Market dislocations


Disclaimer: Views expressed are those of the author and do not necessarily represent those of the Deutsche Bundesbank.
What are financial market dislocations?

- What do you associate with financial market dislocations?
What are financial market dislocations?

„Financial market dislocations are elusive to define, and difficult to measure.“

Motivation

- Financial market dislocations can have a negative influence on the financial system and the overall global economic development.
- They pose a threat to financial stability and price stability.
- Market dislocations are however, elusive to define and difficult to measure.
- This presentation gives one possible definition for financial market dislocations, linked with case studies for certain market segments (stock market, interbank and foreign exchange market and sovereign bond market).
- It will also try to identify measures to limit the negative influence of financial market dislocations on the financial market and the global economy.
- Further it gives an example for a financial market failure which is not based on the definition of market dislocations which is used here.
I. Defining financial market dislocations
II. Asset price bubbles in the stock market
III. Persistent deviation from interest rate parity
IV. The European sovereign debt market
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I. Defining financial market dislocations
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Defining financial market dislocations

One possible definition:

„Financial market dislocations are circumstances in which financial markets, operating under stressful conditions, cease to price assets correctly in an absolute and relative basis.“

The assessment of absolute mispricing is subject to considerable debate and significant conceptual and empirical challenges.

According to this definition we will consider three examples:

1. Asset price bubbles in the stock market
2. Persistent deviations from covered interest rate parity
3. The European sovereign bond market
In functioning financial markets capital demand and supply is balanced.

In the theory of efficient markets:
- Prices of all financial instruments reflect all available information.
- As a result markets adjust immediately and continuously to changes in fundamental values.
- (No one can consistently beat the market average).

Financial markets are not necessarily efficient.

In a non-efficient financial market prices are typically determined by two components:

1) A fundamental component reflecting real-world economic conditions
2) A speculative component essentially consisting of market expectations on the future evolution of the price itself
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Asset price bubbles in the stock market

**Definition of stock market bubbles (empirical)**

  - Bubble = boom followed by a crash.
  - A boom is a large, rapid increase in stock prices.
    1. Market value (or cumulative return) increased by at least 100% in one year.
    2. A period of three years over which the market increased by 100%.
  - A crash is defined as:
    1. A drop of at least 50% in the following year, i.e. following a boom year.
    2. A drop of at least 50% over the next five years.
Asset price bubbles in the stock market

The dot.com bubble

Development of the Nasdaq:

- Peak in March 2000 at 5046.86 points.
- More than twice of the value at which it stood the year before.
- October 9th 2002 down to 1114.11 points
- No fundamental value available.


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Asset price bubbles in the stock market

- Why do asset price bubbles pose a risk?
- What can be done about it?
Asset price bubbles in the stock market

Asset prices, economic trend and disturbance of the financial system

- **Asset prices and economic trend**
  1) Higher asset prices lead to higher consumption and investment (higher real GDP growth)
  2) The expected economic trend influences the expectation of profits of enterprises and therefore the value of the stock price.

- **Asset prices and banking crisis**
  3) Large asset price drops lower the value of banks’ collateral, this might lead to higher losses in the banking sector.
  4) Banking crisis lead to lower lending activity and indirectly to lower prices (e.g. house prices as the demand is lower; investment in start-ups)

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Source: Kimmel (2006) pg. 322
Asset price bubbles in the stock market

Asset prices, economic trend and disturbance of the financial system

- Banking crisis and economic trend

5) Banking crisis can amplify economic downturns and lead to long recession periods.

6) Economic downturns in conjunction with a decrease in asset prices could lead to banking crisis.

Source: Kimmel (2006) pg. 322
Asset price bubbles in the stock market

**What can be done?**

- **Macropudential policy**
  - Warnings in financial stability reports
  - Increase resilience of financial intermediaries (equity, liquidity)
  - Close markets

- **Microprudential supervision**

- **Financial education**

- ...
Agenda

I. Defining financial market dislocations
II. Asset price bubbles in the stock market
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Persistent deviation from covered interest rate parity

Introduction

Definition for market dislocations:

„Financial market dislocations are circumstances in which financial markets, operating under stressful conditions, cease to price assets correctly in an absolute and relative basis.“

The assessment of absolute mispricing is subject to considerable debate and significant conceptual and empirical challenges.

However: the assessment of relative mispricing stemming from arbitrage parity violations is less controversial.

