

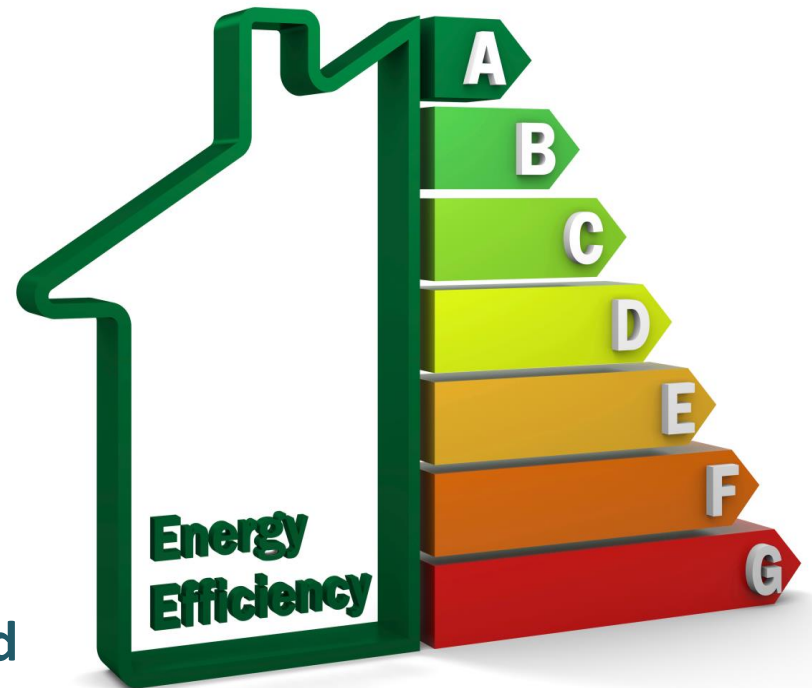


The Price Effect of Building Energy Ratings in the Dublin Residential Market

IEPPE Conference, Berlin
11th September 2014

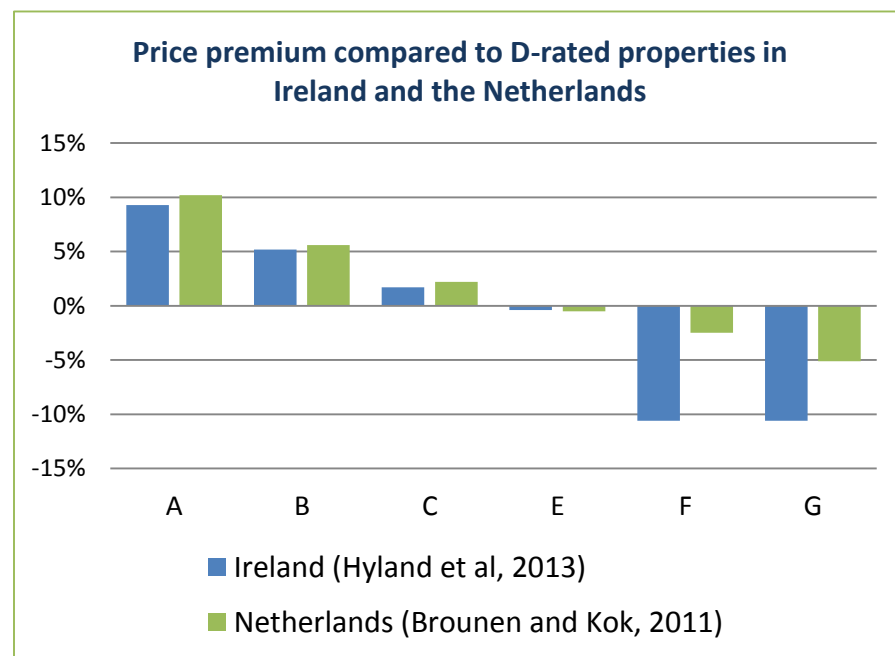
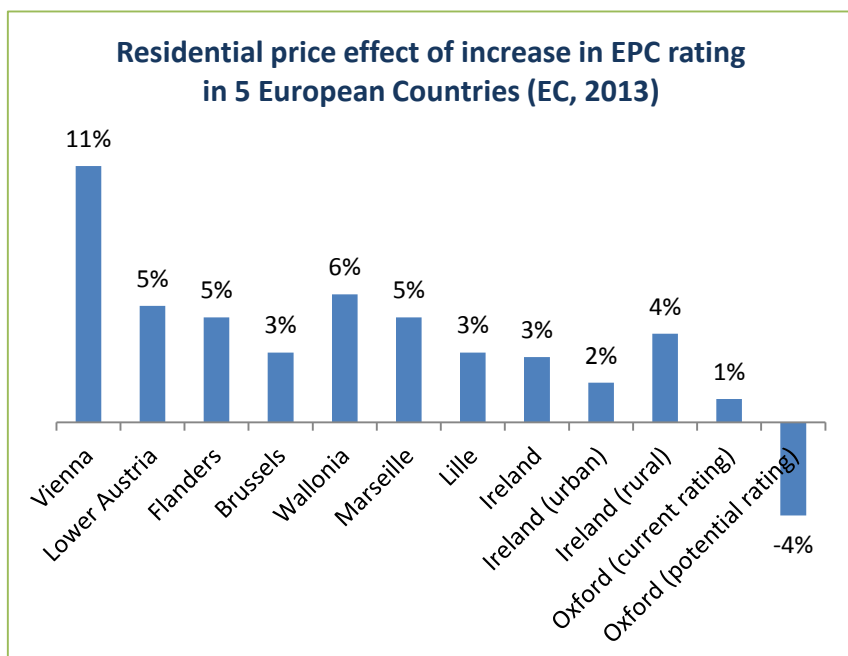
Sarah Stanley

