

Credit creation and deleveraging

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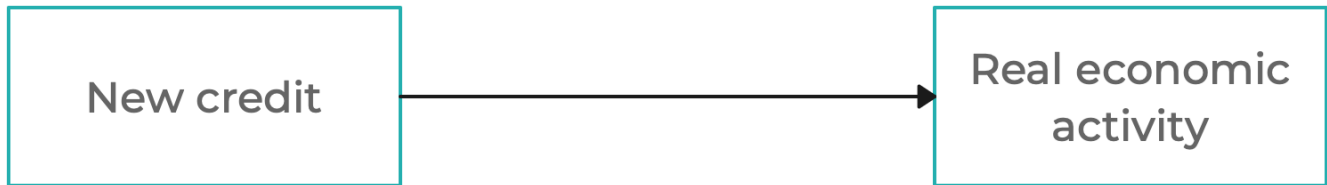
Workshop repository:

<https://github.com/gimm-institute/july-2023-rwanda-workshop.git>

Causality between credit and macro activity

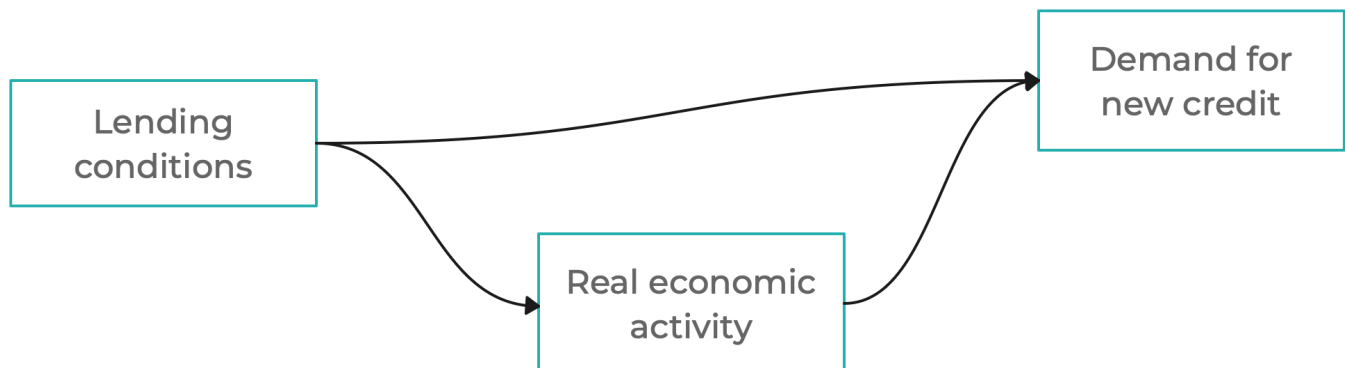
Reduced-form approach

Provides little insight into demand and supply forces in the credit market



Semistructural approach

Motivated by insights from DSGE models, provides more insight. Our approach



Lending conditions

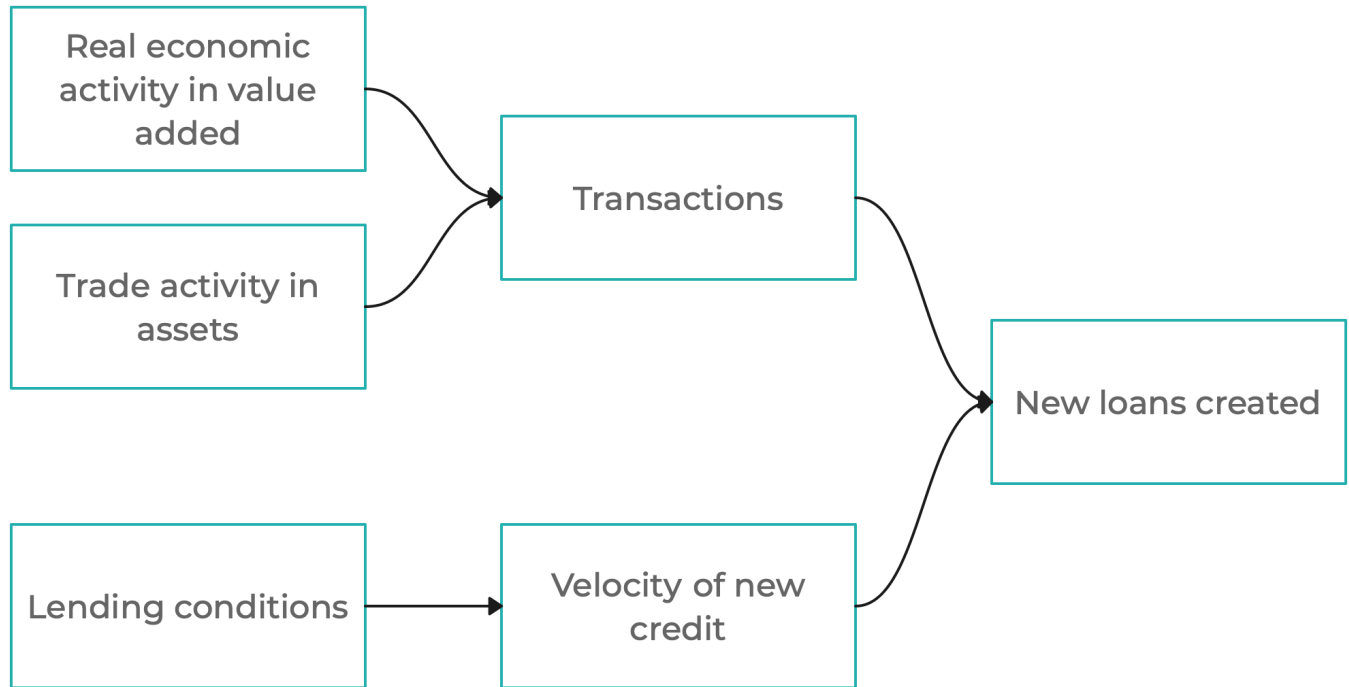
Real-world lending conditions comprise

- price conditions: lending rates
- non-price conditions: collateral requirements, insurance requirements, quantitative rationing

In the model, the index of overall lending conditions is calculated as follows:

1. First, a hypothetical (unobservable) level of lending rates that would cover all lending costs and (expected) risks is calculated
2. This hypothetical level of full coverage lending rates is then split into price lending conditions (corresponding to the observed market lending rates) and non-price conditions (the remaining part)
3. The explicit price lending conditions determine the interest income in bank profits/losses
4. The total lending conditions (price and non-price) affect the choices made by real economic agents (households, non-financial businesses, etc.)

Structure of credit creation process



Demand for new credit

New credit is demanded to finance current period's transactions

$$l_t^\Delta = vy_t \cdot trn_t \cdot \exp \varepsilon_{t,l\Delta}$$

where

- l_t^Δ is new credit
