Green Mortgages

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Main Takeaways

- Research question:

  What are the key features of green mortgages in the U.K. residential mortgage market?

- Baseline findings:

Owner-occupied	Buy-to-let (BTL)

• Preferential rate
   • (Lower payments over the introductory period)
   • ΔNPV: £774 ~ 3,009
• **Cash back**
   • (A lump sum benefit at loan origination)
   • ΔNPV: £211 ~ 241
	• **Preferential rate**
	   • (Lower payments over the introductory period)
	
	• Cash back
	   • (A lump sum benefit at loan origination)

- A large share of the effect is driven by cross-bank variations

Main Takeaways

- Research question:

  What are the key features of green mortgages in the U.K. residential mortgage market?

- Channels:

  - Risk-related channel I: Cash-flow channel ✗
    - Rationale: Green property owners have better liquidity conditions given their lower energy bills
    - Empirical findings: Green mortgage rate does not reduce by more during a period with high uncertainty

  - Risk-related channel II: Collateral value channel ✗
    - Rationale: Green properties have higher value
    - Empirical findings: Green mortgage rate does not reduce by more for high-LTV loans

  - Customer acquisition channel ✓
    - Rationale: Lenders offer green mortgages to expand product menu & attract customers
    - Empirical findings: preferential green product are more likely offered to home buyers than to refinanciers

What I Appreciate Most

- **Important research question**
  - Households and residential buildings play a crucial role in the transition to net-zero economy:
    - ‣ 22% of the global energy consumption and 17% of the CO_2 emissions
  - Energy-efficient homes are immediately beneficial, e.g.:
    - ‣ Energy-efficient windows can save the average homeowner up to $583 per year, and LED bulbs save the average household about $225 per year.
    - ‣ If 1/10 households use energy-efficient heating and cooling equipment, we would avoid 13 billion pounds of carbon emissions each year, the equivalent of running 1.2 million cars.

      (Source: https://www.ecowatch.com/energy-efficiency-stats.html)

  - Limited academic understanding about financing green homes
    - ‣ Financing firm green investments: Flammer (2021), Houston & Shan (2022), Wang (2023), …
    - ‣ General credit constraints on green investments: Berkouwer & Dean (2022), Adelino & Robinson (2023), …
    - ‣ *This paper:* preferential bank credit provision to household green investments
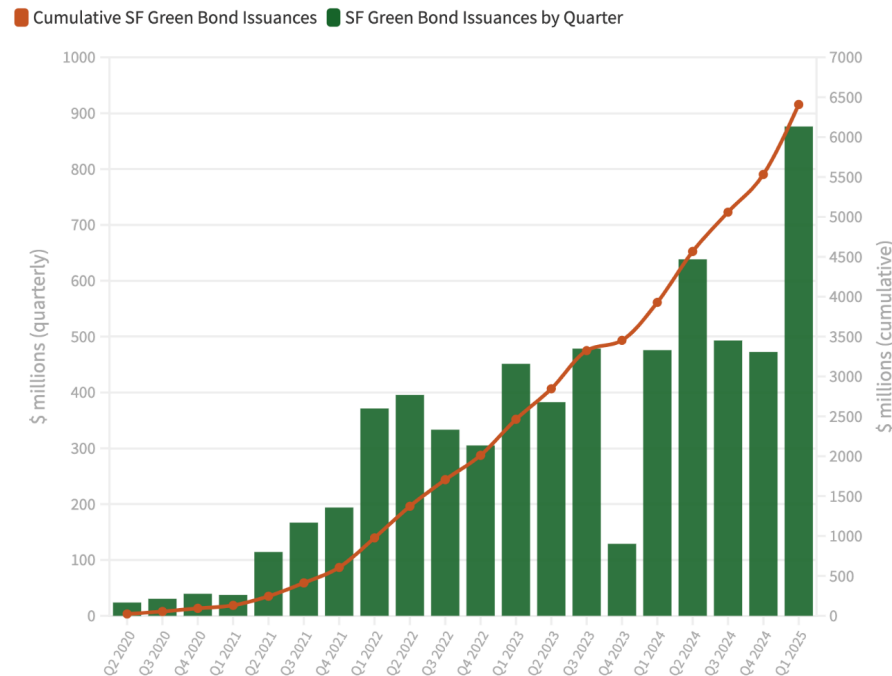
What I Appreciate Most

- Granular data
  - The universe of mortgage product menus
    - ‣ Revealing the supply side
  - High-frequency quotations with detailed loan characteristics
    - ‣ Enables within-lender-loan-type comparisons
    - ‣ A variety of pricing metrics
  - Explicit green labels
- Comprehensive channel explorations
  - Risk-related channel: ruled out
    - ‣ A fundamental channel that is commonly considered in the literature
  - Customer acquisition channel: corroborated
    - ‣ An important lender incentive in the retail market

Comment 1. A "Cost of Fund" Channel?