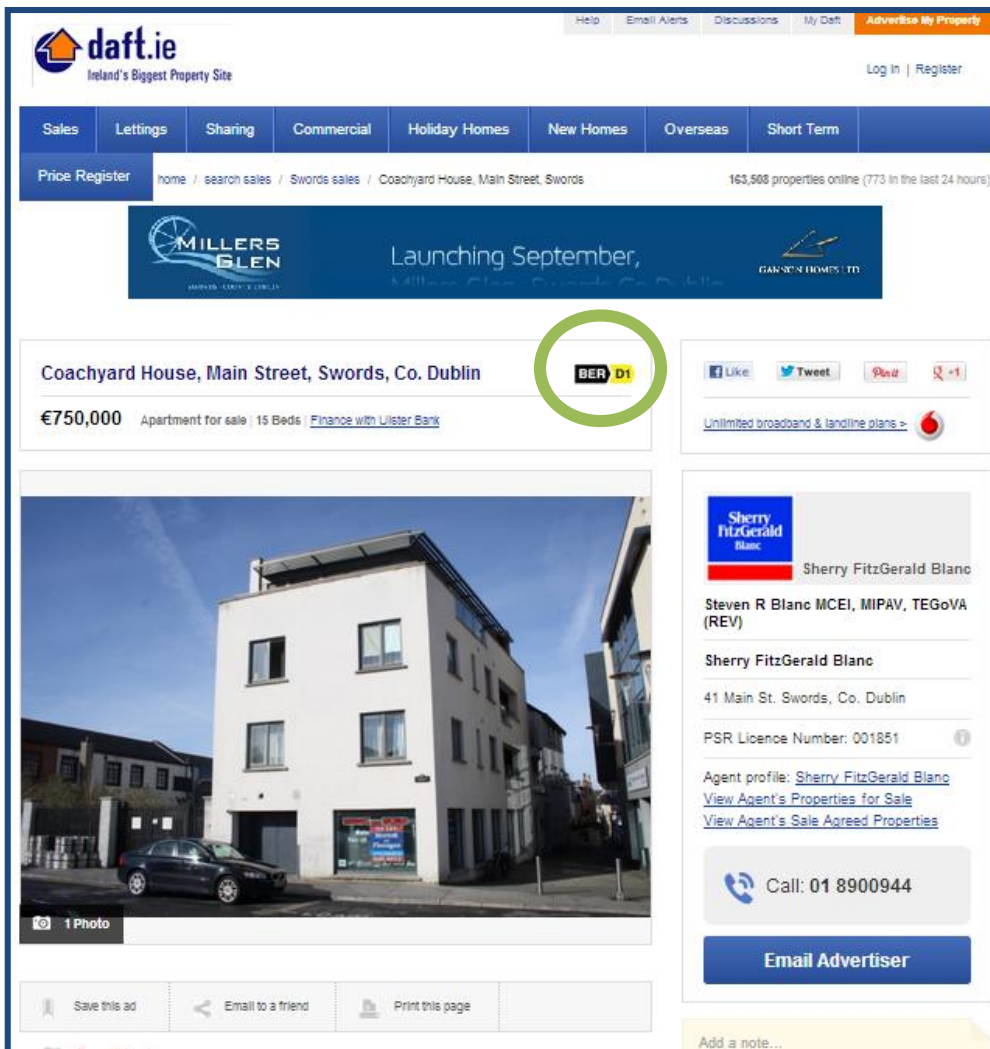
ESRI/SEAI Fellow
Energy Modelling Department
Sustainable Energy Authority of Ireland



