Discussion on
"Policy in International Payment Systems with a Timing Friction"
by James T.E. Chapman

The Economics of Payments II

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Federal Reserve Bank of New York

Hiroshi Fujiki

Bank of Japan, IMES

(An usual disclaimer applies)

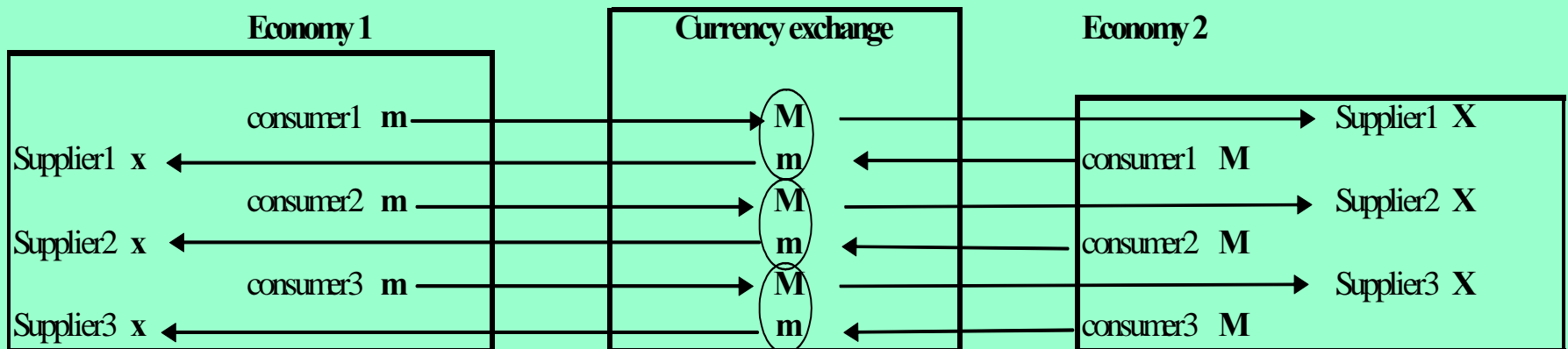# Three comments

I.   An important theoretical extension of the literature [Freeman (1996), Herandez-Verme (2004), and Fujiki (2003, 2006)]. It considers non-cooperative behaviors of central banks to deal with the friction due to the time zone gap without assuming gold standard system.

II.   What are the practical implications of the main result that "non-cooperative central banks do not achieve the optimal allocation"?

III.   Other institutions may relax the frictions due to time zone gap considered in this paper.
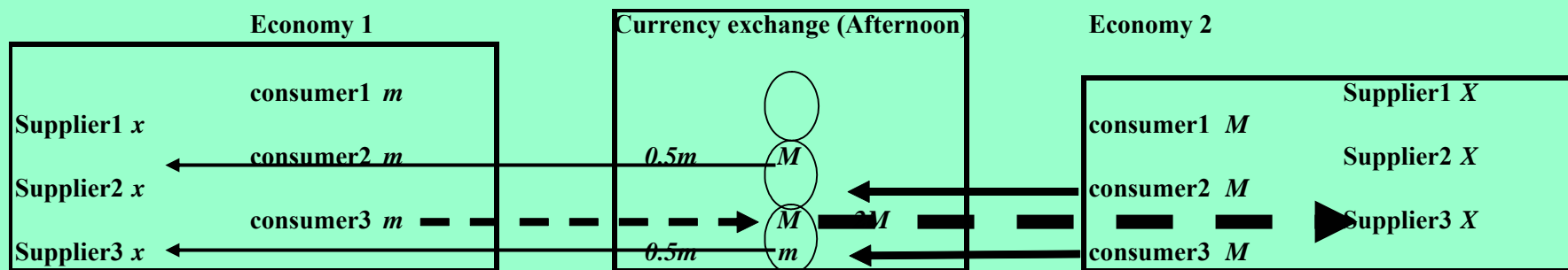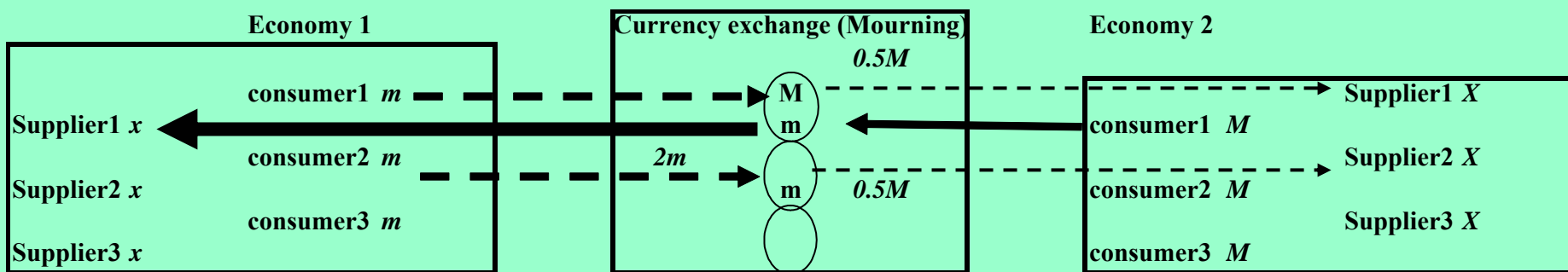
1. Contribution to literature: An Illustration

- Two identical economies, suppliers (endowed with goods) and consumers (endowed with domestic currency).

