



Risk Analysis of Financial Institution Intermediation Through National Financial Account and Balance Sheets: Evidence from Indonesia



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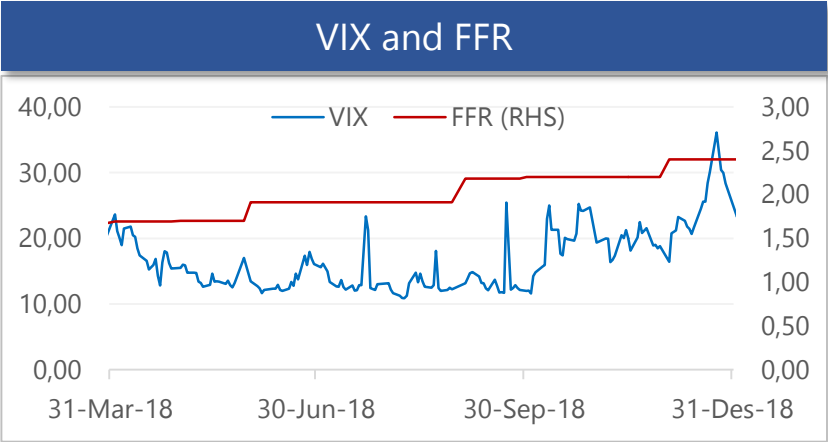
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Background

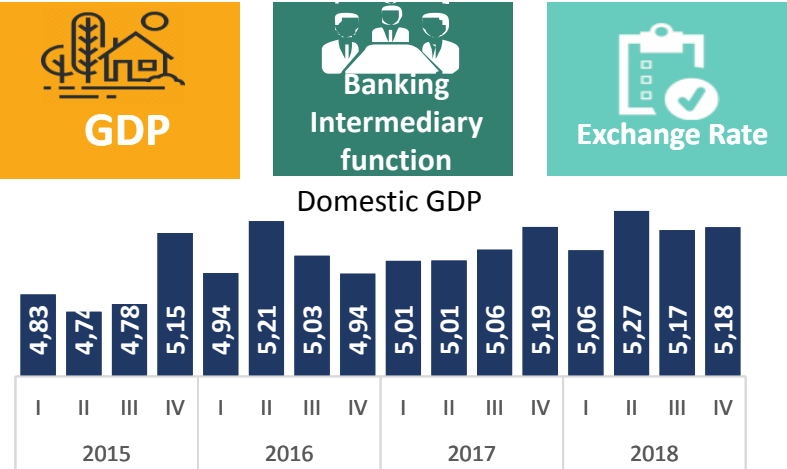
Global economic growth slowed down to 3.7% in 2018 from 3.8% in 2017.