- Global action to reduce emissions (Kyoto protocol), EU Climate and Energy Policy: carbon, efficiency, renewables targets.
- Enhancing efficiency in buildings - 2002 EU Energy Performance in Buildings Directive (recast 2010); EPCs (BERs) required for buildings for sale or for rent.
- Present study: Empirical relationship between BER and sales price of residential buildings in Dublin market (2009-2014)
- Research approach: literature review, Irish context, hedonic model, model results, practical application, future research

- Range of price premiums from “efficient” certified buildings:
 - 13% to 30% in commercial sector
 - 1% to 11% in residential sector





daft.ie
Ireland's Biggest Property Site

Home / search sales / Swords sales / Coachyard House, Main Street, Swords

163,508 properties online (773 in the last 24 hours)

Coachyard House, Main Street, Swords, Co. Dublin

€750,000 Apartment for sale | 15 Beds | Finance with Ulster Bank

BER D1

Sherry FitzGerald Blanc
Steven R Blanc MCEI, MIPAV, TEGoVA (REV)

Sherry FitzGerald Blanc
41 Main St. Swords, Co. Dublin
PSR Licence Number: 001851

Agent profile: [Sherry FitzGerald Blanc](#)
[View Agent's Properties for Sale](#)
[View Agent's Sale Agreed Properties](#)

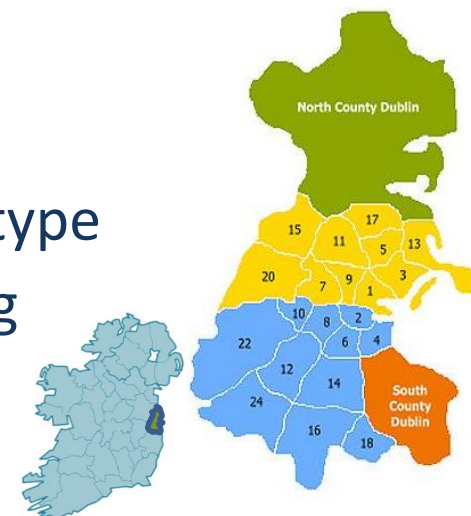
Call: 01 8900944

Email Advertiser

2,780 residential properties from Daft.ie (2009-2014)

Contains information on:

- sales price
- location (25 districts)
- time period advertised
- size (m²)
- age
- dwelling type
- BER rating



DEAP Version X,Y

Building Energy Rating (BER)

