Credit and Bankruptcy in a Temporary Equilibrium Model

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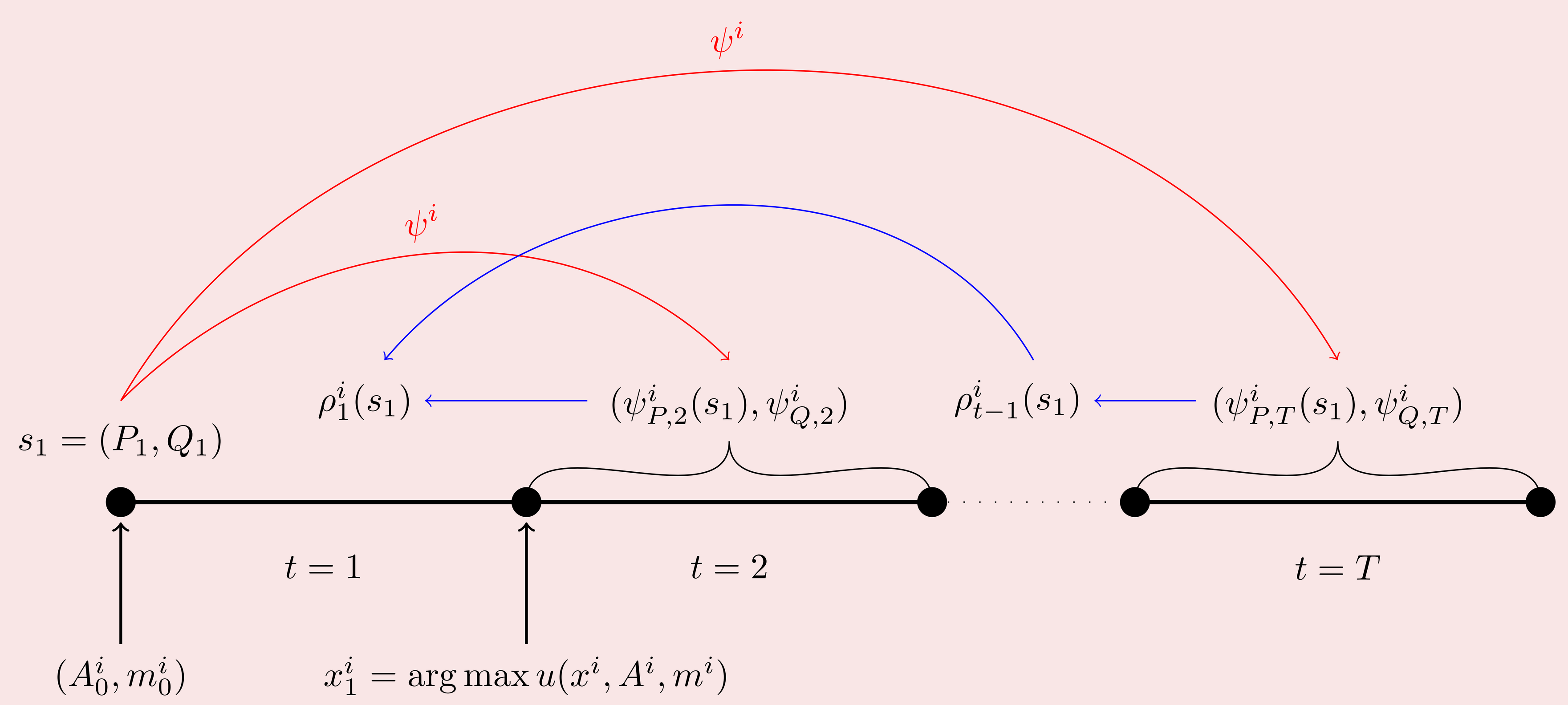
Abstract

In this paper, we consider a temporary general equilibrium model with bankruptcy as an extension of Eichberger(1989). The model provides a basic setting to analyze the relevance of monetary policy and financial chain-reaction bankruptcy, together with some necessary conditions for how to extend the bankruptcy model into a general dynamic framework.