Global

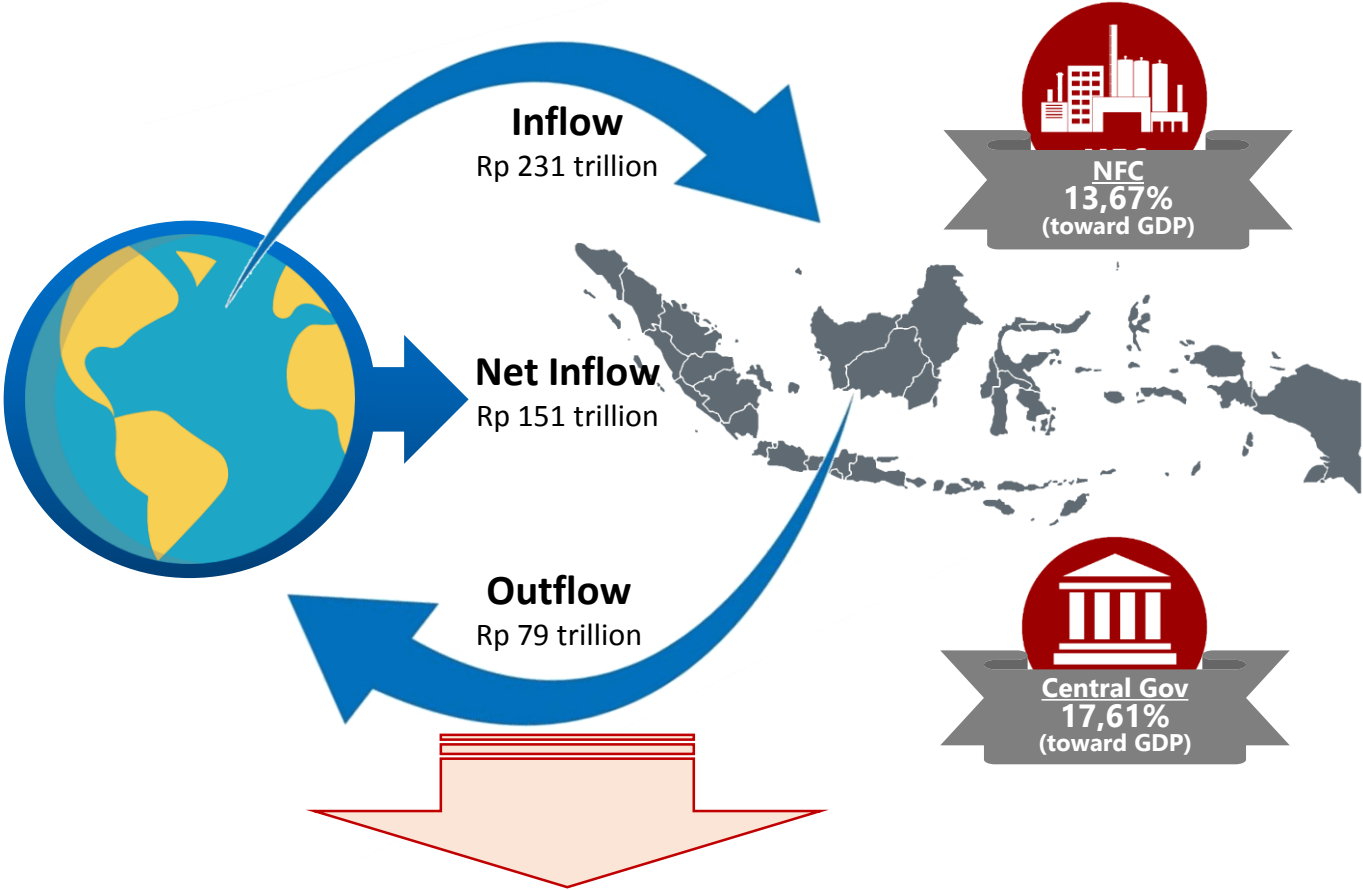


On the other hand, financial system stability has been maintained as the bank intermediation function improves and the banking industry effectively contains credit risk.

Domestic



At the end of 2018, the deceleration of global uncertainty, supported by maintained domestic economic performance led to an increase in foreign capital inflow into the domestic economy



leads to an increase of external risks and future capital reversals



Research Purpose and Limitation of Study

Research Purpose

This study provides a deeper analysis of potential risks arising from financial institutions under capital inflow condition and how they are interconnected to other sectors, how the identification of risk-based balance sheets is and whether the exchange rate depreciation and capital outflow put effects on a corporate sector balance sheet.

Conveys risk analysis of the intermediary function of financial institutions especially under capital inflow condition using National Financial Account and Balance Sheets (NFABS) approach.

Contribution

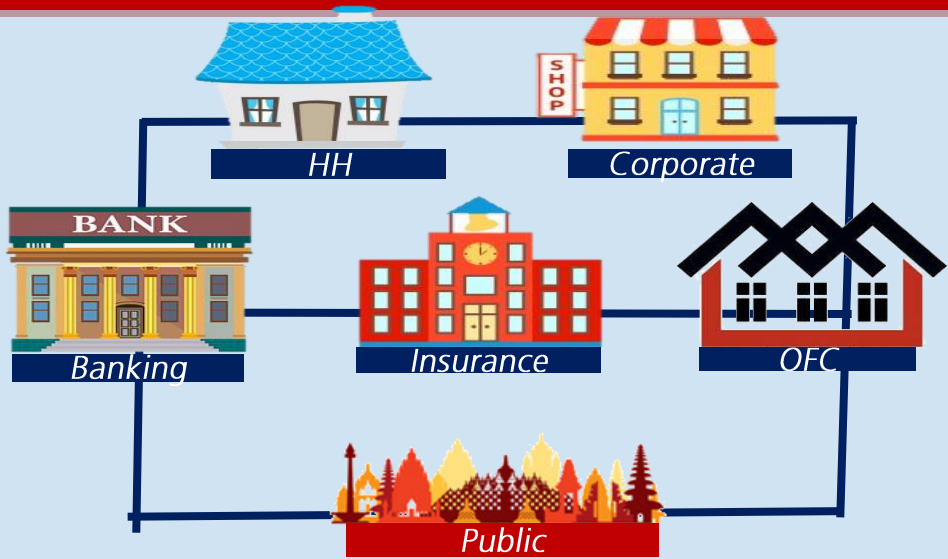
Limitation

Focuses on analyzing the financial transaction and excludes non-financial transaction such as non-financial assets. Therefore, it does not provide a complete picture of the net worth of each sector



Literature Review

- ❑ National and sectoral balance sheets provide an important stock perspective, which is particularly informative about aggregate wealth accumulation, financial structure, debt risks, and their transmission mechanisms, as well as other macroeconomic issues (Li, 2018).
- ❑ A study of the balance sheet contagion model conducted by Heipertz et al. (2019) shows that only the financial sectors of the economy propagate shocks on their security asset position, i.e. the banking sector, the insurance sector, and mutual funds.