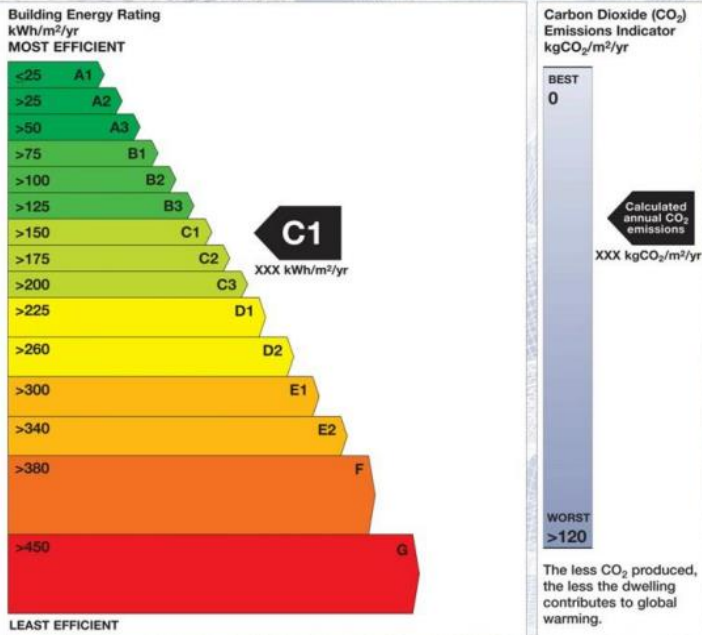
BER for the building detailed below is: **C1**

Name of House, Street Name One, Street Name Two, Town Name One, Town Name Two, County name One, County name Two,

BER Number: XXXXXXXXXX
 Date of Issue: Day Month Year
 Valid Until: Day Month Year
 BER Assessor No.: XXXX
 Assessor Company No.: XXXX

The Building Energy Rating (BER) is an indication of the energy performance of this dwelling. It covers energy use for space heating, water heating, ventilation and lighting, calculated on the basis of standard occupancy. It is expressed as primary energy use per unit floor area per year (kWh/m²/yr).

'A' rated properties are the most energy efficient and will tend to have the lowest energy bills.



Rating	Energy Use (kWh/m ² /yr)	CO ₂ Emissions (kgCO ₂ /m ² /yr)
A1	<25	
A2	>25	
A3	>50	
B1	>75	
B2	>100	
B3	>125	
C1	>150	XXX
C2	>175	
C3	>200	
D1	>225	
D2	>260	
E1	>300	
E2	>340	
F	>380	
G	>450	

IMPORTANT: This BER is calculated on the basis of data provided to and by the BER Assessor, and using the version of the assessment software quoted above. A future BER assigned to this dwelling may be different, as a result of changes to the dwelling or to the assessment software.

- BER – mandatory for buildings for sale or rent since 2009
- Based on building structure, age, heating, ventilation and lighting
- 15-point rating scale from G to A1
- Associated Energy Performance Indicator (EPI) – kWh/m²/yr
- Accompanied with Advisory Report
- Assessors registered with SEAI (€100-€250 per assessment)
- Certificates administered by SEAI
- Valid for up to 10 years

YOUR BUILDING

- > **Building Energy Rating**
 - Advertising of BER
 - National BER Research Tool
 - BER FAQ Search
 - Legislation and Background
 - Disclaimer
 - BER Contact Info
 - Whistleblower Policy

Join Our Mailing List 

A Guide to Building Energy Rating for Homeowners

Download our Guide to Building Energy Rating for Homeowners to find out more about what it is and who requires one.

[A Guide to Building Energy Rating for Homeowners](#)



MEMBERS OF THE PUBLIC

- > [What is a BER?](#)
- > [Who needs a BER?](#)
- > Example [Domestic](#) and [Non Domestic](#) BERs
- > [What is the cost of a BER?](#)
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ASSESSORS

- > [Domestic BER assessors](#)
- > [Non Domestic BER assessors](#)
- > [Display Energy Certificate \(DEC\) assessors](#)
- > [Code of Practice](#)
- > [Dwelling Energy Assessment Procedure \(DEAP\)](#)
- > [SBEM Software](#)
- > [HARP database](#)
- > [Domestic BER Technical Bulletins](#)
- > [Non-Domestic BER Technical Bulletins](#)

BER EXPLAINED



Find out what a BER is and how one is assessed.

