

# The Impact of Employment on House Prices: Detailed Evidence from FDI in Ireland

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# Research question

How does employment affect house prices?

**Intel confirm Irish job losses**

BUSINESS 28 APR 2016

**Shire to bring 400 jobs to Meath  
in \$400m biotech investment**

*Apple gets green light to add 1,000  
jobs at Irish headquarters*

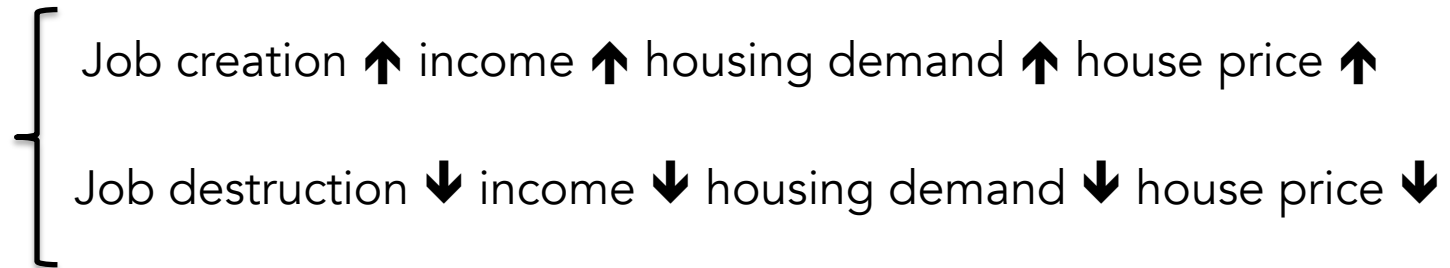
*Pennys has announced plans to create more than 300 jobs in  
Dublin.*

# Introduction

- Using employment at foreign-owned firms.
  - The employment survey (DJEI) tracks employment levels in manufacturing & internationally-traded services. Irish owned firms under-represented.
- Employment is measured by lagged employment changes at the nearest firm (based on size).
- Finding: 1000 new jobs at the nearest medium or large firm increases house prices by 1.4-6.3%.

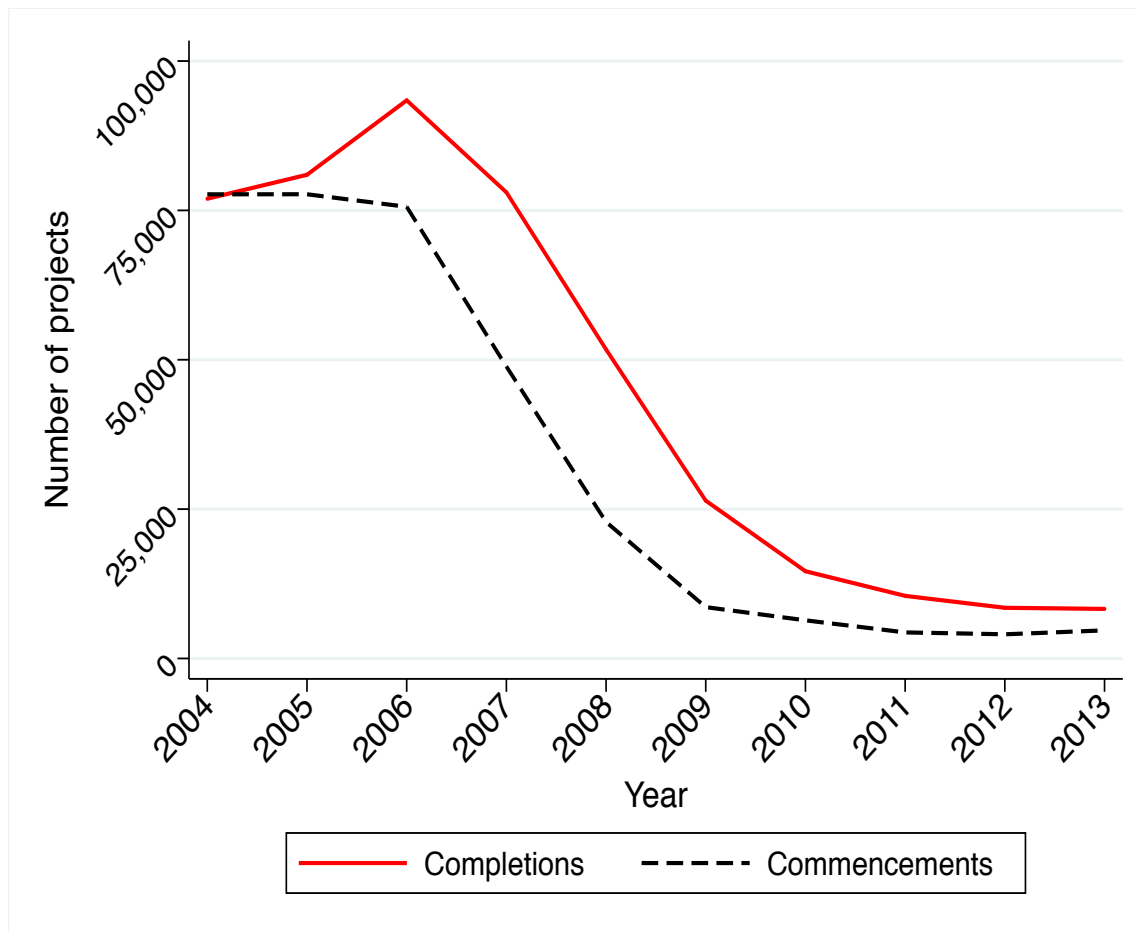
# How will employment affect house prices?