- vy_t is the inverse velocity of new credit
- trn_t is the value of all the transactions that need financing
- $\varepsilon_{t,l\Delta}$ is a shock to new credit

In the real world, current period's transactions are financed by combining new credit and money already existing (arising in credit creation in past periods).

Current transactions

Current period nominal transactions comprise new value added (consumption, investment, etc.) and trade in existing assets

$$trn_t = (1 - c_1) \cdot py_t \cdot y_t + c_1 \cdot py_t \cdot fwy_t$$

Inverse velocity of new credit

Process designed to stabilize the stock of bank loans to GDP ratio and bring in the impact of lending conditions and other factors:

$$\begin{aligned}vy_t &= vy_{ss} \\&- c_1 \cdot r_t^{\text{cond}} \\&+ c_2 \cdot \left(\left[\frac{l}{4ny} \right]_t - \left[\frac{l}{4ny} \right]_t^{\text{tnd}} \right) \\&+ \varepsilon_{t,vy}\end{aligned}$$

where

- r_t^{cond} is a measure of lending conditions as defined in [a5-interestRates.md](#)
- $\left[\frac{l}{4ny} \right]_t - \left[\frac{l}{4ny} \right]_t^{\text{tnd}}$ is the deviation of the credit to GDP ratio from its long-run sustainable trend

Deleveraging: Stocks and flows

Deleveraging is the process of reducing the amount of gross debt of non-financial agents (households, businesses).

The stock of outstanding loans can only be reduced through reductions in flows, i.e. new loans; simplified dynamics with no defaults and no foreign currency denomination:

$$l_t = (1 - \theta)l_{t-1} + l_t^\Delta$$

Reductions in new loans are triggered by tighter lending conditions and (hence) a slowdown in real economic activity