In the following: Persistent deviation from covered interest rate parity
Persistent deviation from covered interest rate parity

The concept of arbitrage

- Assumption: prices of securities in financial markets fully reflect all available information.
- The rationale behind this hypothesis: The concept of arbitrage.
  - Arbitrage is the practice of simultaneously buying and selling financial instruments to benefit from temporary price differences; eliminates a riskless profit opportunity.
  - Arbitrage leads to the state in which two financial instruments with the same risk and promised future payment will sell for the same price.
  - The people who simultaneously buy and sell financial instruments in order to benefit from temporary price differences, leading thereby to arbitrage, are called arbitrageurs.

Who could be arbitrageurs?
Persistent deviation from covered interest rate parity

**Arbitrageurs and different kinds of arbitrage**

- **Arbitrageur**: in most cases a large financial intermediary with good credit rating (e.g. Hedge funds, investment banks,…).

- Two types of arbitrage: **Secured** and **unsecured** arbitrage
  
  - **Secured** arbitrage: borrowing and lending funds on secured terms (arbitrageur e.g. hedge funds)
  
  - **Unsecured** arbitrage: borrowing and funding on unsecured terms (arbitrageur e.g. bank’s proprietary trading desk)
The concept of CIP arbitrage

The trade is borrowing in one currency (k) and lending in another (j) to take advantage of interest rate differentials while avoiding exchange rate risk.

Profits from CIP arbitrage can be expressed as:

$$z_{1,t} = \frac{F_{t\ldots T}}{S_t}(1+r_{j,t})-(1+r_{k,t})$$

$S_t$ is the spot exchange rate at the price in currency k of one unit of currency j, $F_{t\ldots T}$ is the forward exchange rate.

According to economic textbook: CIP arbitrage is normally risk less and should yield zero profits.
Persistent deviation from covered interest rate parity

**Secured arbitrage**

Lender L

1. collateral

Trader

2. spot

3. cash

4. forward

Borrower B

Source: Mancini et al (2011), pg.i
**Persistent deviation from covered interest rate parity**

**Secured arbitrage**

1. CIP secured arbitrage involves four actions: two on the money market (repo and reverse repo) and two on the forex market (one spot and one forward).

   1) Borrowing in any currency $k$ for $T-t$ days (at interest cost $r_{k,t,T}$);

   2) Exchange the borrowed amount to currency $j$ at the spot exchange rate.

   3) Lending in Currency $j$ (at interest rate $r_{j,t,T}$)

   4) Hedging the foreign exchange risk of repaying the original loan.

   The trader for secured arbitrage could be a hedge fund, e.g..
Persistent deviation from covered interest rate parity

Unsecured arbitrage

Lender L

Trader

Borrower B

FX counterparty

Source: Mancini et al (2011), pg.i
Persistent deviation from covered interest rate parity

**Unsecured arbitrage**

- Unsecured arbitrage involves the money market and the FX market.
- Lending and borrowing takes place at the money market at overnight bid and offer rates, with accompanying index swaps to hedge interest rate risk.
- The trader could be a proprietary trading desk of an investment bank, e.g.
Persistent deviation from covered interest rate parity

For most of the post-Bretton Woods period until 2007, CIP was one of the most reliable and relied upon parity conditions in international finance. (Levich, 2017, pg. 1)

How did we rely on CIP?
Deviation from covered interest rate parity

Reliance on CIP arbitrage

I How did we rely on CIP?

- For knowing the term structure of equilibrium forward rates
- To understand the relationship between spot and forward speculative currency returns
- To understand the relationship between covered costs (and returns) in two or more currencies.
- In open macro models that assume perfect capital mobility and the equality of interest differentials and forward premia.

I Deviations from CIP provided their own barometer of conditions in the foreign exchange market and how close we were to perfect capital mobility.
Deviation from covered interest rate parity

Figures

- Summer 2007: Two hedge funds operated by Bear Stearns suspended redemption; BNP Paribas announced that they were unable to value three hedge funds.

- May 2008: Bear Stearns collapsed

- September 2008: Lehman Brothers failed.


Note: Daily data on EUR/USD spot rates, 3-month forward rates, and 3-month USD LIBOR and EUR EURIBOR are from Bloomberg. Deviations from covered interest parity in basis points per annum calculated as \[[F/S] \times (1+[(EUR/400) - (1+[(USD/400)]] \times 40,000\].

