AnaCredit: From broad to flexible macroprudential analysis

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## Contents

1. Granular data for macroprudential supervision
2. AnaCredit data model: representing reality
3. AnaCredit content: scope, detail, networks, distribution
4. Case study: real estate data gaps
5. Exploring indicators from the top down
6. Future extensions
Granular data for macroprudential supervision

Past

Broad approach

• Aggregate indicators

• Constrained by static definitions and complex relationships between agents

Future

Top-down and bottom-up approaches with three advantages:

1. Detail: flexible definition of indicators (with back-casting) and calibration and estimation of models

2. Networks: concentration of risk and contagion effects

3. Distributions: rich analysis of the complete population with simulations

AnaCredit: from bottom-up to top-down macroprudential analysis
Financial intermediation is complex

- **Instruments**: Multipurpose contracts
- **Counterparties**: Creditor, debtor, protection provider, etc.
- **Protection**: Collaterals and guarantees
- **Relationships**: Banking groups / corporate groups
  - Syndicated loans / joint debtors
  - Umbrella contracts
  - n-to-m instrument-collateral relationships
AnaCredit Regulation (EU) 2016/867 adopted 18 May 2016

AnaCredit go-live: September 2018

- Reporting population: credit institutions
  - Resident in the euro area
  - Includes all foreign branches

- Counterparties:
  - Creditors: credit institutions & other sectors (for loans serviced by CI)
  - Debtors: legal entities (including Government)

- Instruments (assets): loans (including inter MFI positions)
  - Serviced or held

- Threshold (creditor-debtor): EUR 25,000
88 attributes to assess credit intermediation

- Counterparties: \( \text{Who is who?} \)
  - Identification of creditors and debtors
  - Characterisation: e.g. size, sector of economic activity

- Balance sheet status \( \text{What?} \)
  - Classify exposures by type (e.g. type of product) and use (e.g. securitisation)
  - Needed for internal consistency: avoid double counting (e.g. joint liabilities)

- Exposure features \( \text{What (in greater detail)?} \)
  - Classify the exposures for analytical purposes (e.g. maturity, interest rate)

- Risk measure \( \text{Will it happen?} \)
  - Provide a forward-looking view (e.g. probability of default)

- Loss measure \( \text{What would happen?} \)
  - Provide a backward-looking view (e.g. accumulated impairments)

- Valuation \( \text{How much?} \)
  - Book values, nominal values, market values
Four indicative use cases

Examples for AnaCredit attributes that may be relevant

**Concentration of risk**
- Head office/immediate/ultimate parent identifiers
- Address: country
- Economic activity
- Outstanding nominal amount

**Contagion**
- Outstanding nominal amount
- Type of securitisation
- Type of protection
- Protection value

**Level of exposure**
- Enterprise size
- Outstanding nominal amount
- Off-balance sheet amount
- Probability of default

**Losses**
- Legal final maturity date
- Settlement date
- Arrears for the instrument
- Accumulated impairment amount
AnaCredit networks – counterparty relationships

- **Banking groups**
  - Pseudo-consolidation
  - Different levels of banking groups (e.g. national level, EU level)
  - Syndicated loans

- **Corporate groups**

- **Location**

- **Sectors of activity**
  - Institutional sector
  - NACE level 3

- **Contagion**
  - Inter MFI positions
  - Unique identification of counterparties
  - Banks with similar business models

- **Extensibility via RIAD***

* RIAD: Register of Institutions and Affiliates Database
AnaCredit distributions

- Individual information
- Near complete population

Building the full distribution for all entities

Describing the complete population
- Average (traditional)
- Additional descriptive statistics for the population
  - Central tendency
  - Dispersion
  - Concentrations

e.g. focus on the tail
(entities that accumulate risk)

Combining indicators
- Loan-to-value - NPL ratio - bank size
- Correlations
Case study: ESRB Real Estate Indicators

- Based on ESRB Recommendation (ESRB/2016/14)
- Two main loan portfolios: CRE* and RRE** loans
  - Different definitions of CRE and RRE
  - Combination of granular data allows for multiple definitions
  - Large reconciliation possible with current information
- Coverage:
  - CRE loans are captured (missing loans to natural persons for RRE)
  - Large coverage of main variables required to calculate the indicators
  - Many of the proposed breakdowns
  - All required distributions, indicator metrics and data types (flow/stock)
- AnaCredit allows analysing in detail the portfolio of CRE loans
  - Large set of indicators
  - Correlation with other indicators
  - Ex-post definition of indicators – not constrained to a fixed template

