Dis-entangling the mortgage arrears crisis: The role of the labour market, income volatility and negative equity

Yvonne McCarthy
Central Bank of Ireland

Irish Economy Conference
Institute of Bankers, February 25th 2015
Disclaimer

- In what follows, I am speaking as a researcher; my views are not necessarily representative of:
  - The Irish Central Bank
  - The ESCB
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The Crisis: Mortgage Arrears (PDH, 90+dpd)
So has the problem been solved?

- **Long-term arrears still high**
  - 59,365 accounts 360+dpd at end-September 2014 (8%)
  - 37,484 accounts 720+dpd at end-September 2014 (4.9%)
  - Outstanding balance on accounts in 720+dpd status is €8.06 billion (total PDH book is €105.5 billion)
  - Suggests there’s more to be done - need to understand more about arrears cases
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- Existing literature on causes of arrears
  - Data used for Irish analysis
  - Descriptive overview of Irish mortgage arrears
    - Household characteristics
    - Labour market profile
    - Income and mortgage repayment burdens
    - Mortgage characteristics
- Modelling approach and results
- Concluding comments
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What Drives Mortgage Arrears? The Literature

Housing Equity
- Mortgage as an option contract
- Driven by negative equity

Ability-to-Pay
- Cashflow problems (Income)
- Job loss, illness, separation

➤ ‘Double trigger’ hypothesis: some combination of both factors
  ➤ Foote et al. (2008), Bhutta et al. (2011), Lydon and McCarthy (2013)

➤ However, existing studies proxy for affordability shocks using aggregate measures (e.g. regional unemployment)
  ➤ May underestimate the impact (Gyourko and Tracy (2013))
  ➤ The true relationship is likely to be more complex
  ➤ In Irish case - lots of changes in the labour market not yet accounted for

➤ We use data with borrower specific information on affordability shocks
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CBI, Mortgage Arrears, February 25, 2015
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Number of Mortgages Issued in the Irish Market
Real Irish House Prices: 1990 - 2012
Unemployment Rate

% of labour force

But is there more to the story?

- 2004-2006: Approx. 340,000 mortgages approved
  - Eased credit conditions; strong economy; incomes growing
  - Since then....

- Impact of the economic and financial crisis on the labour market has been dramatic
  - Marked reductions in labour income (Callan et al. (2013))
  - Increase in involuntary part-time work
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- How important are these factors for Irish mortgage arrears?

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- Two related data sets used:
  1. Loan level data collected for PCAR and
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- Loan level data:
  - Snap shot at June 2012
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- Crucially, both datasets can be linked
  - 88% gave permission for linking
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OVERVIEW OF ARREARS
# Household Characteristics (1)

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<th>No Arrears (%)</th>
<th>Any Arrears (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head of Household (HOH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>56.1</td>
<td>55.6</td>
</tr>
<tr>
<td>Age: 25-54 years</td>
<td>85.7</td>
<td>89.0</td>
</tr>
<tr>
<td>Marital Status (HOH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>13.1</td>
<td>10.4</td>
</tr>
<tr>
<td>Married</td>
<td>81.0</td>
<td>81.1</td>
</tr>
<tr>
<td>Widowed/Divorced</td>
<td>5.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Dependent Children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has Children</td>
<td>81.7</td>
<td>88.4</td>
</tr>
<tr>
<td>Education Status (HOH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower 2nd Level</td>
<td>9.4</td>
<td>22.0</td>
</tr>
<tr>
<td>Upper 2nd Level &amp; Non-Degree</td>
<td>41.9</td>
<td>49.4</td>
</tr>
<tr>
<td>3rd Level Degree</td>
<td>47.7</td>
<td>28.1</td>
</tr>
<tr>
<td>N</td>
<td>1,042</td>
<td>164</td>
</tr>
</tbody>
</table>
## Household Characteristics (2)