	Central bank	Central gov't	State/Local Gov't	Public Nonfin Corp.	Other depository corp.	Other financial corp.	Nonfinancial corp.	Other residents	Nonresidents
Central bank		6%	0%	0%	1%	0%	0%	0%	-14%
Central gov't	-6%		0%	0%	12%	10%	0%	0%	13%
State and Local Gov't	0%	0%		0%	1%	0%	0%	0%	0%
Public Nonfinancial Corp.	0%	0%	0%		0%	0%	0%	0%	1%
Other depository corp.	-1%	-12.0%	-1%	0%		-3%	8%	2%	1%
Other financial corp.	0%	-10.1%	0%	0%	3%		-5%	3%	0%
Nonfinancial corp.	0%	0%	0%	0%	-8%	5%		0%	38%
Other residents	0%	0%	0%	0%	-2%	-3%	0%		0%
Nonresidents	14%	-12.5%	0%	-1%	-1%	0%	-38.1%	0%	

Source: National authorities, IMF

- ❑ Macro-financial links have had a significant impact on macroeconomic stability. Economic sectors are interlinked in which the performance of one sector would affect others (Claessens and Kose, 2018)
- ❑ One approach to identify macro-financial linkages is the BSA, which extracts information from annual data on sector-level balance sheets (IMF, 2016)
- ❑ The BSA matrix describes the net relationship of financial positions that occur amongst institutional sectors. The BSA Matrix is an exogenous change to macroeconomic variables (Loukoianova et al., 2016).



- ❑ The study of risk monitoring using the NABS approach was conducted by Allen et al (2002).
- ❑ By using balance sheet information, the three components of the financial risk can be identified and analyzed: capital structure risk, liquidity risk and insolvency risk (Blach, 2010).
- ❑ Allen et al. (2002) classified risk from balance sheet mismatches perspectives into four categories which are maturity mismatches, currency mismatches, capital structure problems, and solvency problems.
- ❑ Imam and Kohler (2010) also conducted a balance sheet vulnerability analysis during the shocks period.

- ❑ The financial sectors of the economy (banking, mutual fund, and insurance sector) are affected by balance-sheet contagion and are vulnerable to the foreign sector shocks, consistent with their substantial external asset positions (Heipertz et al., 2019).
- ❑ capital flows can lead to financial instability in the form of excessive credit growth, asset price pressures, in some extreme cases, banking have more crises even in countries with a floating exchange rate and an independent monetary policy (Agenor and Jia, 2015).
- ❑ Several factors are identified as determinants of capital inflows which are domestic interest rate and commodity prices.



Data Explanation

DATA SERIES

Financial Account and Balance Sheet Indonesia (FABSI) 2015Q1-2018Q4 provide by Statistics Department, Bank Indonesia

INSTRUMENTS

The interconnectedness of each sector will be identified based on eight financial instruments which are:



**Monetary
Golds & SDRs**



**Currency
& Deposits**



Debt Securities



Loans



Equity



**Insurance &
Pension Funds**

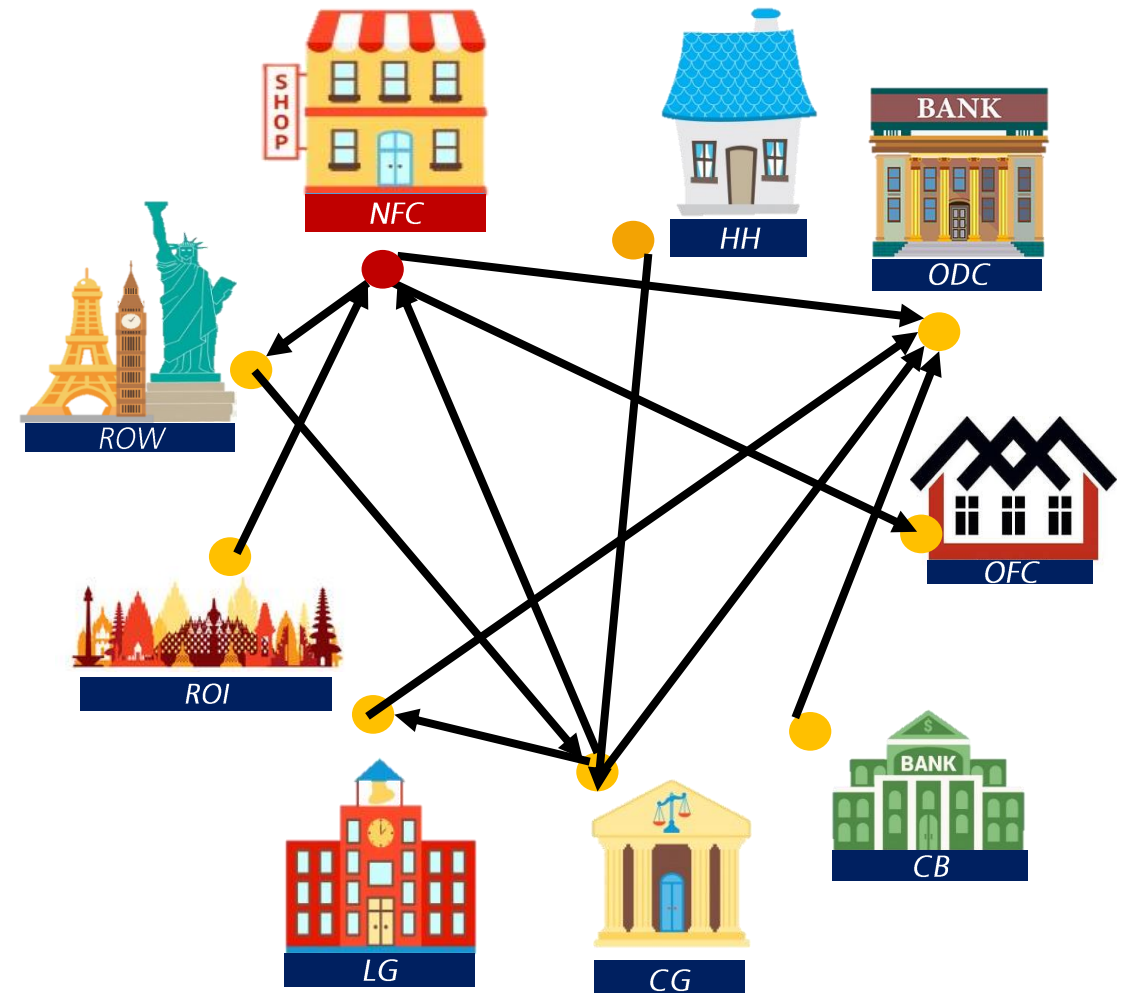


**Financial
Derivative**



**Other accounts
receivable/payable**

SECTORS





Analysis Method

Macrofinancial Linkages

Uses a network analysis approach to show the financial transaction flow and financial position of each economic sector at the time of global capital inflow

The analysis focuses on the movement of funds through the banking sector as a sector that carries out financial intermediaries to channel loans to the corporate sector and households

To figure out the movement of fund transaction, we use network analysis created by using NodeXL.

Risk Analysis

List of NFABS Variables	Code
Total Asset	(A)
Non Financial Asset	(B)
Fixed Asset	(C)
Total Financial Asset	(D)
Foreign Currency Asset	(E)
Liquid Asset*	(F)
External Financial Asset	(G)
Total Liabilities	(I)
Foreign Currency Liabilities	(J)
Short Term Liabilities*	(K)
External Liabilities	(L)
Debt (Total Liability - Equity and investment fund shares)	(M)
Equity and investment fund shares/units	(N)
Deposits	(O)
Foreign Currency Deposits	(P)
Loans	(Q)
Foreign Currency Loans	(R)

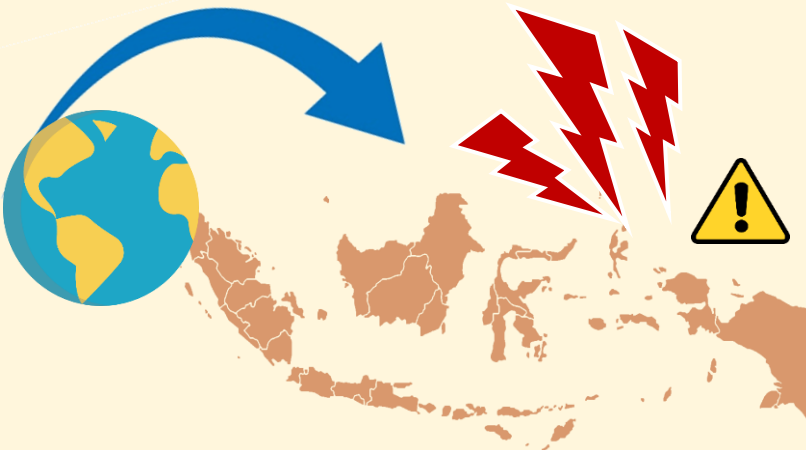
Risk Indicators*	Formula
Credit Risk	
Debt to Asset Ratio (DAR)	(M) / (A)
Debt to Equity Ratio (DER)	(M) / (N)
Debt Financial Assets Ratio	(M) / (D)
Debt to Liabilities	(M) / (I)
External Risk	
External Liabilities to Financial Assets	(L) / (D)
Market Risk	
FC Liabilities to Liabilities	(J) / (I)
FC Liabilities to Financial Assets	(J) / (D)
Liquidity Risk	
Liquid Assets to Total Assets	(F) / (A)
Loans to Liabilities	(Q) / (I)
Solvency Risk	
Liabilities to Financial Assets	(I) / (D)
Liabilities to GDP	(I) / GDP**

