The Quantitative Impact of Energy Efficiency on Values and Risk of Residential Mortgages

Results of the EEFIG Working Group on Risk Assessment

The EEFIG Working Group on risk assessment of energy efficient loans has released its final report

December 2020 — **Submitted Intermediary results report of the working group, including:**
- Overview of knowledge base and identified relevant initiatives
- Progress on work in national hubs and the methodology hub
- Outline of target activities for working group in 2021

January-February — **Identified "landing points" for report key points and where the WG results can be useful**

February 2021 — **Development on issues paper on emerging conclusions**

7th July 2021 — **Draft final report was submitted to the EC for review**

November 2021 — **Final Report**

DG ENERGY

LAUNCH AND FACILITATE THE IMPLEMENTATION OF A NEW EEFIG WORKING GROUP ON "RISK ASSESSMENT: THE QUANTITATIVE RELATIONSHIP BETWEEN ENERGY EFFICIENCY IMPROVEMENTS AND LOWER PROBABILITY OF DEFAULT OF ASSOCIATED LOANS AND THE INCREASED VALUE OF THE UNDERLYING ASSETS"

Main authors
Peter Sweatman (EEFIG rapportier), Carsten Glenting, Daire McCoy, Markus Seifert.

EEFIG website
https://ec.europa.eu/eefig/index_en

Join EEFIG
https://ec.europa.eu/eefig/join-us_en

→ https://ec.europa.eu/eefig/eefig-working-group-risk-assessment_en

Key questions

1. To what extent is asset energy performance correlated with credit risk and loan arrears?

2. How does this vary by observed factors such as asset owner income or employment/business status and wider macroeconomic conditions?

3. How does this vary within EU member states?

4. Is there evidence of a causal link between improved asset energy performance and improved default risk?

EEFIG
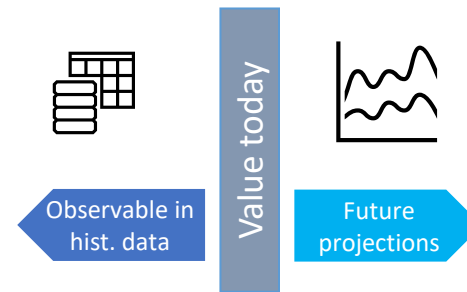ENERGY EFFICIENCY
FINANCIAL INSTITUTIONS GROUP

Values | The Working Group performed a large-scale meta-analysis of existing data, evidence, and publications

**For banks, credit risk impacts the value of transactions**

Face value — Risk

Risk-adjusted value
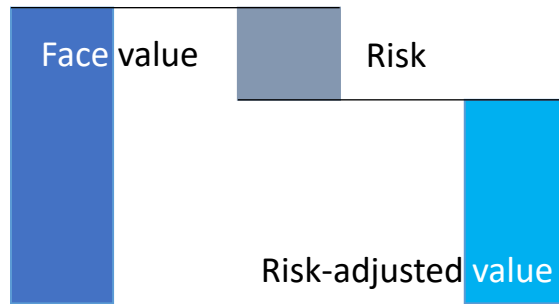
Not all effects might be observable already today

Value today

Observable in hist. data | Future projections

Extensive meta analysis of existing analyses on property value

Sources: Estimates retrieved from Brounen (2011), Hyland et al. (2013), Fuerst et al. (2015), Chegut (2016), Aydin et al. (2020), Nationwide Building Society (2020), Evangelista et al. (2019), Taltavull et al. (2020), Cajias et al. (2016) and Fuerst et al. (2016; 2020). The Y-axis is the percentage premium for EPC (A/B/C) over EPC (E/F). The Box charts show the range of estimates (lowest value, typical values, mean value and highest value).

~ 5%

□ Sales Premium (NL, IE, PT, RO, UK)   ■ Rent Premium (IE, DE, UK)
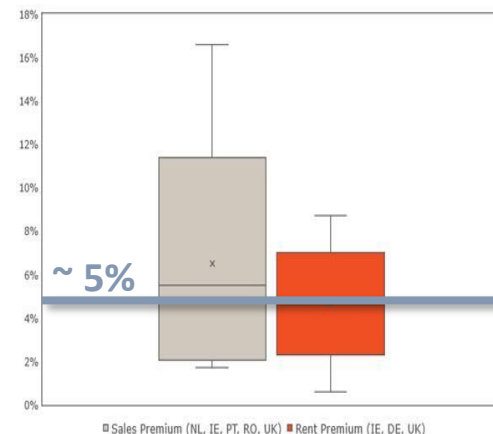
Impact

1. Most efficient properties can attract a market price premium of up to 10% in value, and approx. 5% for rentals, compared to equivalent least efficient or non-rated properties.