- Given an inelastic housing supply



- The employment effect is greater the closer the property is to the employment (e.g. Osland et al., 2007).
- House prices may react to expectations about future employment in the area (Carlton, 1983; Rosenthal and Strange, 2003).

Figure 1.  
Residential housing supply in Ireland, 2004-13



Source: *Housing Statistics*, Department of Housing, Planning, Community and Local Government.  
Available at: <http://www.housing.gov.ie/housing/statistics/housing-statistics>.

# Contribution

Why is this paper unique?

- The first detailed analysis of the economic effect of employment. Uses a purpose built dataset that is spatially granular in housing, employment & location.

What are the policy implications?

- Employment boosts the local economy
- Wealth effect associated with employment

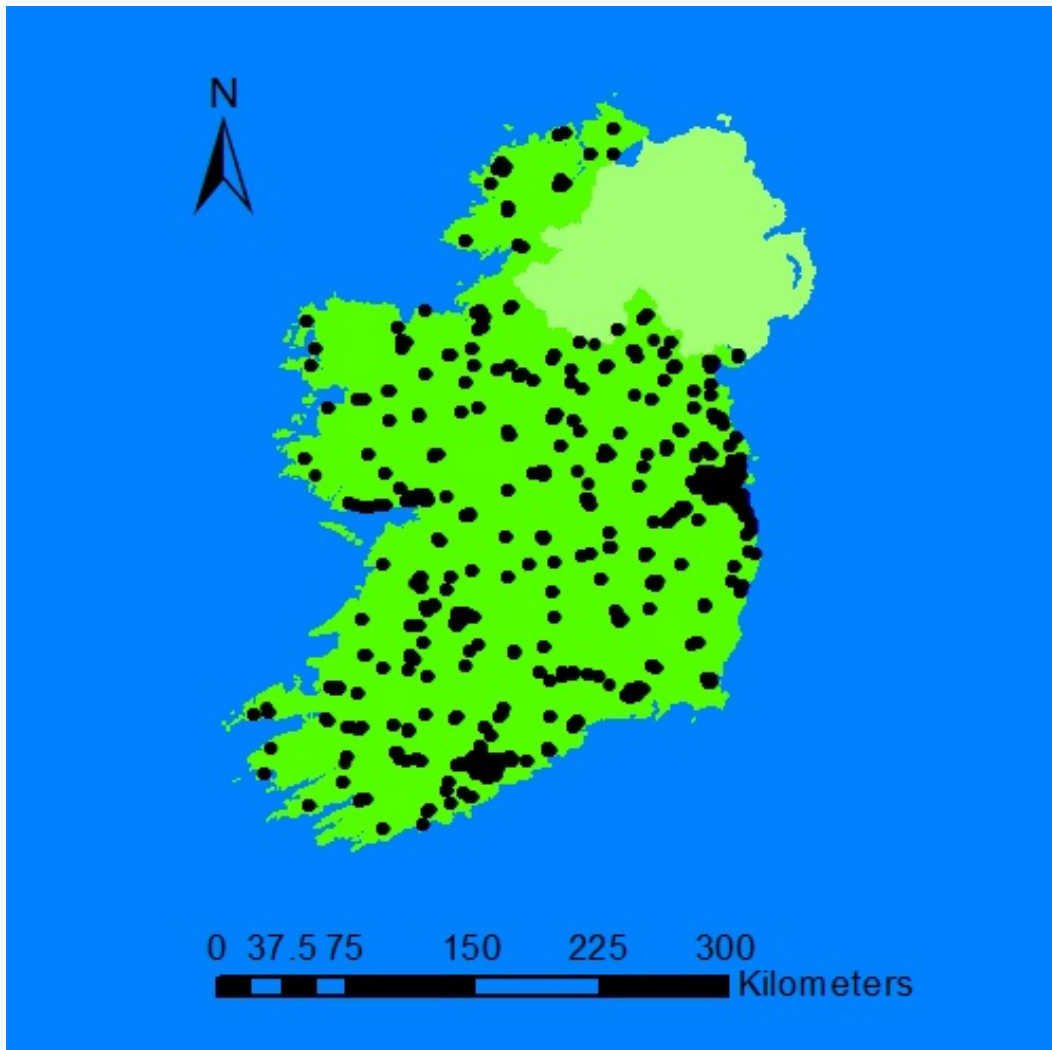
# Data

<b>1. Housing market</b>	<p>Daft.ie</p> <ul style="list-style-type: none"><li>• 1,090,790 rent listings</li><li>• 324,619 sale listings</li><li>• 2007-13 (Jan-Dec)</li><li>• xy coordinate of property</li><li>• listing price</li><li>• structural characteristics</li></ul>
<b>2. Location</b>	<p>Census, xy coordinates, CSO Crime survey</p> <ul style="list-style-type: none"><li>• education, transport, environment, crime, unemployment etc.</li></ul>
<b>3. Employment</b>	<p>Dept. of Jobs, Enterprise and Innovation</p> <ul style="list-style-type: none"><li>• annual panel of agency-assisted firms</li><li>• 2004-13 (Nov-Oct)</li><li>• xy coordinate of firm</li><li>• number of employees</li><li>• ownership: foreign or Irish</li><li>• sector</li></ul>



Figure 2.

Location of foreign-owned firms (1770), 2004-13



# Econometric specification

Hedonic regression (pooled):

$$\ln \text{houseprice} = f(\text{employment}, \text{structure}, \text{location}) + \varepsilon$$

Inprice: sale price or monthly rent of a property, 2007-13