*All indicators are calculated by using Indonesia NFABS data - Q4 2018

**GDP Indonesia per Q4 2018 as IDR 14.387 trillions

Sensitivity Analysis

Refers to the analysis of macro-financial linkages in Indonesia by the IMF (2016) using the BSA Matrix



1st Scenario



Rp
Depreciation
20%

2nd Scenario



Rp
Depreciation
20%

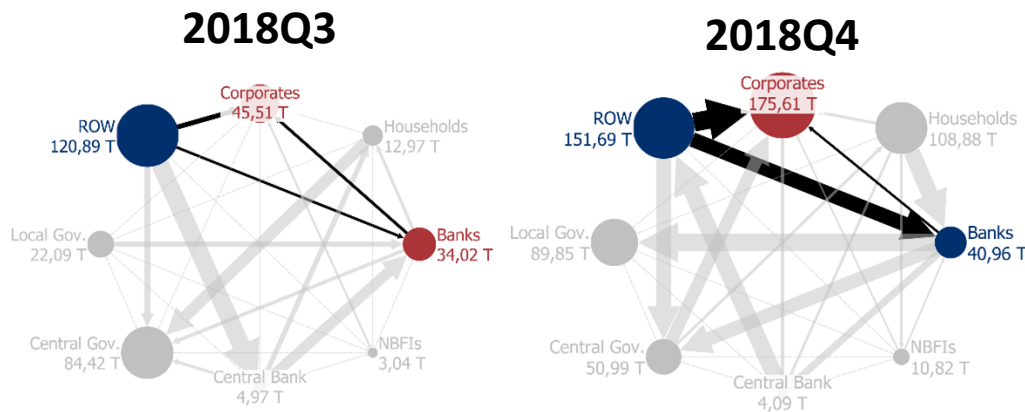
Capital
Reversal
10%



Results : Macro-Financial Linkage, Capital Flows, and Intermediation

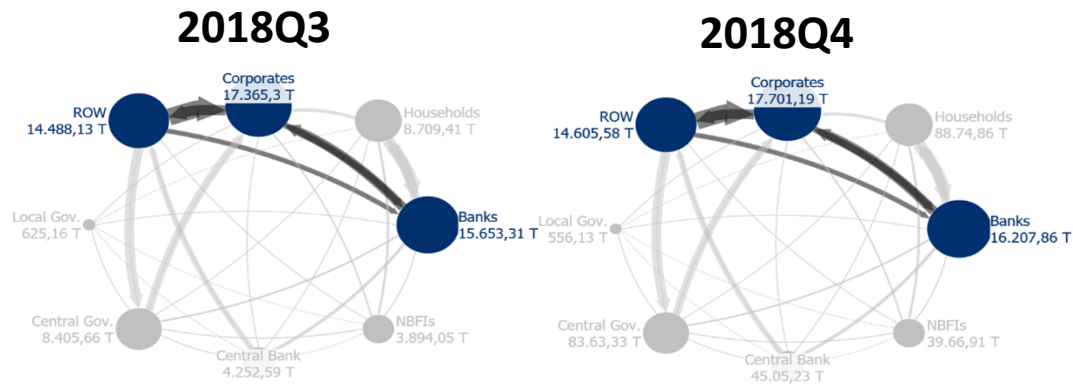
Network Analysis of Transaction

- ❑ Transaction flow of ROW increased
- ❑ ROW plays a dominant role as a funding source for domestic as well as boost up banks' intermediary capacity