2. Several studies also find less liquidity for the lowest rated buildings.

3. Several recent studies confirm the JRC findings of an observed increase of 3-8% in the sale price of residential assets resulting from EE improvements as well as an increase of around 3-5% in residential rents compared to similar properties.

EEFIG
ENERGY EFFICIENCY
FINANCIAL INSTITUTIONS GROUP

3 case studies with real data on defaults & arrears…

…and controlling for the effects of e.g.

Household income
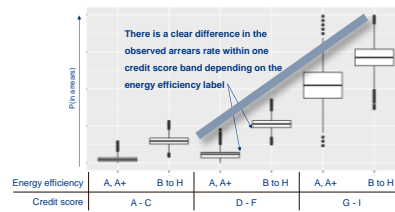
Loan term

Valuation

LTV

Year of construction

Recession, unemployment

Credit score, IRB score

Borrower age

results in

**Allianz Baufinanzierung** – better energy efficiency leads to lower likelihood of being in arrears

There is a clear difference in the observed arrears rate within one credit score band depending on the energy efficiency label

Sample size 35k mortgages

OP Financial better energy efficiency leads to lower likelihood of being in arrears for retail mortgages
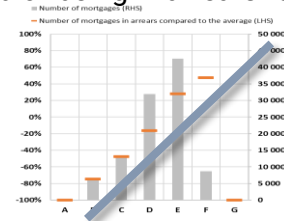
Sample size 102k mortgages

Nationwide Building Society successfully tested the inclusion of EE in IRB capital models

-12%
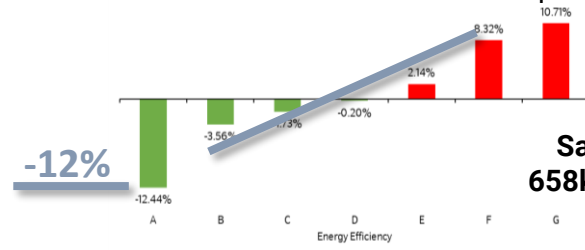
Sample size 658k mortgages

Impact

1. Clear statistical relationship between energy performance of the collateral and credit risk of the associated loan

2. Financial institutions should tag loan collateral and underlying assets based on their energy performance.

3. Financial institutions should analyze their own portfolios to better manage credit risks and capital allocations.

4. Mortgage lenders running IRB models should consider energy efficiency as a risk factor in them .

FINANCE UNEP INITIATIVE

Conclusions | The working group's report substantially informs supervisory authorities across Europe

- This WG uncovered and robustly assessed new evidence from a large sample of mortgages across several countries in Europe to **conclude that there is a statistically significant correlation between the energy performance of building collateral and mortgage credit performance**.

- The primary analysis of this WG was conducted using the residential mortgage books of Nationwide Building Society (NBS) in the UK, Allianz in Germany and OP Financial Group in Finland.

- In total, the analysis was conducted on a sample of **almost 800,000 residential mortgages** across three countries. A forward-looking analysis was undertaken in each case controlling for different borrower credit scores, incomes, loan terms, loan-to-value ratios, along with a range of variables relating to the building and additional controls capturing municipality-level economic and the broader economic indicators.

- Energy performance data came from a combination of domestic energy performance certificates (EPCs) registers (where available) and proxy models based on energy demand or characteristics of the building.

Report officially published by the European Commission
(April 8th 2022)

EBA discussion paper on the role of environmental risk in the prudential framework
(May 2nd 2022)

Thanks a lot to the WG's main contributors

<u>Peter Sweatman</u>, Chief Executive at Climate Strategy & Partners
Markus Seifert, Partner at d-fine
Carsten Glenting, Head of Strategy, Economics and Finance at Viegand Maagøe A/S
Dinne Smederup Hansen, Climate change consultant at COWI A/S
Daire McCoy, Assistant Professorial Research Fellow at Grantham Research Institute on Climate Change & the Environment
Zsolt Jaczko, Head of Retail IRB Modelling at Nationwide Building Society
Cesar Benedi Bozalongo, Risk Manager (IRB Modelling) at Nationwide Building Society
Ville Satka, Senior Data Analyst at OP Financial Group
Benjamin Langer, Zertifizierter Sachverständiger für Immobilienbewertung at Allianz Lebensversicherungs-AG
Axel Ehrmann, CRO Baufinanzierung Deutschland at Allianz Lebensversicherungs-AG