Figure 6 plots the density over realised values of 1 dollar face value of loans, and shows how the density shifts to changes in the default probability ε (left hand panel) or to changes in ρ (right hand panel). From (9), the c.d.f. of w is increasing in ε, so that higher values of ε imply a first degree stochastic dominance shift left for the asset realisation density. Since ε increases with expected dollar appreciation, exchange rates have a direct impact on the credit environment in our model.

2.2.3 Bank leverage

Banks are risk-neutral price takers with a fixed, exogenous endowment of own funds. Each bank chooses total lending to maximise the market value of equity, subject to two constraints. The first is the balance sheet identity at date 0, that lending is the sum of own funds and borrowed funds. The second constraint is a leverage constraint.

We solve the bank's problem in two steps. In the first step, we solve for leverage from a contracting problem. Then, risk-neutrality and price taking means that loan supply is the maximum lending consistent with the leverage constraint and the balance sheet identity. Finally, the loan rate r is solved from market clearing.

As noted by Merton (1974), the market value of debt is the difference between the notional value of debt and the implicit option value of default. The market value of equity is then given by

$$\begin{aligned} \text{Market value of equity} &= \text{Asset value} - \text{Debt value} \\ &= \text{Asset value } - \text{Notional debt } + \text{ Option value of default} \end{aligned}$$

The contract between the bank and its creditors addresses the moral hazard problem as in Adrian and Shin (2014) where the bank can opt for a portfolio of riskier loans that has lower expected value but a higher option value of default. We limit consideration to debt contracts only. The contract limits the bank's leverage and thereby caps the option value of default.

Formally, suppose that each regional bank has the binary choice between a portfolio of good loans and a portfolio of bad loans. Good loans have a probability of default ε and parameter $\rho > 0$. We denote the c.d.f. of one dollar's face value of good loans as $F_G(\cdot)$. Thus, F_G is given by (9).