Finance in the 21st Century: 4 Bytes of Financial Data

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Topic of our research: Liquidity

• Liquidity: quickly trade large volume with low costs.
• High liquidity increases economic growth
  – investors are willing to commit to long-term projects and companies pursue them.
• Joint work with: Mathijs van Dijk, Dion Bongaerts, Darya Yuferova
• Liquidity shocks in one market (e.g. house loans) can have effects in
  – seemingly unrelated asset classes (stocks)
  – seemingly unrelated countries (worldwide)
Goal of our research: SPC Crash (6-May-10) - 6% (above) in 15 minutes
DAX Crash (25-Aug-11) - 4% (below) in 15 minutes
**4 Bytes of Financial Data: 5196.56**

<table>
<thead>
<tr>
<th>Major stock market indexes</th>
<th>Global Markets Lineup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock indexes from around the world, grouped by region. Shown in local-currency terms.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Index</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>CAC-40</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>DAX</td>
<td>5196.56</td>
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<tr>
<td></td>
<td></td>
<td>14040.77</td>
</tr>
</tbody>
</table>
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## 4 Bytes of Financial Data

<table>
<thead>
<tr>
<th>Instrument / Number of Daily Observations</th>
<th>Trades</th>
<th>Best Buy and Sell prices for one share</th>
<th>Best Buy and Sell prices for X shares</th>
<th>Market-Makers buy/sell prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 DAX Stocks (2010)</td>
<td>90,000</td>
<td>390,000</td>
<td>2,400,000</td>
<td></td>
</tr>
<tr>
<td>3 DAX Futures (2010)</td>
<td>120,000</td>
<td>180,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 Dax Options (2011, 2005)</td>
<td>370,000</td>
<td></td>
<td></td>
<td>5 million</td>
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<tr>
<td>Eurex (2011)</td>
<td>9.1 million</td>
<td></td>
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</table>
DAIGN.DE On 26-Jan-2010, 13 to 14 o'clock
The need for the Cloud

- More than 400 exchanges worldwide
- More than 45 million different instruments
- More than 350 data fields
- 15 years of data (since 1996)

- Data Storage: Around 200,000 Giga Bytes of data

- CPU Power: Often need to merge data:
  - Trades To Quotes
  - Trades On X To Trades On Y
Thank You For Your Attention
Need to merge data: OneTick
Financial development and economic growth: The role of liquidity

• Rajan and Zingales (1998)
  – Financial development should measure ease of bringing borrowers and savers together and confidence both parties have in each other.
  – Information, enforcement and transaction costs

• Wurgler (2000)
  – Developed financial markets allow better allocation of capital due to less co-movement due to common risk factors

• High Liquidity And Low Liquidity Risk
  – decrease information costs: increases speed of incorporating information into prices (smaller no-trade zones)
  – increase supply: investors are willing to commit to long-term projects if exit is cheap
  – increase demand: decrease of illiquidity premium on stocks decrease capital cost for companies
  – increases confidence: Decrease probability and costs of defaults?