A Rent Forecasting Model for the Private Rented Sector in Ireland

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Introduction

There is a growing recognition that the private rented sector (PRS) has an important role to play in meeting Ireland's housing needs. However, even some very basic information about the rented tenure is unavailable on a timely basis. For instance, there are no regular updates on the number of people living in this type of accommodation nor are there timely data on the number of properties that comprise the PRS.

These information deficits affect various stakeholders. Firstly they make the job of housing policy formation more difficult. Legislators need real-time information to understand how tenure shift is impacting on the policy challenges that they face. But equally they need to monitor how their own policy decisions are influencing tenure choice. In addition, the lack of timely data creates problems for analysts. Without information on the size of the rental stock, for example, a vacancy rate cannot be calculated. This makes it much harder to model and forecast market rents in the PRS. Finally, the empirical deficit means that investors, developers and funding institutions have to make business decisions based on incomplete information.

This document aims to redress some of the glaring empirical deficits that currently exist in relation to the Irish PRS. It then demonstrates the benefit of having better data by developing a simple rent forecasting model for the sector. The first part of the paper develops previously untapped statistical sources, and integrates them with existing datasets, to provide quarterly information on;

- The number of persons in the PRS
- The number of households in the PRS
- The total stock of properties in the PRS
- Vacancy rates in the PRS

The second part of the paper uses the derived vacancy rate data to econometrically model and forecast rental growth in the Irish PRS.

1. What size is Ireland's Private Rented Sector?

The main source of historical information on housing tenure in Ireland is the Census of Population. Census records show that the proportion of Irish households living in private rented accommodation declined steadily between 1946-1991 but then rebounded strongly over the following 20 years (see Graph 1).[1]

GRAPH 1
Proportion of households in the PRS

Source: CSO
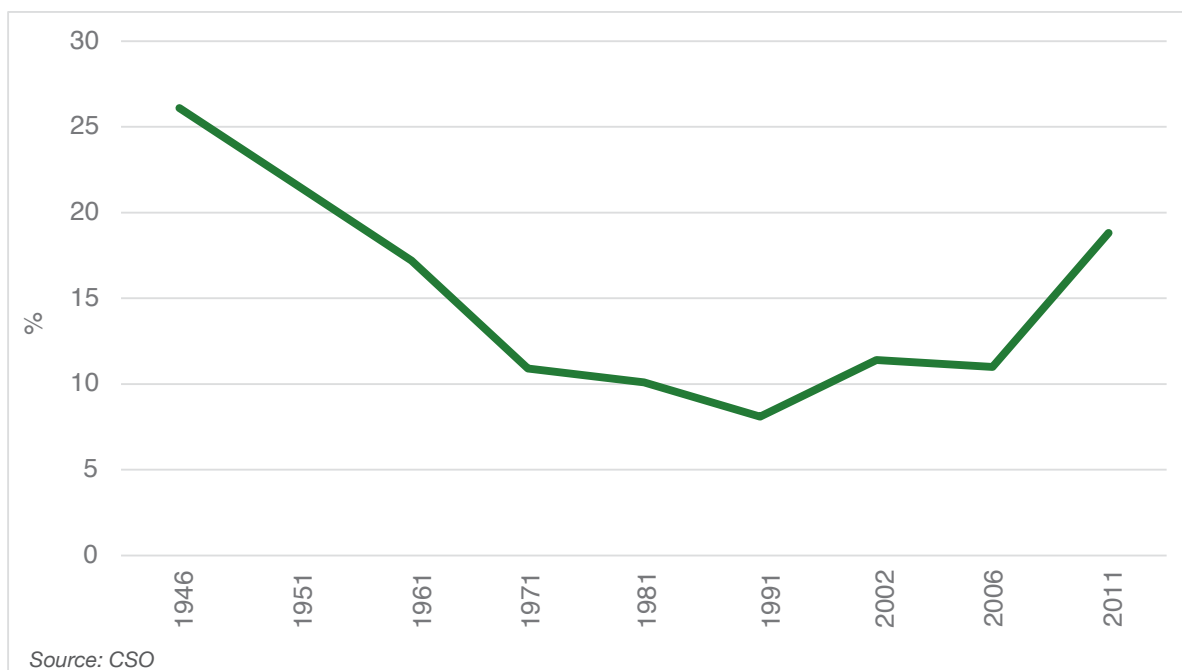
[1] For a detailed discussion on the spatial, social, economic and policy factors that drove this rise-and-fall see NESC (2014), Norris (2014).

Unfortunately, because of the deficits outlined above, no data are available on how the PRS has evolved since the April 2011 Census. This has led to a pronounced difference of opinion over whether the number of properties in Ireland's PRS is rising or falling.