■ Growing green mortgage securitization

(Source: Fannie Mae)

■ Seemingly preferential market rate

(Devine, Avis, and Meagan McCollum. "Advancing energy efficiency through green bond policy: Multifamily green mortgage-backed securities issuance." Journal of Cleaner Production 345 (2022): 131019.)

Single-Family Green Bond Issuances

■ Cumulative SF Green Bond Issuances ■ SF Green Bond Issuances by Quarter

	(1) Rate	(2) Rate
Green bond (d)	−0.19288*** (0.00828)	
Brown with Green Certification		−0.09667*** (0.03468)
Green Certification program		−0.11895*** (0.01989)
Green Rewards program		−0.20057*** (0.00865)

Comment 1. A "Cost of Fund" Channel?

- Mechanism:
  - Investors may have WTP for ESG
    - E.g., Baker et al. (2022), Giglio et al. (2023), Starks (2023), …

    ⇓
  - Banks may face lower cost of fund for green assets
    - E.g., Devine et al. (2022)

    ⇓
  - Banks are willing to offer preferential prices for green mortgages

- Potential tests:
  - *Does the green mortgage discount correlate with price fluctuations of green MBS?*

Comment 2. A "Bank ESG Preference" Channel

- **Banks may also be under pressure of pursuing ESG**
  - E.g., Houston & Shan (2022), Wang (2023), …

- **Consistent with the findings that:**
  - Lender FE explains a substantial share of the effect

- **Potential tests:**
  - Measure each bank's ESG stance
    - E.g., textual analyses on bank public statements
  - *Are cross-bank variations in the green discount correlated with their ESG preferences?*

Comment 3. More about the Risk Channel

- Not only about the risk level, but also the correlation:
  - Green housing costs might be less correlated with energy cost fluctuations
  - Green properties might be more resist to extreme weather/ natural disasters
- Potential tests:

  (Assumption: if bank loan pricing is affected by the salience of risk)

  Do banks offer more preferential green mortgage rates:
  - *when energy costs are higher (time-series variations)?*
  - *in areas more exposed to extreme weather/ natural disasters (cross-sectional and time-series variations)?*

Comment 3. More about the Risk Channel

- Potential matching between households/properties and green, e.g.:
  - Green properties are newer (Table 1)
  - Owners of green properties may face less liquidity constraints (Dröes & Van Der Straten, 2024)
  - Green properties may have higher market value

- Potential tests:
  - *Step 1.* Estimate the conditional probability distribution:
  $Prob(feature|green)$
  (Perhaps using survey or housing deeds data)
  - *Step 2.* Estimate a holistic pricing model:
  $\widehat{Price} = f(\boldsymbol{features})$
  (Perhaps using the Product Sales Data)
  - *Step 3.* Estimate the green price effect

	Houses		Units	
The price premium of EE homes compared to non-EE homes, Australia				
Year	% price difference	$ price difference	% price difference	$ price difference
2024	14.50%	$112,000	11.70%	$70,000
2023	15.80%	$110,000	13.80%	$75,000
2022	17.90%	$129,300	11.40%	$65,000
2021	14.10%	$90,000	13.60%	$75,000
2020	12.60%	$75,000	14.80%	$80,000
2019	17.00%	$92,375	17.50%	$85,000

Source: Domain Sustainability in Property Report 2024

Comment 4. More about the Customer Acquisition Channel

- A potential test in addition:
  - Do banks offer more preferential green products in high-competition areas/segments?
  - How about when they enter new markets?

- A more direct test for customer flow:
  - Any chance to get data about which products that borrowers click?

- Are the preferential offers realized?
  - Yes: customers are attracted → preferential green loans are originated
  - No : customers are attracted → expensive loans are originated
  - Any chance we can observe (even aggregate-level) statistics about the originated loans?

Discussion for Cocco, Mendes, and Naaraayanan (2025)

Conclusion

- Green mortgages are offered with preferential pricing
  - Shed new light to the literature: financial support for green investments by **households**
  - Unique data: universe of the mortgage products on offer, detailed loan chars.
  - Channel analyses: empirical findings supporting the customer attraction channel, not the risk channel

- More could be potentially explored about the channels
  - Mortgage securitization and investor preferences
  - Bank preferences
  - More about risk
  - More about customer attraction

Look forward to the published version!