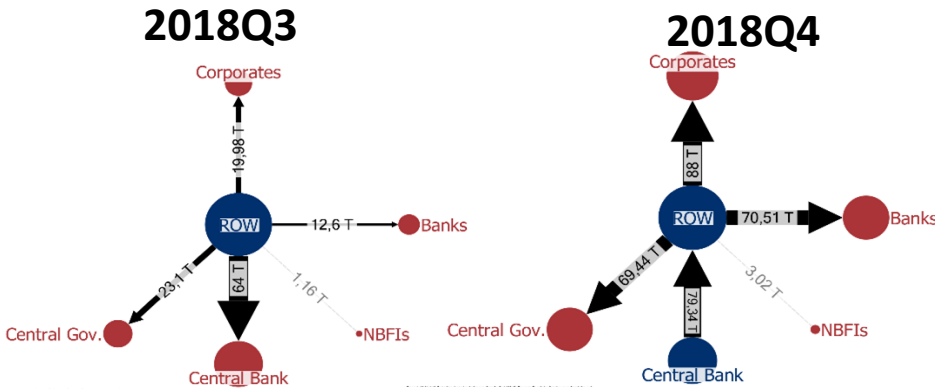
Network Analysis of Position

The dynamic of a transaction during the fourth quarter of 2018 have a high impact on the financial position



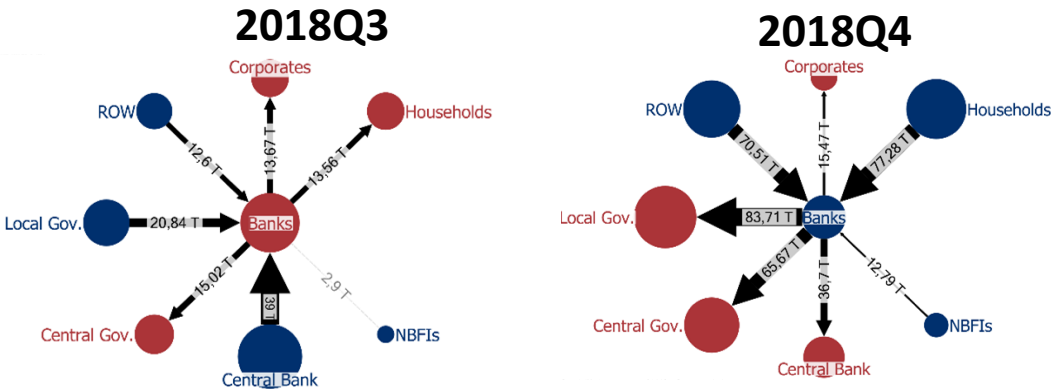
ROW Transaction

ROW's inflow to bank significantly increased



Bank Transaction

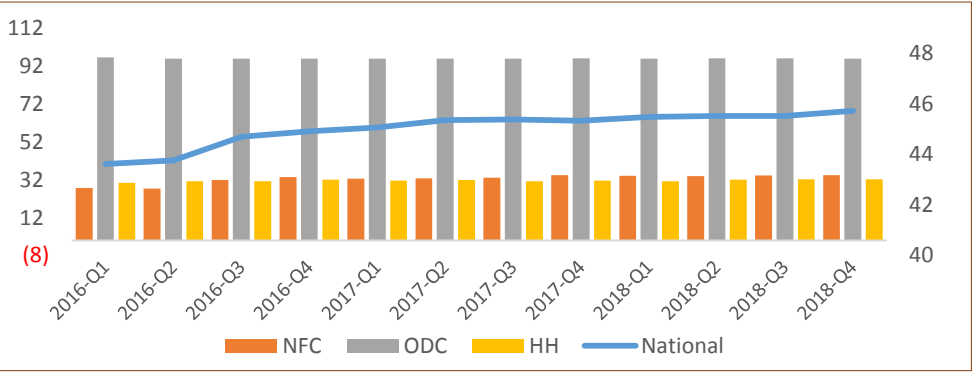
The banking sector also has high linkage with other sectors



