9th session

10th April 2014

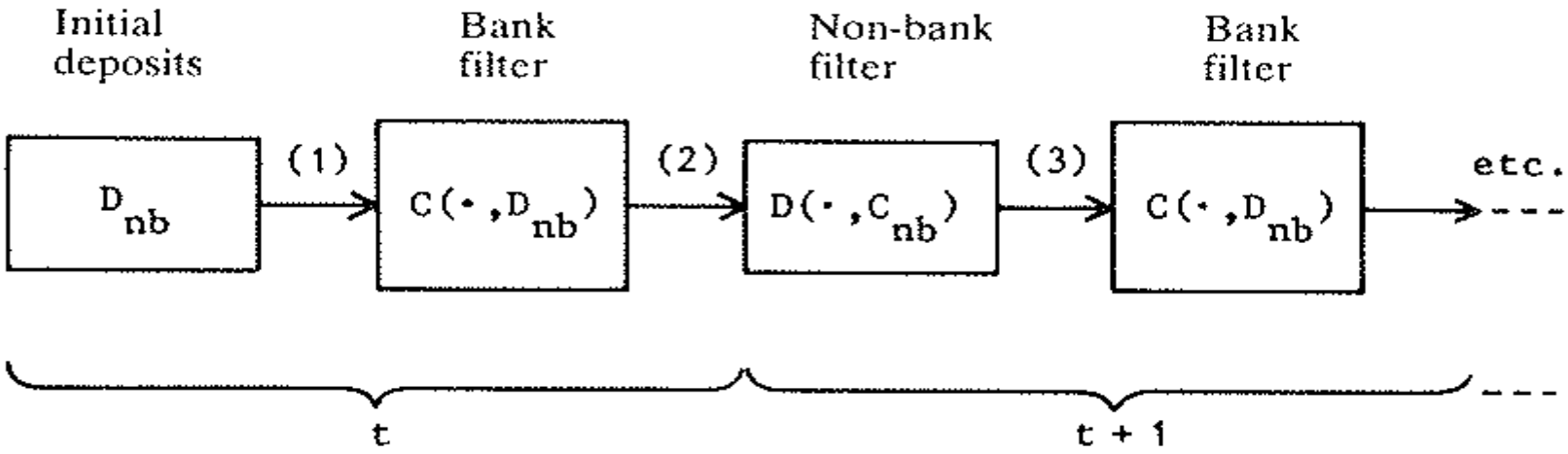
- How do the Euromarkets influence the capacity to use monetary policy?
- *offshore* markets – difficult to define and control the supply of a certain currency.
- Definition of Money Supply (M2) should include *offshore* deposits?
  - In principle, yes: *offshore* deposits made by residents and *onshore* deposits tend to be highly substitutable. BUT difficult to have high frequency data on that (BIS quarterly)

- Eurocurrency multipliers.
  - The potential of Euromarkets to expand the Money Supply out of the control of the domestic monetary authorities.

  - FIXED COEFFICIENT MODELS

Johnston, R. B. 1981, Theories of the growth of the euro-currency market: a review of the euro-currency deposit multiplier, http://www.bis.org/publ/econ4.pdf?noframes=1

  - Swoboda (1968), Friedman (1969)