Source: Levich (2017) pg. 29
Deviation from covered interest rate parity

What are possible factors that led to the sharp increase in CIP deviation?
Persistent deviation from covered interest rate parity

Possible factors leading to mispricing

1. Interbank market was in dislocation in 2008.

2. Further there was a lack of dollar funding liquidity due to:
   - Deleveraging imperatives
   - Prudential requirements
   - Limited capital to pledge in exchange for liquidity

3. Heightened sense of counterparty risks, even among large banks active in the FX-market

4. Limited balance sheet capacity (Hedge funds)
What could be the consequences?

- Less reliance on CIP
- Enhance the resilience of arbitrageurs by higher liquidity requirements
- Enhance transparency
- ...
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The European sovereign debt market

Definition for financial market dislocations:

„Financial market dislocations are circumstances in which financial markets, operating under stressful conditions, cease to price assets correctly in an absolute and relative basis.“

The European sovereign debt market

Euro area sovereign spreads

- Convergence
- Euro-"Honeymoon"
- Divergence & ECB support

Spreads vs. 10-year Bunds in bps.
Source: Reuters, own calculations.
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Financial market failure not based on a dislocation

So far the definition of market dislocation was:

„Financial market dislocations are circumstances in which financial markets, operating under stressful conditions, cease to price assets correctly in an absolute and relative basis.“

Now:

What happens if there are high impediments that prevent a market to come about?

– Case study: The secondary markets for NPLs in Europe
Financial market failure not based on a dislocation

**NPLs in the eurozone**

- Stock of NPLs in the EU banking sector was around €1.0 trillion at the end of 2016.
  - Countries hit particularly hard by the financial crisis
  - Ratios going down or stabilizing past 2 years (increase in Greece in 2017 due to change in measurement)

- Reasons for increase were diverse
  - Real estate bust
  - Recession
  - Others

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Non-performing loans to total gross loans*

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*Quarterly data for Ireland, Italy, Portugal, Slovenia and Spain are not continuously available.

Source: IMF. Deutsche Bundesbank

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Market dislocations
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Financial market failure not based on a dislocation

No secondary market for NPLs

- Secondary markets for NPLs in Europe were prone to significant information asymmetries and uncertainties about true NPL values. (Market for lemons)

- Wide gap between prices investors were willing to pay and the net book values on banks' balance sheets.

- Several types of impediments explain wide bid-ask spreads in NPL markets.
Financial market failure not based on a dislocation

Identified impediments for secondary markets of NPLs

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<th>Supply-side</th>
<th>Structural</th>
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<tr>
<td>• Poor quality of NPL data</td>
<td>• Accounting standards (IFRS 39) do not recognize all costs in book valuation of NPLs</td>
<td>• Weak, lengthy and inefficient debt enforcement and judicial proceedings</td>
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<td>• Lack of independent servicing capacity</td>
<td>• First-mover disadvantage in shallow NPL markets</td>
<td>• Legal requirements for loan sales (e.g. need for consent of debtor)</td>
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<tr>
<td>• Taxation (e.g. transaction taxes, VAT on servicing)</td>
<td>• Lack of asset management and turn-around expertise</td>
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Financial market failure not based on a dislocation

What could be done to remove existing market impediments in the secondary markets for NPLs in Europe?

At the bank level, address challenges related to the availability, comparability and quality of data as well as the lack of standardization of loan tapes, in order to improve the marketability of NPLs.

Increase bank’s incentives to sell and widen the investor base to acquire and manage NPLs in secondary markets, including through the securitization of NPLs.

Lift impediments to third-party servicing and remove remaining barriers to the transfer of NPLs to third-parties while ensuring the right level of consumer protection.

Strengthen data and market infrastructures to address market failures in secondary markets, where appropriate.
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Financial market dislocations are circumstances in which financial markets, operating under stressful conditions, cease to price assets correctly in an absolute and relative basis." (Pasquariello (2014): Financial Market Dislocations)

Dislocations can occur in all market segments.

Market dislocations have an influence on economic development and they can endanger financial stability leading to financial crisis.

There are several measures (e.g. increase the resilience of market players, transparency, etc.) to limit the extent of market dislocations.

Not every market failure is a market dislocation, as well. The reasons why financial markets are not working are diverse and must be investigated case by case. Then the right measures can be taken to make the market work smoothly.
References

I Basic reading:

- Cecchetti and Schoenholtz (2017): Money, banking and financial markets, chapt. 9, pg. 204-205.

I Further reading:

- Mancini et.al (2001): Limits to arbitrage during the crisis: funding liquidity constrains and covered interest rate parity