BER STATISTICS



Information on number of BERs published.

FIND A BER OR DEC ASSESSOR



Register of BER or DEC Assessors in your area.

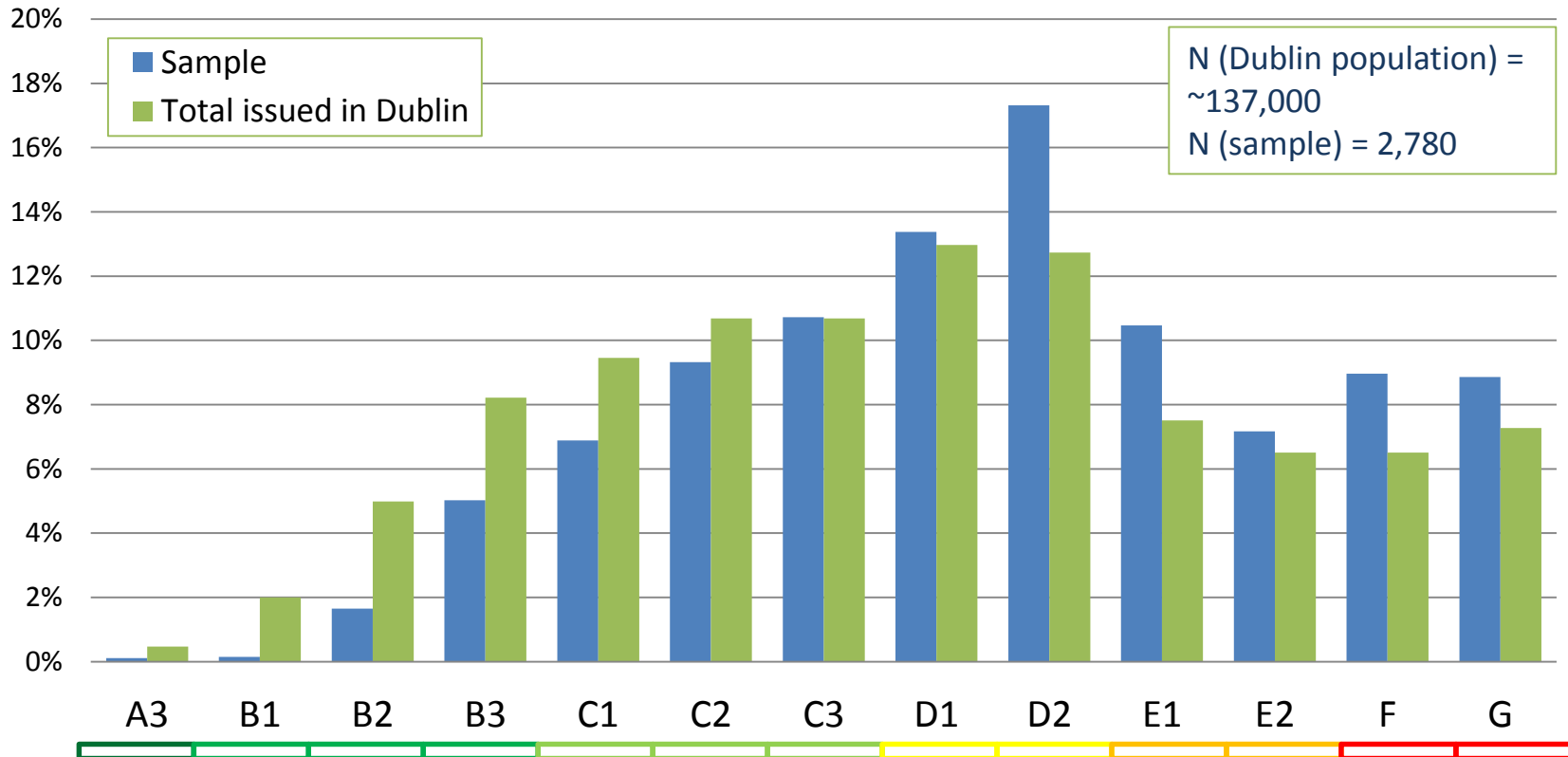
FIND A BER OR DEC



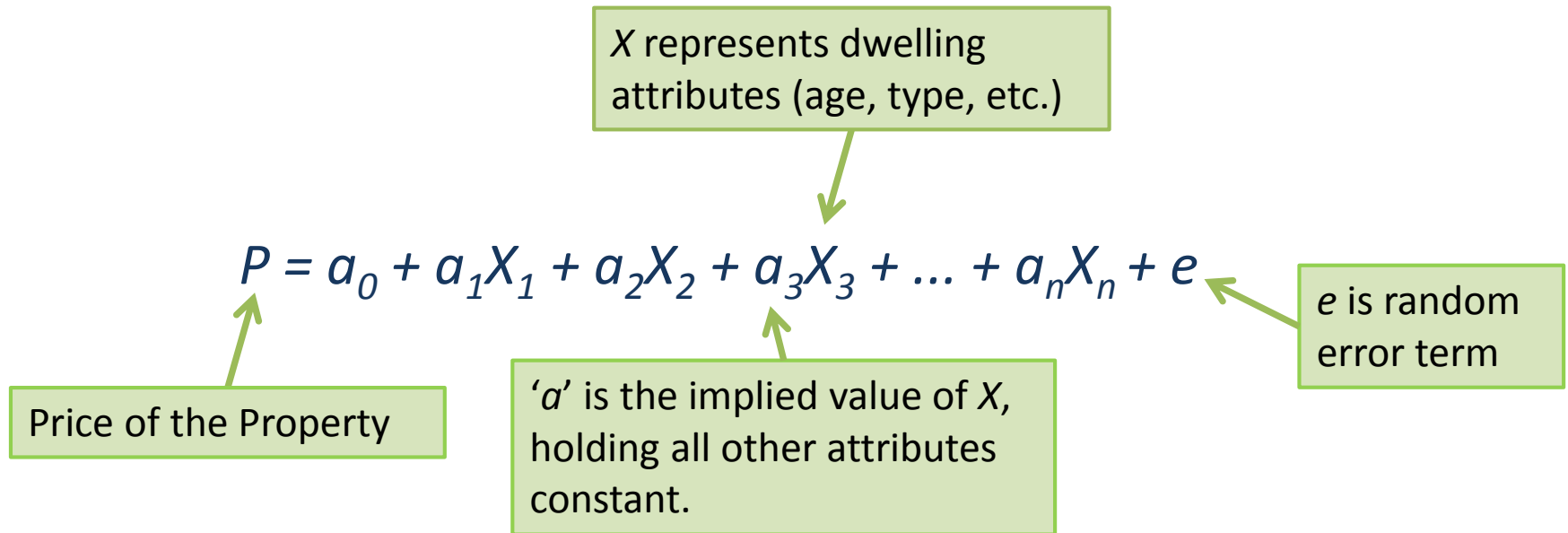
Check the validity of a BER or DEC certificate.

- ~475,500 Domestic BERs on Public Register (27% Irish households)
13% A, B rated; 62% C, D rated; 25% E or lower.
- Almost 1/3 of BERs issued for Dublin region.

Distribution of BERs in Dublin



- **Hedonic Regression:** revealed price of a property broken down into the value of its constituent parts (age, size, type, etc.) to estimate willingness to pay for individual attributes when a building's characteristic changes.