- Simplest Model: $C(., D_{nb}) = 1\text{-}r$ and $D(., C_{nb}) = 1$

r: fraction of deposits held as reserves by the Banking System

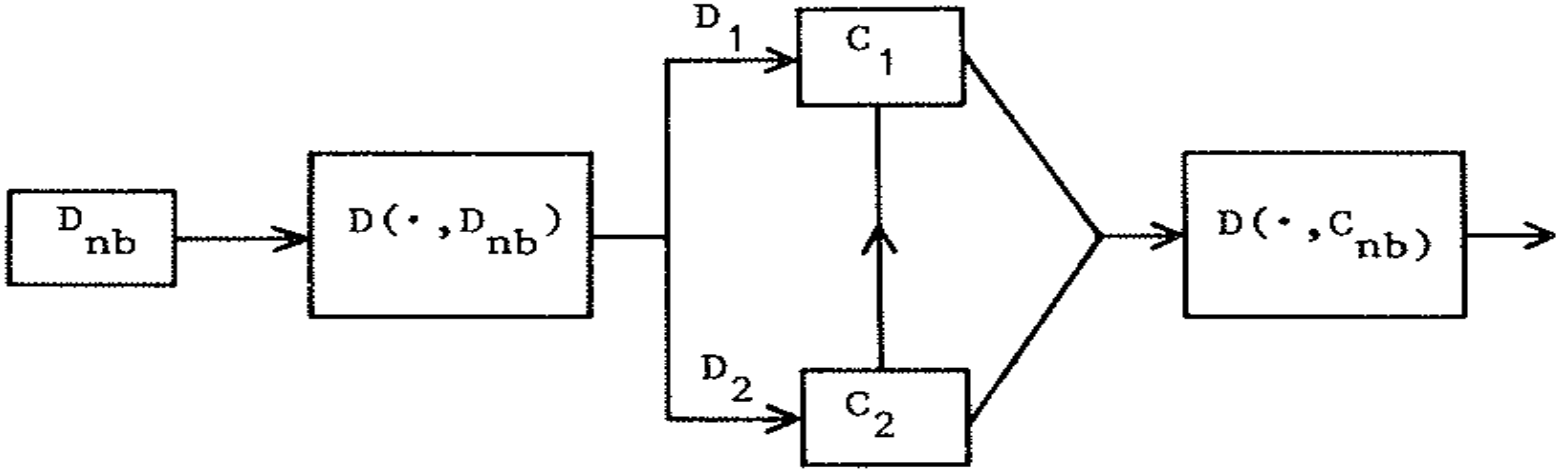
All credit returns to the Banking System as new deposits.

$D_{nb}^{F} = D_{nb} + (1\text{-}r).D_{nb} + (1\text{-}r)^2 D_{nb} + \ldots$

- geometric progression : $\sum_{\kappa=0}^{\infty} a.q^{\kappa} = \frac{a}{1-q}$

- $D_{nb}^{F} = D_{nb} / r$

- With the euromarket:



$D_1 = b$ part that is deposited with the domestic banking system.
$D_2 = 1 - b$ part that is deposited with the euromarket.
$C_1 = 1\text{-}r_1$ for deposits placed with the domestic system.
$C_2 = 1\text{-}r_2$ for the deposits placed with the euromarket.

$$D_{nb}^{F} = D_{nb} + \{[(1-b).\, D_{nb}(1-r_2)]. + [(1-b).D_{nb.} r_2\,(1-r_1) + b.\, D_{nb}(1-r_1)]\} + \ldots$$

euromarket Domestic System

$D_{nb}^{F} = D_{nb} + D_{nb}\{[(1-b).(1-r_2)]. + [(1-b).r_2(1-r_1) + b.(1-r_1)]\} + \ldots$

The ratio of the progression is $\{.\}$

Simplifying: $\{.\} = 1 - r_1.b - r_1.r_2.(1-b)$

$D_{nb}^{F} = D_{nb} / [r_1.b + r_1.r_2.(1-b)] = D_{nb} / [r_1(1-(1-r_2)(1-b))]$

- The larger the proportion of total deposits that is held in the Eurocurrency market (1-b)
- The smaller the Eurocurrency reserve ratio (r_2)

⇨ The Larger the money multiplier

- The euromarket can be said to have an expansionary effect on the global money supply.

Note: It does not rely on $r_2 < r_1$.

- The fact that the rate of creation of liquidity in the banking system be greater with the Euromarket raises difficulties to monetary authorities.
- To calculate the multipliers it is necessary to assume that the reserve and redepositing ratios are reasonably stable or predictable.
- Difficult to measure D_{nb}^{F}, total deposits.
- The Eurodollar expansion stops if the deposits in foreign banks are transferred back to the original country.