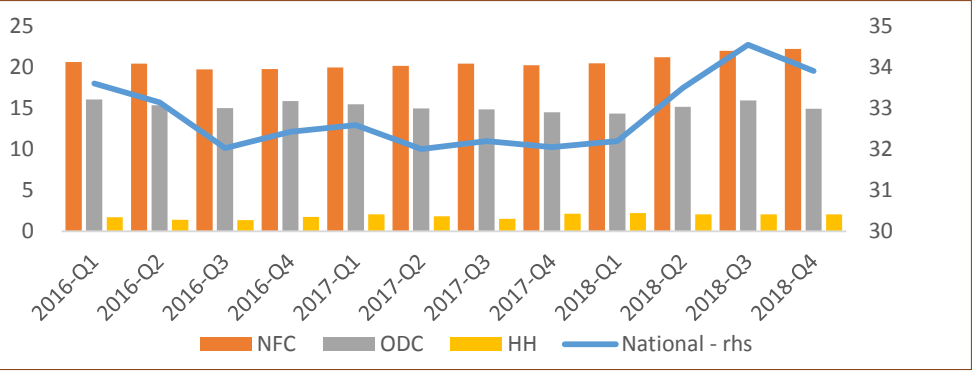


Results : Risk Profile Analysis

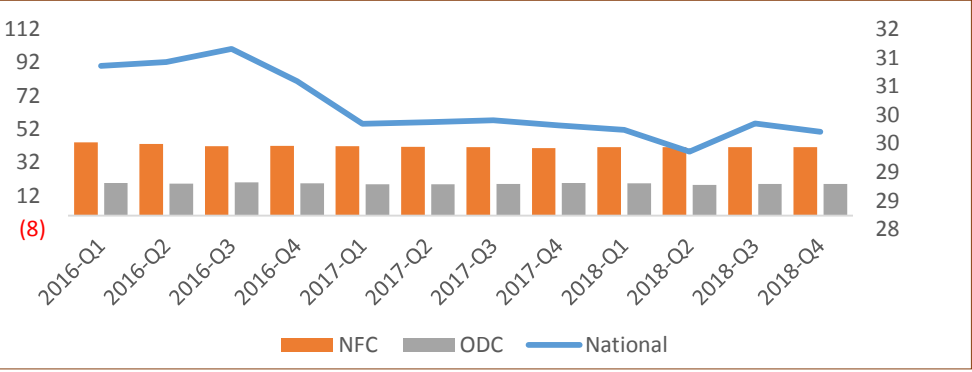
Liquidity Risk



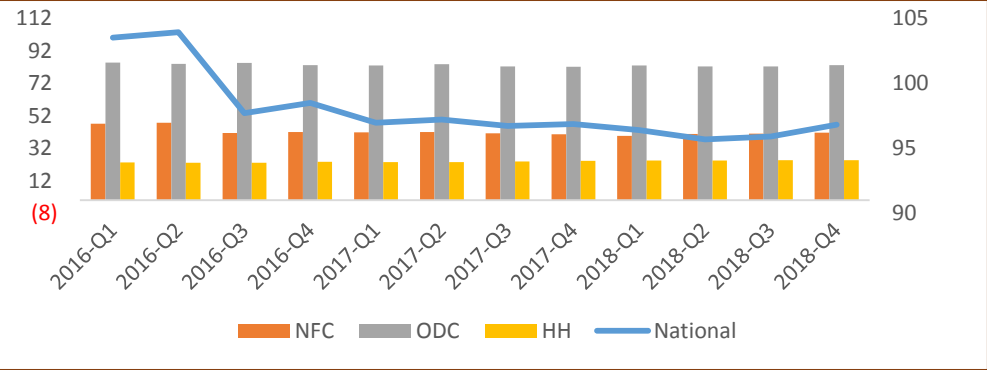
Market Risk



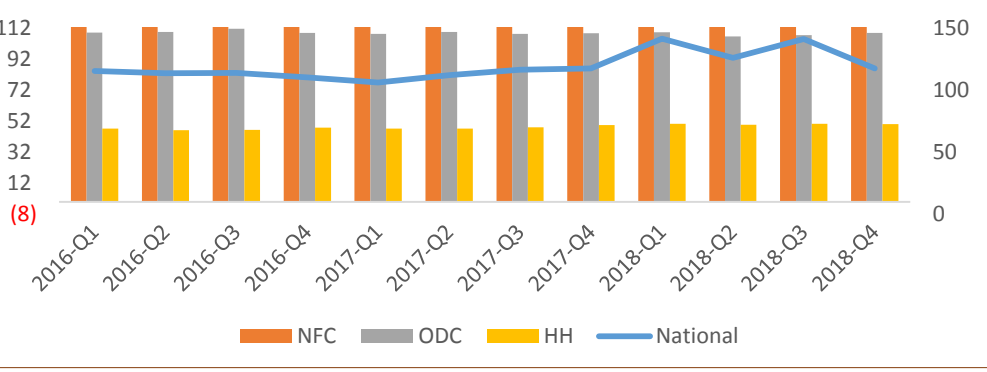
External Risk



Credit Risk



Solvency Risk





Results : Sensitivity Analysis*

Shows the implications of macro parameters changing to national economic sector performance

BSA Matrix of Financial Position in 2018Q4 Before Shock (% of GDP)

		Holder of Liability (Creditor Sector)							
		Corporates	Household	Banking	NBFIs	Central Bank	Central Gov.	Local Gov.	ROW
Issuer of the Liability (Debtor Sector)	TOTAL	-42,70%	19,85%	-4,63%	2,24%	-0,55%	-8,91%	3,08%	31,61%
	Corporates		7,71%	5,46%	3,64%	-1,94%	12,69%	1,5%	13,68%
	Household	-7,71%		-5,76%	-3,40%	-2,04%	-1,06%	0,12%	0,00%
	Banking	-5,46%	5,76%		1,44%	-7,35%	-0,49%	1,37%	9,37%
	NBFIs	-3,64%	3,40%	-1,44%		-0,10%	-2,49%	0,00%	2,02%
	Central Bank	1,94%	2,04%	7,35%	0,10%		0,17%	0,02%	-11,08%
	Central Gov.	-12,69%	1,06%	0,49%	2,49%	-0,17%		0,10%	17,62%
	Local Gov.	-1,46%	-0,12%	-1,37%	0,00%	-0,02%	-0,10%		0,00%
	ROW	-13,68%	0,00%	-9,37%	-2,02%	11,08%	-17,62%	0,00%	