<table>
<thead>
<tr>
<th>Labour Market Characteristics</th>
<th>No Arrears (%)</th>
<th>Any Arrears (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Status (HOH)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>3.6</td>
<td>14.6</td>
</tr>
<tr>
<td>Inactive</td>
<td>8.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Employed</td>
<td>88.1</td>
<td>75.0</td>
</tr>
<tr>
<td>Employment Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permanent Contract</td>
<td>86.4</td>
<td>75.6</td>
</tr>
<tr>
<td>Job Tenure &lt;2yrs</td>
<td>6.2</td>
<td>16.2</td>
</tr>
<tr>
<td>Previously Unemployed</td>
<td>8.1</td>
<td>19.5</td>
</tr>
<tr>
<td>Fragile Employment</td>
<td>25.0</td>
<td>40.0</td>
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<tr>
<td>N</td>
<td>1,042</td>
<td>164</td>
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### Affordability and Housing Equity

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<th>No Arrears (%)</th>
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<tbody>
<tr>
<td><strong>Median Income</strong></td>
<td>Euros</td>
<td>65,000</td>
</tr>
<tr>
<td><strong>Median MRTI Ratio</strong></td>
<td>% of Gross Income</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Housing Equity</strong></td>
<td>Negative</td>
<td>36</td>
</tr>
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<td><strong>N</strong></td>
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### Affordability Shocks

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<td><strong>Income Change (past year)</strong></td>
<td></td>
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<tr>
<td>Significant Fall</td>
<td>33.7</td>
<td>51.8</td>
</tr>
<tr>
<td>Moderate Fall</td>
<td>35.0</td>
<td>28.1</td>
</tr>
<tr>
<td>No Change</td>
<td>23.7</td>
<td>15.9</td>
</tr>
<tr>
<td>Moderate Increase</td>
<td>5.9</td>
<td>1.8</td>
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<td>Significant Increase</td>
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<td>1.8</td>
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<td><strong>Labour Market</strong></td>
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<td>Deterioration in Employment</td>
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<td>64.9</td>
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Summary

- Distressed borrowers quite different from performing borrowers

- Differences along a number of dimensions:
  - Affordability (Income and MRTI)
  - Housing equity
  - Labour market characteristics and shocks

- Next step: Assess importance of these factors in a multivariate setting
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Model of Arrears

\[ Pr(Arrears = 1) = F(\beta'x_i + \epsilon_i), i = 1, 2, \ldots, n \]

Where: The dependent variable is “Any Arrears at June-12”, \( x \) comprises controls for the \( ith \) household’s characteristics and financial information, \( \beta \) is a set of parameters to be estimated and \( \epsilon_i \) is the error term.
AFFORDABILITY AND EQUITY
## Probability of Arrears - Regression Results

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<th>Dependent Variable = Any Arrears</th>
<th>Marginal Effect</th>
<th>Std. Error</th>
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<td>Log Current LTV</td>
<td>0.08***</td>
<td>0.0241</td>
</tr>
<tr>
<td>Log Household Income</td>
<td>-0.08***</td>
<td>0.0257</td>
</tr>
<tr>
<td>Log MRTI</td>
<td>0.05**</td>
<td>0.0233</td>
</tr>
<tr>
<td>Log Outstanding Debt</td>
<td>-0.03</td>
<td>0.0265</td>
</tr>
<tr>
<td>Buy-to-Let</td>
<td>0.10***</td>
<td>0.0410</td>
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<tr>
<td>SVR Mortgage</td>
<td>0.07***</td>
<td>0.0217</td>
</tr>
<tr>
<td>Fixed Rate Mortgage</td>
<td>-0.02</td>
<td>0.0259</td>
</tr>
<tr>
<td>Equity Release</td>
<td>0.05**</td>
<td>0.0219</td>
</tr>
<tr>
<td>Male</td>
<td>-0.01</td>
<td>0.0180</td>
</tr>
<tr>
<td>Age: 35-44</td>
<td>-0.01</td>
<td>0.0256</td>
</tr>
<tr>
<td>Age: 45-54</td>
<td>0.05*</td>
<td>0.0331</td>
</tr>
<tr>
<td>Age: 55-64</td>
<td>-0.02</td>
<td>0.0351</td>
</tr>
<tr>
<td>Age: 65+</td>
<td>-0.01</td>
<td>0.0576</td>
</tr>
<tr>
<td>Medium Education</td>
<td>-0.05**</td>
<td>0.0249</td>
</tr>
<tr>
<td>High Education</td>
<td>-0.08***</td>
<td>0.0282</td>
</tr>
<tr>
<td>Widowed/Divorced/Separated</td>
<td>0.03</td>
<td>0.0414</td>
</tr>
<tr>
<td>Single</td>
<td>-0.03</td>
<td>0.0287</td>
</tr>
<tr>
<td>Dependent Children</td>
<td>0.05**</td>
<td>0.0215</td>
</tr>
</tbody>
</table>