- PORTFOLIO MODELS
- There is a natural limit to the liquidity expansion by the banking system: the deposits are a fraction of private wealth.
- For non-banks to be willing to hold more deposits at a given level of wealth or income, deposits have to be made more attractive in relation to other assets.
- The funds move to where the return is higher.
- Models of fixed coefficients: do not take into account the changes in interest rates that result from the changes in the banks balance sheets.
- Adjustments in the interest rates limit the dimension of the euromarket multiplier. The flow of funds to this market → reduces the interest rate in the euromarket and raises it somewhere else.

- General equilibrium models of the world's financial system try to integrate these interactions between the euromarkets and the domestic banking systems: Freedman (1977) e Hewson e Sakakiraba (1976). In the economic system, the sum of world assets and liabilities is given and only the allocation is decided.

- Conclusion: The eurocurrency market has an endogenous potential to create money, but it is limited by portfolio considerations.

Offshores

Rose & Spiegel (2007)

- OFC: Offshore Financial Centre - definition?
  - Any financial centre where offshore activity takes place? Broad: it would include any major financial centre in the world.
  - Financial centre with external assets and liabilities out of proportion to domestic financial intermediation:
    - Large number of financial institutions engaged in transactions with non-residents.
    - Centres that provide some or all of the following services: low or zero taxation, light financial regulation, banking secrecy and anonimity. IMF (2000)
      http://www.imf.org/external/np/mae/oshore/2000/eng/back.htm#II_A

- Variety: Hong Kong or Singapore *vs* Caribbean Islands (market development, infrastructures, supervision)
- REASONS TO DEVELOP AN OFC
  - Generation of employment in the host economy.
  - Generation of government revenue (through licensing fees, for example).
- REASONS TO USE AN OFC
  - Legitimate: lower explicit taxation, simpler prudential regulations (better prices), the reputation of specific OFC's and the quality of services. Some OFCs specialize in particular services. For example, Singapore- hedge funds.
  - ILLegitimate: tax evasion (different from tax avoidance), money-laundering.

Supranational iniciatives

- With the aim of
  - Countering money laundering
  - Enhancing onshore tax enforcement
  - Limiting global financial risks

supranational agencies are taking action:

- *Organisation for Economic Co-operation and Development* (OECD)
- *Financial Stability Forum* (Basle).
- *IMF* OFCs program

- In 2000, the OECD - Committee on Fiscal Affairs (CFA) published a list of non-cooperative jurisdictions, countries with practices facilitating tax evasion.
  - "jurisdiction" - any territory with its own legal system, regardless of whether it is an independent or sovereign state.
- Identifies Tax Havens
  - (1) no or only nominal effective tax rates;
  - (2) lack of effective exchange of information on taxpayers with governments;
  - (3) lack of transparency
- In 2000: 41 tax havens, of which 6 had made commitments to cooperate.
- In 2007: 3 jurisdictions were no longer considered tax havens. 33 had made commitments to improving transparency and establishing exchange of information. 5 were 'uncooperative': Andorra, Liechtenstein, Monaco, Liberia and the Marshall Islands.

- Onshore countries can restrict the access to banking and securities markets for institutions in jurisdictions that are considered inconvenient (uncooperative).
  - OFC's rely on access to foreign markets. It is in their interest to accommadate the demands of the onshore countries and of the supranational agencies.
  - But the countries imposing the sanctions will lose business. Only if all countries coordinate in imposing the sanctionsis this sustainable.

- Financial Stability Forum
  - Created in 1999.
  - Considers the role of OFC banks as a threat to the stability of the financial system
  - Evaluates their adherence to accepted standards and good practices
  - Makes recommendations.