- Consumers want to get goods from foreign suppliers, but they need foreign currencies to do so.

- For simplicity, assume all consumers have the same amount of money in each economy.

Economy 1	Currency exchange	Economy 2

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Economy 1                    Currency exchange              Economy 2

              consumer1  m ─────────────────→ (M) ──────────────────→ Supplier1  X
Supplier1  x ←───────────────────────────────(m) ←─────────── consumer1  M
              consumer2  m ─────────────────→ (M) ──────────────────→ Supplier2  X
Supplier2  x ←───────────────────────────────(m) ←─────────── consumer2  M
              consumer3  m ─────────────────→ (M) ──────────────────→ Supplier3  X
Supplier3  x ←───────────────────────────────(m) ←─────────── consumer3  M
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An Illustration: Liquidity Problem

- Suppose that consumers' arrival rate at the foreign exchange market are not equal due to time zone gap.

Economy 1

Supplier1 x
Supplier2 x
Supplier3 x

consumer1 m
consumer2 m
consumer3 m

Currency exchange (Mourning)

0.5M

M
m

2m

m   0.5M

Economy 2

Supplier1 X

consumer1 M

Supplier2 X

consumer2 M

Supplier3 X

consumer3 M

Economy 1

Supplier1 x
Supplier2 x
Supplier3 x

consumer1 m
consumer2 m
consumer3 m

Currency exchange (Afternoon)

0.5m   M

M   2M
0.5m   m

Economy 2

consumer1 M

consumer2 M

consumer3 M

Supplier1 X

Supplier2 X

Supplier3 X

- Nominal exchange rate (m/M) fluctuates between 2 and 0.5 within a day. Want a constant exchange rate.

4

Frictions in foreign exchange market: Chapman vs. Fujiki (2003,2006)

- Chapman: Time zone gap results in trade between early creditors and late creditors.

Country A		Country B
α Early	**Early market**	α(1-β) Early
(1-α)βLate		αβ Early
(1-α)(1-β)Late	**Late market**	(1-α) Late

κ>1>τ

ψ common to countr A and B
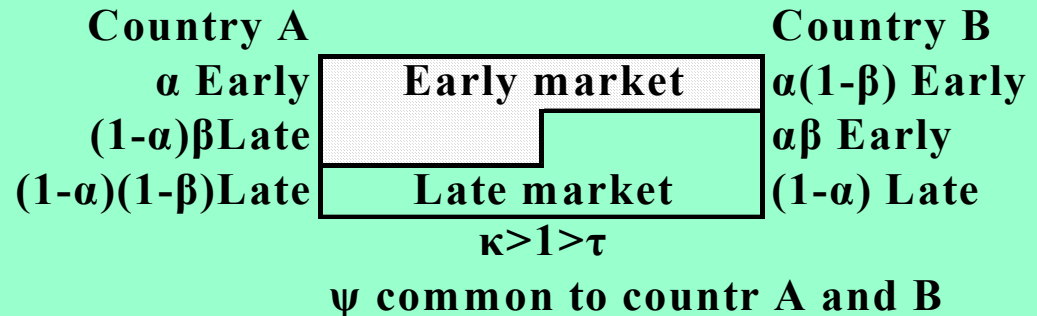
- Fujiki (2003,2006): Different size of banking sector and different timings of settlement. Early creditors trade with early creditors only. (β =0)

Country A		Country B
α(1-γ) Early	**Early market**	A(1-G)Early
(1-α)(1-γ) Late	**Late market**	(1-A)(1-G)Late

(1-γ) denotes proportion of agents with taste shock
(1-α) denotes banking sector size