Employment: lagged changes in employment at the nearest firm

Structure: e.g. no. bedrooms, property type

Location: e.g. crime, Electoral Division (3409) & County dummies (26)

Other: Year-month dummies

# Employment at the nearest firm

- Employment changes at:
  1. Nearest firm of any size
  2. Nearest medium or large firm (MOL)
- Two ways to calculate employment changes:
  1. Allow the nearest firm to change each year (inc. firm start-ups and shutdowns)
  2. Track employment changes at the nearest firm in period  $t$
- We also include distance to the nearest firm (in period  $t$ )

# Theoretical predictions

- We expect changes in employment ( $\Delta\text{emp}_{t-n}$ ) to be  $> 0$

i.e. job creation increases house prices

Note:  $\Delta\text{emp}$  is scaled to show the impact of *1000 jobs*

- We expect distance ( $\text{ldistance}$ ) to be  $< 0$

i.e. the lower the distance of the property to the firm, the higher the house price

**Table 1.**

## Employment and house prices, using changing nearest firms

Foreign owned firms

Independent variables	Log of monthly rent		Log of sale price	
	(1) Nearest	(2) Nearest MOL	(3) Nearest	(4) Nearest MOL
$\Delta emp_t$	.0051** (.0023)	.0009 (.0019)	.0218** (.0098)	.0096 (.0067)
$\Delta emp_{t-1}$	.0103*** (.0027)	.0051*** (.0018)	.0193* (.0103)	.0301*** (.0071)
$\Delta emp_{t-2}$	.0047* (.0027)	.0084*** (.0019)	.0448*** (.0084)	.0206*** (.0061)
$ldist_t$	-2.95e-06*** (2.41e-07)	-.0076*** (.0005)	-7.86e-07 (5.05e-07)	-.0029* (.0016)
Physical controls	YES	YES	YES	YES
Location controls	YES	YES	YES	YES
ED dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
County dummies	YES	YES	YES	YES
R-squared	0.76	0.76	0.69	0.69
N	1,090,172	1,090,172	324, 619	324, 619

Notes: \*\*\*p<0.01 \*\*p<0.05 \*p<0.1. Robust standard errors are in parentheses. Numbers are rounded to four decimal places where possible.