- N 1,179
- LR chi² 177.47
- Prob>chi² 0.0000
- Pseudo R² 0.1888

**Note:** *** Significant at 1 per cent level; ** Significant at 5 per cent level; *
* Significant at 10 per cent level. Omitted categories for dummy variables are:
  Interest Rate-Tracker; Age: 25-34 yrs; Low Education and Married.
LABOUR MARKET AND SHOCKS
Incorporating Labour Market Information

<table>
<thead>
<tr>
<th>Dependent Variable=Any Arrears</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>0.09**</td>
<td>0.0546</td>
<td></td>
</tr>
<tr>
<td>Inactive</td>
<td>0.03</td>
<td>0.0424</td>
<td></td>
</tr>
<tr>
<td>Fragile Employment</td>
<td>0.05**</td>
<td>0.0264</td>
<td></td>
</tr>
<tr>
<td>Recently Unemployed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longer Term Unemployed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment Deterioration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| N                             | 1,179   | 1,179   | 1,179   |
| LR chi²                       | 184.35  | 184.40  | 185.38  |
| Prob>chi²                     | 0.0000  | 0.0000  | 0.0000  |
| Pseudo R²                     | 0.1961  | 0.1962  | 0.1972  |

**Note:** *** Significant at 1 per cent level; ** Significant at 5 per cent level; * Significant at 10 per cent level.
Incorporating Income Shocks

<table>
<thead>
<tr>
<th>Dependent Variable=Any Arrears</th>
<th>Marginal Effect</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>0.09**</td>
<td>0.0548</td>
</tr>
<tr>
<td>Inactive</td>
<td>0.03</td>
<td>0.0428</td>
</tr>
<tr>
<td>Fragile Employment</td>
<td>0.05**</td>
<td>0.0264</td>
</tr>
<tr>
<td>Significant Income Drop</td>
<td>0.03*</td>
<td>0.0191</td>
</tr>
</tbody>
</table>

| N                               | 1,175           |
| LR chi²                         | 189.41          |
| Prob>chi²                       | 0.0000          |
| Pseudo R²                       | 0.2025          |

Note: *** Significant at 1 per cent level; ** Significant at 5 per cent level; * Significant at 10 per cent level.
## Incorporating Household Wealth

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Marginal Effect</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>0.07*</td>
<td>0.0515</td>
</tr>
<tr>
<td>Inactive</td>
<td>0.02</td>
<td>0.0394</td>
</tr>
<tr>
<td>Fragile Employment</td>
<td>0.04**</td>
<td>0.0254</td>
</tr>
<tr>
<td>Regular Saver</td>
<td>-0.03*</td>
<td>0.0191</td>
</tr>
<tr>
<td>Has Unsecured Debt</td>
<td>0.03**</td>
<td>0.0170</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>1,163</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR chi²</td>
<td>189.68</td>
</tr>
<tr>
<td>Prob&gt;chi²</td>
<td>0.0000</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.2060</td>
</tr>
</tbody>
</table>

**Note:** *** Significant at 1 per cent level; ** Significant at 5 per cent level; * Significant at 10 per cent level.
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- To date, not possible to explore the interactions between borrowers’ labour market experience and mortgage arrears
- Results confirm importance of unemployment and housing equity - supports previous research
- But, new insights on importance of other factors:
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  - Fragile employment
  - Unemployment duration
- Policy implications?
  - Need to strengthen overall labour market conditions / job security and target long-term unemployment
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THANK YOU