- Scenario 1: corporate liabilities fall from -42.70% (to GDP) to -40.87% (to GDP), corporate liabilities to external slumped from -13.68% (to GDP) to -11.90% (to GDP). A decrease in external liabilities → corporate sector has a fairly good resilience towards the pressure of the rupiah depreciation.
- Scenario 2: The net external assets to the domestic sector decline from 31.61% of GDP to 26.99% of GDP, driven by a significant reduction in net external assets to the NFC from 13.68% to GDP to 8.60% of GDP.
- capital reversal → look for domestic financing alternatives. Assumed that financing is obtained from the banking sector → increase financial assets of bank to corporate increases from 5.46% to GDP to 8.90% of GDP and from now on, increases the bank's risk exposure.

Scenario 1

Effects of 20% Exchange Rate Depreciation

		Holder of Liability (Creditor Sector)							
		Corporates	Household	Banking	NBFIs	Central Bank	Central Gov.	Local Gov.	ROW
Issuer of the Liability (Debtor Sector)	TOTAL	-40,87%	19,85%	-4,42%	1,97%	1,26%	-11,09%	3,02%	30,28%
	Corporates		7,67%	5,60%	3,72%	-1,91%	12,45%	1,4%	11,90%
	Household	-7,67%		-5,92%	-3,34%	-2,00%	-1,04%	0,12%	0,00%
	Banking	-5,60%	5,92%		1,36%	-7,51%	-0,60%	1,34%	9,52%
	NBFIs	-3,72%	3,34%	-1,36%		-0,10%	-2,44%	0,00%	2,31%
	Central Bank	1,91%	2,00%	7,51%	0,10%		0,24%	0,02%	-13,04%
	Central Gov.	-12,45%	1,04%	0,60%	2,44%	-0,24%		0,10%	19,60%
	Local Gov.	-1,44%	-0,12%	-1,34%	0,00%	-0,02%	-0,10%		0,00%
	ROW	-11,90%	0,00%	-9,52%	-2,31%	13,04%	-19,60%	0,00%	

Scenario 2

20% Exchange Rate Depreciation and 10% Capital Outflow

		Holder of Liability (Creditor Sector)							
		Corporates	Household	Banking	NBFIs	Central Bank	Central Gov.	Local Gov.	ROW
Issuer of the Liability (Debtor Sector)	TOTAL	-40,87%	19,85%	-4,42%	1,97%	1,26%	-11,09%	3,02%	30,28%
	Corporates		7,67%	5,60%	3,72%	-1,91%	12,45%	1,4%	11,90%
	Household	-7,67%		-5,92%	-3,34%	-2,00%	-1,04%	0,12%	0,00%
	Banking	-5,60%	5,92%		1,36%	-7,51%	-0,60%	1,34%	9,52%
	NBFIs	-3,72%	3,34%	-1,36%		-0,10%	-2,44%	0,00%	2,31%
	Central Bank	1,91%	2,00%	7,51%	0,10%		0,24%	0,02%	-13,04%
	Central Gov.	-12,45%	1,04%	0,60%	2,44%	-0,24%		0,10%	19,60%
	Local Gov.	-1,44%	-0,12%	-1,34%	0,00%	-0,02%	-0,10%		0,00%
	ROW	-11,90%	0,00%	-9,52%	-2,31%	13,04%	-19,60%	0,00%	

*The sensitivity analysis framework used in this report refers to the analysis of macro-financial linkages in Indonesia by the IMF (2016) using the BSA net financial position



Conclusions

- ❑ Macro-financial linkage analysis shows the important role of ROW to the domestic sectors represented by transaction inflows, mostly to the corporate sector. Transaction flows from ROW to the banking sector give impact to the increasing of intermediary's capacity.
- ❑ Risk analysis shows that the risk profile of domestic and sectoral financial imbalances indicators are relatively under control. Credit risk and external risk must be concerned when it comes to corporates, while for the banking sector, an increase in foreign financial liabilities has the potential to increase external risk and market risk amid increased the credit risk where increased growth in liabilities is greater than the increase in assets.
- ❑ Sensitivity analysis shows that combination of exchange rate depreciation and capital outflow will decrease net financial assets of ROW and increase banking's net financial assets.

THANK YOU