**Table 2.**

## Employment and house prices, using the same nearest firm

Foreign owned firms

Independent variables	Log of monthly rent		Log of sale price	
	(1) Nearest	(2) Nearest MOL	(3) Nearest	(4) Nearest MOL
$\Delta emp_t$	.004 (.0039)	.0119*** (.0023)	-.0226* (.0118)	.0034 (.0097)
$\Delta emp_{t-1}$	.032*** (.0043)	.0182*** (.0023)	.0061 (.0135)	.0049 (.0107)
$\Delta emp_{t-2}$	.0182*** (.004)	.0326*** (.0027)	.0366** (.0149)	.0181* (.0108)
$ldist_t$	-2.73e-06*** (2.51e-07)	-.0073*** (.0005)	-4.23e-07 (5.09e-07)	-.003** (.0016)
Physical controls	YES	YES	YES	YES
Location controls	YES	YES	YES	YES
ED dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
County dummies	YES	YES	YES	YES
R-squared	0.76	0.76	0.70	0.70
N	982,396	1,052,967	302,238	313,750

Notes: \*\*\*p<0.01 \*\*p<0.05 \*p<0.1. Robust standard errors are in parentheses. Numbers are rounded to four decimal places where possible.

# Other findings

1. Heterogeneous effects across time, sector & geographic area. Employment effect greater:
  - For job destruction, relative to job creation
  - Post financial crisis (2010-13)
  - For MOL information & communication firms (20.48% on rents)
  - In the West for rents, and SW for sale price
2. Computed  $\Delta\text{emp}$  for the nearest 5 firms and in the ED
3. Evidence of employment potential affecting house prices
4. Different employment effects at domestically owned firms (in the survey)

# Summary

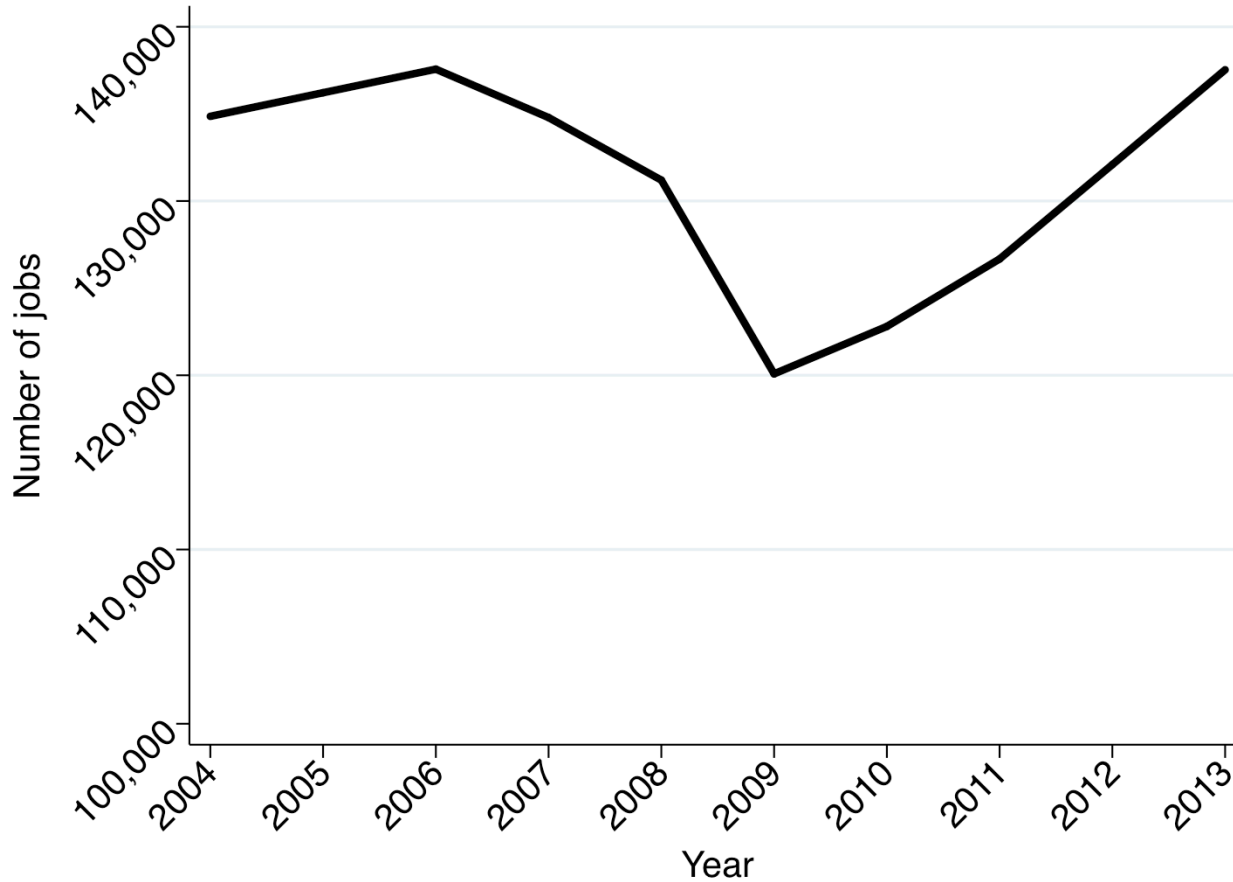
- Presented evidence that employment affects nearby house prices, using data for foreign owned firms.
- Employment changes at the nearest medium or large firm increases rents by 1.4-6.3%.
- Employment is capitalized into house prices through a lagged adjustment process.
- Rents are affected by employment more than sale prices are.
- We find heterogeneous effects across a range of dimensions inc. sector, geographic area and overtime.