- IMF OFCs program

(i) regular monitoring of OFCs' activities and compliance with supervisory standards;

(ii) improved transparency of OFC supervisory systems and activities;

(iii) technical assistance (TA) to improve statistics in the areas of monetary and financial statistics and balance of payment data

(iv) collaboration with standard-setters and onshore and offshore supervisors to strengthen standards and the exchange of information.

- End of 1990's – Industrialized countries:
  - **Attraction** associated with reserve requirements, interest rate controls, capital controls, **diminished.**
  - **Attraction** associated with tax advantages (ex.: inheritances, asset management) **remained**.
- Still particularly attractive to banks in emerging market economies, frequently with highly regulated financial markets.

IMF (2000)

- After September 11th 2001, OFCs were seen as dangerous (supposedly helping to finance terrorism). After the 2007-08 financial crisis, dangerous again.

«Harmonisation of financial rules looks as far away as ever. And where there are differences in national tax rates, regulatory standards and confidentiality laws, there will be opportunities for “international financial centres” to offer “legitimate arbitrage”»

The Economist, Feb 16th 2013

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The Microstructure of Financial Markets

↳ Harris;

- Definition
  - Mark Garman (1976)

Traditional approach *vs* Market Microstructure

- Traditional approach:
  - The equilibrium exchange rate is mainly a macroeconomic phenomenon, determined by fundamentals.
  - Beliefs and expectations are homogeneous.

- Market Microstructure fits in Financial Economics and studies "the **black box**":
  - Price formation and price discovery;
  - Market structure and the way specific trading mechanisms affect the results, including the price
  - Frictions, imperfect information, assimetries.

- Transactions-
  - Price formation in financial markets more complex than the Walrasian auctioneer equating Supply and Demand.
    - Traders do not arrive simultaneously
    - Asymmetric information.
- Intermediaries- Help parts meeting.
  - Dealers
  - Brokers

- Orders- trade instructions. They always specify:
  - what traders want to trade,
  - how much they want to trade,
  - whether to buy or to sell.

  They can specify other aspects. Examples:
  - for how long the order is valid,
  - when the order should be executed,
  - whether it can be partially executed.

- The best *bid*: the highest bid price in the market.
- The best *ask (offer)*: the lowest offer price in the market.
- The difference between the best ask and the best bid is the market *bid/ask spread* .

- **MARKET ORDER**

  Oferta "ao mercado"

  – Instruction to trade at the best price available in the market.

  – The trader is sure to trade. He is not sure of the price.

  – Small market orders are generally executed immediately without much effect on prices.

- Suppose the best bid of an asset is 100 and the best ask is 102.

Without further information, our best estimate of the value of the asset is the average: 101.

The buyer pays 102: pays 1 more unit than the estimated value (half the *spread*). Price of liquidity. The seller receives 100: receives 1 unit less than the estimated value of the asset (half the *spread*). Price of liquidity .

- Large market orders are harder to execute. It may be hard to find traders willing to take the other side, either because they are not interested in the asset or because they are afraid to be trading with someone with superior information. To attract a counterpart, the sellers may have to sell cheaper and the buyers may have to accept to pay more. PRICE IMPACT.

- In illiquid markets, with few participants, the price impact is larger than in liquid markets.

- **LIMIT ORDER**

  Oferta "limitada"

  – Instruction to trade at the best price, as long as it is not worse than the specified limit price.

  - A limit buy order specifies the maximum price that he/she is willing to pay.
  - A limit sell order specifies the minimum price that he/she is willing to accept.
  - Standing limit orders are placed in a file called the limit order book *(livro de ofertas central)*.
  - A limit order may not be executed.

- *Marketable* limit order: it may be immediately executed. It is equivalent to a market order.
- Buy orders that are not immediately executed may be *in the market* or *behind the market*.
  - A limit buy order with a limit price less than the best bid is *behind the market*.
  - A limit sell order with a limit price above the best offer is *behind the market*.
  - A limit order is *in the market* if limit price is between the best offer and the best bid.
  - Traders who submit standing limit orders, offer liquidity – they give the other traders the option to trade when they want.
  - Traders who submit market orders take liquidity - they want to trade quickly and accept the conditions that other traders have made.

