreign Currency										
Financial Sector (incl. Central Bank)										
Assets										
In Domestic Currency										
In Foreign Currency										
Liabilities										
In Domestic Currency										
In Foreign Currency										
Other Non-Financial Sectors										
Assets										
In Domestic Currency										
In Foreign Currency										
Liabilities										
In Domestic Currency										
In Foreign Currency										
External										
Assets										
In Domestic Currency										
In Foreign Currency										
Liabilities										
In Domestic Currency										
In Foreign Currency										
TOTAL										
In Domestic Currency										
In Foreign Currency