# Appendices

**Figure 3.**

Total number of jobs in foreign owned firms, 2004-13



# Variable list (exc. employment)

House price		Structure	Location
<ul style="list-style-type: none"> <li>• Sale price</li> <li>• Monthly rent</li> </ul>	Both	<ul style="list-style-type: none"> <li>• Bedrooms</li> <li>• Bathrooms</li> <li>• Property type</li> <li>• Garden</li> </ul>	<ul style="list-style-type: none"> <li>• Distance to:               <ul style="list-style-type: none"> <li>• Rail station</li> <li>• Road network</li> <li>• Airport</li> <li>• Education</li> <li>• Coast, river &amp; lake</li> <li>• Central Business District</li> <li>• Prison</li> <li>• Supermarket</li> <li>• Convenience store</li> <li>• Stadium</li> <li>• Monument</li> </ul> </li> <li>• Number of crimes (Garda stations)</li> <li>• Census 2011 by small area:               <ul style="list-style-type: none"> <li>• Unemployment rate</li> <li>• Population density</li> <li>• Fraction foreign born</li> <li>• Fraction vacant properties</li> <li>• Fraction with post-secondary education</li> </ul> </li> </ul>
	Rent	<ul style="list-style-type: none"> <li>• Furnished</li> <li>• Parking</li> <li>• Central heating</li> <li>• Wheelchair access</li> <li>• Agent</li> <li>• Dryer</li> <li>• Dishwasher</li> <li>• Microwave</li> <li>• Pets</li> <li>• Cable television</li> <li>• Washing machine</li> </ul>	
	Sale	<ul style="list-style-type: none"> <li>• House type</li> <li>• New development</li> <li>• House alarm</li> </ul>	

**Table 2.**

Foreign owned firms by sector, 2004-13

<b>Sector</b>	<b>Percentage</b>
Accommodation and food services	0.06
Administrative and support service	0.68
Arts, entertainment and recreation	0.28
Agriculture, forestry and fishing	0.4
Education	0.06
Financial and insurance	18.25
Information and communication	33.22
Manufacturing	44.58
Professional, scientific and technical	1.24
Transportation and storage	0.56
Water supply, sewage and waste management	0.06
Wholesale and retail trade	0.62
Total	100

Note: Sectors are classified using NACE Rev.2