- As well as attributes (x 's), location (n) and energy efficiency (c) also included, such that price is a function of building characteristics, location, and energy rating:

$$P = f(x, n, c) + e$$



Hedonic Model Results



Energy rating variables (c)

Building attributes (x); house type, size, and age

Note, location (n) and time of advertisement controlled for in regression but excluded from results table

No. of observations (N = 2780) and goodness of fit (77% of variation in price explained by the model)

Dependent variable: Price	Model 1: Coefficient	Std. error	Model 2: Coefficient	Std. error	Model 3: Coefficient	Std. error
<i>Efficiency Indicators:</i>						
EPI	-0.0003***	0.000				
EPI (log)			-0.086***	0.002		
BER (continuous)					0.010***	0.003
<i>House type:</i>						
Apartment	-0.178***	0.046	-0.180***	0.046	-0.174***	0.045
Apt. (Top)	0.027	0.025	0.027	0.025	0.022	0.025
Apt. (Ground)	0.027	0.026	0.028	0.026	0.024	0.026
Detached	0.210***	0.054	0.209***	0.054	0.207***	0.053
Terrace	-0.185***	0.048	-0.185***	0.048	-0.182***	0.047
Semi-Detached	-0.125***	0.032	-0.126***	0.032	-0.125***	0.032
<i>Size:</i>						
Square Metres	0.805***	0.207	0.808***	0.208	0.817***	0.210
<i>Age of building:</i>						
Pre-1900	0.221***	0.057	0.210***	0.054	0.195***	0.050
1900s	0.203***	0.052	0.191***	0.049	0.176***	0.045
1910s	0.169***	0.043	0.160***	0.049	0.147***	0.048
1920s	0.231***	0.059	0.227***	0.058	0.220***	0.056
1930s	0.196***	0.050	0.192***	0.049	0.183***	0.047
1940s	0.148***	0.038	0.142***	0.037	0.134***	0.034
1950s	0.055	0.028	0.049*	0.028	0.039	0.028
1960s	-0.025	0.024	-0.027	0.024	-0.034	0.024
1970s	0.072***	0.019	0.073***	0.019	0.069***	0.018
1980s	0.097***	0.025	0.098***	0.025	0.097***	0.025
1990s	REF		REF		REF	
2000s	-0.043**	0.019	-0.051***	0.020	-0.047**	0.019
Constant	8.826		9.216		8.638	
R ²	0.773		0.772		0.772	
N	2780		2780		2780	

Significant at ***1%, **5%, *10% levels respectively.

- Energy efficiency has a significant, positive relationship with list price.
- **A 50-point improvement (decline) in the Energy Performance Indicator** is associated with a **1.5%** higher list price (consistent with EC (2013)).
- **10% improvement in EPI** is associated with **0.86%** increase in price.
- **One-point improvement in BER** yields a list price increase of **1%** (consistent with national figures (Hyland et al, 2013)).

E.g. Typical property advertised for sale in Dublin in 2013 -

D1 BER rating, ~€250,000 list price:

- **Price premium:**
 - 50-point improvement in EPI – €3,750
 - 10% improvement in EPI - €2,150
 - D1 to C3 BER - €2,500



Irish Home Energy Savings (HES) Scheme, SEAI Survey (n=210)

Average change in BER rating: **D2 to C3**

Ave. Investment Cost (e.g. wall/attic insulation, boiler controls): **€3,000**

Ave. Price Premium: **€5,000 (from present analysis)**

Ave. Annual Savings (SEAI ex-post analysis): **-21% gas bill; ~€200, 2010**

Ave. Annual Savings (DEAP engineering model): **~€300, 2010**

- SEAI HES survey 2010 - 14% believed no effect on price, 56% believed small effect, 20% didn't know.
- Empirically, evidence of willingness to pay for efficiency when buying a home.
- Cost of investment may be offset if the value of efficiency is considered and captured in the selling price.

Future Research

- Heckman rather than OLS to ensure no selection bias
- Extend analysis to all Ireland & extract BER categorical estimate
- Further comparisons of price premiums, investment costs and savings estimates

Thank you

I would be happy to answer any
Questions or Comments

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