Chapman's institution to improve welfare: No.1

- Single monetary authority that prints both A and B currency
- Given elastic supplies of credit in domestic credit markets, the interventions relax frictions due to time zone gap, and achieve social planner's allocation.
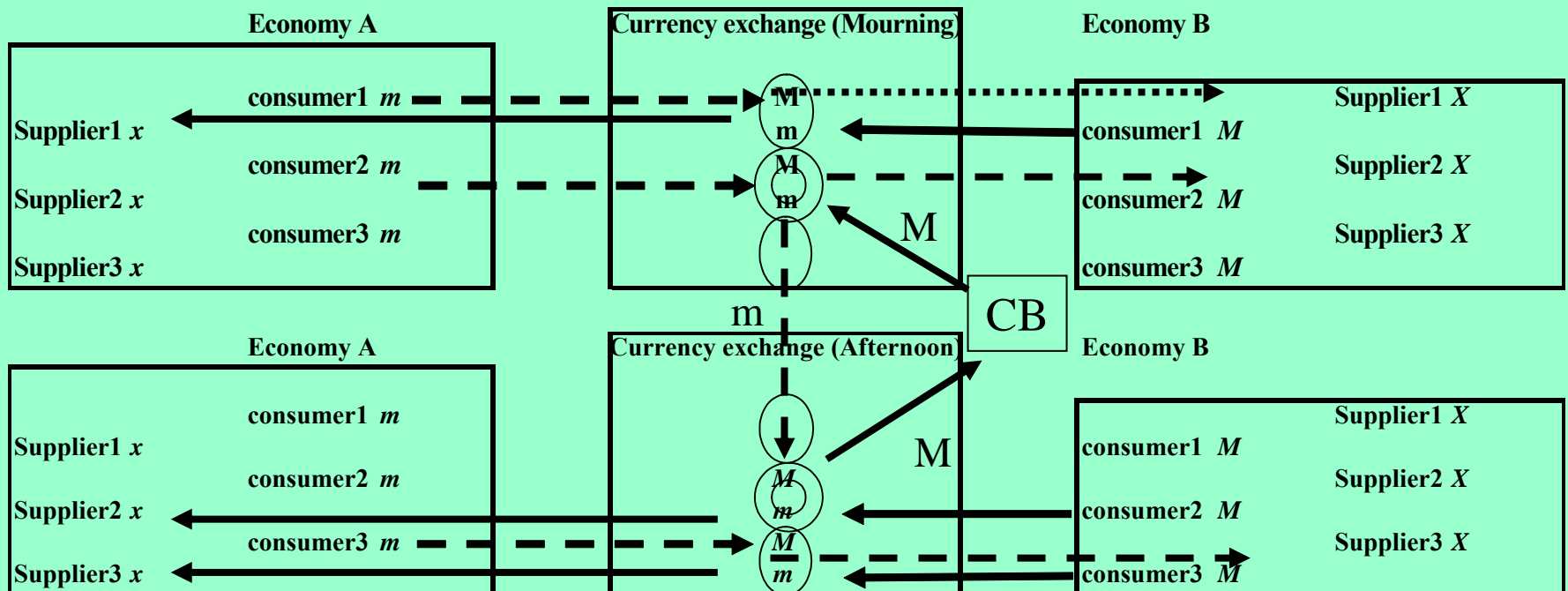
Chapman's institution to improve welfare: No.2

- Coordinated two monetary authorities
- Given elastic supplies of credit in domestic credit markets, the interventions of economy B monetary authority (sells B currency in early foreign exchange market and buys B currency in late foreign exchange market) relax the frictions due to the time zone gap and achieve social planner's allocation.

Chapman's institution to improve welfare: No.3

- Nash Policy Equilibrium: Each MA maximizes the utilities of their own debtors and creditors given the policy choice of the other MA.

- Two MAs cannot maintain the social planner's allocation, because the MAs do not take into account of the secondary effects of their domestic liquidity provisions on the foreign liquidity provisions through foreign exchange market.

- Indeterminacy of money supply level to support optimal exchange rate. If monetary authority of B injects more than optimum amount of currency, monetary authority of A sells A currency to keep exchange rate constant in early foreign exchange market, and buys A currency in late foreign exchange market.

2. Comments

- Institution 1 and institution 2: Similar to Fujiki (2003)'s two monetary authorities under gold standard.

- Institution 3: Brand new idea. A nice theoretical contribution.

2. Comments

- Are there any examples of one shot "Nash Policy Equilibrium" considered in this paper?

- In practice, MAs tried to cooperate their activities to deal with time zone gap frictions. For example, the CPSS (Committee on Payment and Settlement Systems) introduced the CLS bank motivated by the closure of Herstatt bank.

- MAs play repeated game cooperatively.

2. Comments

- Why does the MA in country B want to increase the money supply level more than optimal amount?

- In practice, MAs usually follow "overarching guidance," a clearly defined, readily verifiable objective for which the MAs can be held accountable (gold standard is an example).

- Some overarching guidance may help select a particular equilibrium.

2. Comments

- Is the main result valid under repeated games?

- Do we have any overarching guidance that stops the MA in country B increasing her money supply level more than the optimal level?

- Further study on those two questions may lead to a model for the CPSS initiative (unique cooperative solution under repeated game).

3. Other institutions may improve welfare (Fujiki (2006))

- CLS (Payment Versus Payment) + Intraday credit from a central bank.

- Currency Union (The conversion rate of currency of economy A and economy B at the equilibrium exchange rate under the social planner allocation)