- Buy limit orders are *put options*. They give other traders the opportunity to sell when they want to sell.
- Sell limit orders are *call options*. They give other traders the opportunity to buy when they want to buy.
- Standing limit orders are different from option contracts because no one sells the option, it is freely granted to the market. Any one may use the limit order option by submitting a market order.
- The option value of a limit order is the value of the order to other *traders*.
  - Limit price- If it is far behind the market it has little value. Traders prefer to trade first, with better prices. If it is marketable, traders who want to trade immediately value the option to trade.
  - How long the order stands - Orders that remain available for a long time allow traders to defer the trader decision, possibly to see the price changes. The probability that prices change is larger in longer intervals. Therefore, the option is more valuable.

- Volatility- When prices change fast, it increases the probability of executing a profitable trade. There are higher chances of profiting from taking the limit order before traders cancel it.

- Using limit orders with a *broker* allows attending to other businesses without a permanent surveillance of the market.

- **STOP ORDER** – It is used to stop losses when prices move against the position. Traders buy after price rises to the stop price and sell when price falls to the stop price.
  - A stop order may be executed at a price different from the stop price, if prices move quickly.

- Stop orders add *momentum* to the market. They are sell orders when prices are falling and buy orders when prices are rising. Accelerate price changes →destabilizing effect

- **MARKET-IF-TOUCHED ORDER (very rare)** – Order to buy when prices fall to the *touch price* or to sell when prices rise to the *touch price* . →stabilizing effect
- Contrary to a limit order, it fills at the best available price.

- Specially with limit orders and with stop orders it is important to specify their validity.
- Quantity instructions. For example all-or-none and minimum acceptable quantity.

- Market structures
  - Rules that regulate trading: who can trade, what can be traded, the location and the timing of the trades, the information that is revealed.
  - Continuous Markets *vs* call markets
    - advantage of continuous markets: flexibility – traders may try to trade at any time.
    - advantage of call markets: increases liquidity at the same time and place.

- Execution systems.
  - Quote-driven (dealers) *vs* order-driven (order precedence rules).
    - Order-driven markets

    Buy and sell orders are matched without intermediaries, (except maybe brokers) based on order precedence rules.
      - (Usually) Auction markets: Call markets *vs* Continuous auctions

      Basic types of orders: limit orders and market orders.
      - One type of order-driven markets are Crossing Networks: call systems that cross orders at predetermined times; orders submitted without price.Price derived from the asset's primary markets.
  - Foreign exchange market: *quote-driven*.
  - Sometimes dealers trade in *order-driven* markets. In this case they trade with who accepts the order.

- Hybrid markets

- Revealed Information – Transparency
  - Capability of market participants to obtain information about the trading process.
    - The forecast of the evolution of prices depends on the revealed information.
    - The information may be about the time of execution of the order and may allow the assessment of the performance of a broker.
    - Sold information may be a significant part of the revenue.

- Markets with electronic trading systems facilitate the registration of information.
- A market is said to be transparent when the public has complete information.
- Markets that show only the best bid and the best ask show "the top of the book".
- Markets that show the standing orders at each price are "open book" markets.
- Transparency is of particular interest to those that do not possess private information.

- Information: Pre-trade or Post-trade (Fig 1.3 De Jong & Rindi)

POST-TRADE INFORMATION -

- Orders' direction
- Orders' dimension
- Traders' identity

PRE-TRADE INFORMATION <

- Prices
- Quantities
- Identification codes (anonymity)

- To the whole market
- To some market participants

- Comparison of Quote-driven and Order-driven markets with respect to Transparency
  - Quote-driven markets tend to be more fragmented, different dealers may quote different prices and these are not necessarily made public.
  - Order-driven markets with a limit order book tend to be less fragmented. However, the limit order book is not necessarily open.