* CRE: Commercial real estate
** RRE: Residential real estate
## ESRB indicator concepts vs AnaCredit mapping

<table>
<thead>
<tr>
<th>ESRB indicator concepts</th>
<th>AnaCredit mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lending – current</td>
<td>Outstanding nominal amount</td>
</tr>
<tr>
<td>Lending – at origination</td>
<td>Commitment amount at inception, off-balance sheet amount (requires estimate for credit lines)</td>
</tr>
<tr>
<td>Property value – current</td>
<td>Protection value, type of collateral</td>
</tr>
<tr>
<td>Property value – at origination</td>
<td>Original protection value, type of collateral</td>
</tr>
<tr>
<td>Maturity – at origination</td>
<td>Settlement date, legal final maturity date</td>
</tr>
<tr>
<td>Investment in CRE</td>
<td>Out of scope</td>
</tr>
<tr>
<td>Non-performing loans</td>
<td>Performing status of the instrument</td>
</tr>
<tr>
<td>Loan-loss provisions</td>
<td>Accumulated impairment</td>
</tr>
</tbody>
</table>

## ESRB break downs vs AnaCredit mapping

<table>
<thead>
<tr>
<th>ESRB break downs</th>
<th>AnaCredit mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property type</td>
<td>Type of protection (less detail in AnaCredit)</td>
</tr>
<tr>
<td>Property location</td>
<td>Real estate collateral location (Analyst must identify prime locations)</td>
</tr>
<tr>
<td>Lender type</td>
<td>Economic activity</td>
</tr>
<tr>
<td>Lender nationality</td>
<td>Address: country</td>
</tr>
<tr>
<td>Investor type</td>
<td>Economic activity</td>
</tr>
<tr>
<td>Lender nationality</td>
<td>Address: country</td>
</tr>
<tr>
<td>Property under development</td>
<td>Purpose with the value Construction investment</td>
</tr>
</tbody>
</table>
Exploring indicators from the top down

- **Loan-to-value**
  - Different definitions can be specified
    - What is a loan? (outstanding amount, carrying amount?)
    - What is value? (protection value, amount of protection that secures the loan?)
      - By type of protection: Financial / real estate / other
    - What time? (current, origination?)
  - Defined at loan level –
    Focus of analysis can be defined ex-post based on available details:
    - Groups of entities
    - Location (creditor, debtor, real estate)
    - Performance

- **Distribution**
  - Focus on the least secured (highest loan-to-value) entities/portfolios
    - Tail of the distribution
  - Joint distribution
    - Correlation with other relevant indicators, e.g. non-performing loans
Future extensions

- Combine with information from other datasets
  - Granular data (SHSDB, CSDB)
  - Individual basis (e.g. iBSI, FINREP, COREP)

- Complete balance sheet*
  - Comprehensive view of risks taken by the bank
    + Off-balance sheet items, e.g. loan commitments, guarantees provided
    + Derivatives
  - Sources of finance and leverage

- Enlarge the scope*
  - Shadow banking
  - Other relevant counterparties, e.g. natural persons

* Not planned, based on user needs
Conclusion

- **Granular data** captures the behaviour of economic agents closer to reality

- **Macroprudential analysis** can benefit in particular from
  - The higher level of *detail*
  - The ability to trace and construct *networks of counterparties*
  - The possibility to analyse full *distributions* of indicators

- **Granular data** alleviates discrepancy between different *definitions*

- Many economic & financial *indicators* can be constructed with AnaCredit
  - Drill-downs and distributions provide important *insights for analysis* where averages are insufficient and dispersion measures are needed
Annexes
Conceptual model
Logical data model

• 6 entity tables with one or more datasets each

  Instrument entity table
  instrument data, financial data, accounting data

  Protection entity table
  protection received data

  Instrument-protection received entity table
  instrument-protection received data

  Counterparty reference data entity table
  counterparty reference data

  Counterparty risk/default entity table
  counterparty risk data, counterparty default data

  Counterparty-instrument entity table
  counterparty-instrument data, joint liabilities data