Introduction

1. The private assets and monetary policy under bankruptcy
   - the problem of bankruptcy of state-owned companies in China
   - the central bank and the shadow bank
   - the problem of non-performing loans
   - Grandmond(1975), Eichberger(1989) etc.
2. the liquidation without penalty(transfer)
   - the limited liability which is provided by the Bankruptcy Act
   - the equity of liquidation rule which is un-chosen by any agent
   - the penalty(transfer) lead the welfare loss
   - Modica(1998), Geanakoplos(2005) etc

The Economy



Agent *i*' forecast system

Credit Scheme

$\psi^b_t(s_1) \leq \phi^i_t(s_1)$ for all $i \in I$;

$\rho^{i,j}_t(s_1) + \phi^j_{P,t+1}(s_1) \cdot e^i_t - \phi^j_{Q,t+1}(s_1) \cdot \rho^{i,j}_{t+1} \geq 0.$

Liquidation rule

an agent faces to bankruptcy if $-q^i_t \rho^{i,b}_t(s_1) + P_t \cdot e^i_t + \mathbf{1} \cdot A^i_{t-1} + m^i_{t-1} < 0$;

the liquidation rule assumed as $G^i_{t-1} = K_{t-1} \cdot {A^i_{t-1}}^+$, where

$$\kappa^i_{t-1} = \begin{cases} \frac{\min\{P_t \cdot e^i_t + m^i_{t-1} + G^i_{t-1} - Q_t \cdot \rho^{i,b}_t, \mathbf{1} \cdot {A^i_{t-1}}^-\}}{\mathbf{1} \cdot {A^i_{t-1}}^-} & \text{if } i \text{ bankrupts} \\ [0,1] & \text{others.} \end{cases}$$

Temporay Equilibrium

Consumer's Action

$(x^i_1, A^i_1, m^i_1) \in \Pr_1 \xi^i \equiv \arg\max\{u^i(x^i_1, \dots, x^i_T) | (x^i, A^i, m^i) \subset B^i(\psi^i(s_1), A^i_0, m^i_0, P_1, Q_1)\}$

Monetary Policy

$M^b_t - M^b_{t-1} = \mathbf{1} \cdot G^b_{t-1} - Q_t \cdot A^b_t$

Initial Financial

$i \in \bar{I} \equiv \{i \in I | {A^i_0}^- + m^i_0 \geq 0\}$ such as $\rho^i_1 < 0$

Temporary General Equilibrium

There exists a temporary general equilibrium in **current period** if $\bar{I} \neq \emptyset$.

Extension

- an overlapping model always satisfies ${A^i_t}^- + m^i_t \geq 0$ for some $i \in I$;
- the necessary condition of dynamic model

  $\sum_{i \in I} m^i_0 + \sum_{i \in I} {A^i_0}^- > 0$;

  $0 \geq \hat{\rho}^i_t > f_t(s_t)\rho^i_t$, where

$$f_t(s_t) = \begin{cases} \frac{\sum_{i \in I} m^i_{t-1} + \sum_{i \in I} {A^i_{t-1}}^-}{\sum_{i \in I} \rho^i_t} & \frac{\sum_{i \in I} m^i_{t-1} + \sum_{i \in I} {A^i_{t-1}}^-}{\sum_{i \in I} \rho^i_t} < 1 \\ 1 & \frac{\sum_{i \in I} m^i_{t-1} + \sum_{i \in I} {A^i_{t-1}}^-}{\sum_{i \in I} \rho^i_t} \geq 1. \end{cases}$$

- an monopoly agent i such as $\rho^i_t \geq \rho^i_{t-1}$, then

  the monopoly price $q^*_t = \frac{\rho^i_{t-1} - P^*_t \cdot \sum_{j \in I \setminus \{i\}} e^j}{\rho^i_t}$

  the price discount $\beta_t = \sum_{l \in L} {p^l_t}^{-1}$

Conclusion

- The credit scheme implies some un-chosen liquidation rule without penalty.
- There exists a temporary general equilibrium even if the bankruptcy chain-reaction occurs.
- A temporary general equilibrium can exit in dynamic model if there is at least one agent never face bankrupt at the beginning of each period.
- In dynamic framework, an equilibrium monetary policy must cover the liability lossing and forbearance lending, and prevents economic collapse.