Some analysts, including those at Savills, have said that the number of properties in the PRS is increasing due to both demand and supply-side factors. On the demand side rising house prices, sluggish earnings growth, weakened household balance sheets and tight mortgage lending have channelled would-be owner-occupiers into the rental market. Furthermore, low rates of social housing construction, in conjunction with the growth of State supports like Rent Allowance and the Housing Assistance Payment (HAP), have also diverted social renters into the PRS. On the supply side, Savills and others have argued that a large and widening gap between residential yields and returns on other assets such as deposits and bonds has led to a net inflow of investors into the PRS.

In contrast others, including some business associations and estate agents, say that investors are fleeing the market. For example estate agent Sherry FitzGerald claims that the stock of rental properties contracted by 40,000 units - or 13% - across Ireland between 2011 and 2015.[2] The reasoning behind this proposition is that the high costs of owning a rental property have forced landlords out of the market (presumably because increased operating costs have driven a bigger wedge between gross and net investment yields).

Both sides have endeavoured to support their positions with empirical evidence but the data that they have invoked are less than compelling. Estate agents have analysed the net flow of investor purchases within their own dealbooks to impute changes in the rented stock. However, these analyses have produced contradictory results - possibly because brokerages differ in their geographic coverage and the type of properties that they sell. Administrative data from the Residential Tenancies Board (RTB) have also been referenced, but improving compliance with registration requirements affects the trend, and the potential for landlords not to de-register after becoming inactive means that this information is not definitive.

2. New data on the scale of the PRS in Ireland

This paper aims to resolve these arguments utilising previously unpublished data from the CSO's Quarterly National Household Survey (QNHS).

The QNHS is based on a representative rolling sample of 26,000 households across Ireland. While this survey is primarily used to track the labour market, it also collects information on housing, including data on the nature of occupancy. Although not routinely published these nature of occupancy data were made available to Savills Research following a direct request to the CSO. The following data series were supplied;

• Number of persons by housing tenure
• Average number of persons per household by tenure
• Number of households by tenure

Quarterly data covering the period Q3 2000 to Q2 2016 were provided, disaggregated into the Dublin and Ex. Dublin regional levels. The results are presented below.
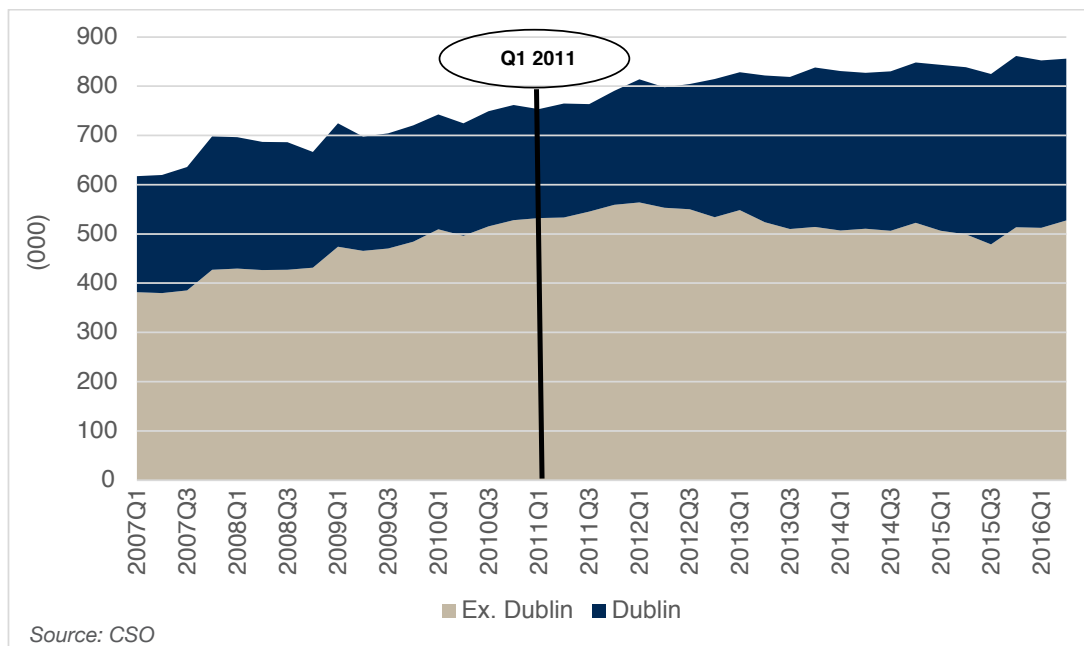
2.1. Number of persons in the PRS

• At a national level the number of people living in privately rented housing has risen by 102,500 (13.6%) since Q1 2011
• 856,100 people are now living in the PRS – 18.3% of Ireland's total population
• In Dublin, the number of people renting privately has risen by 107,500 since Q1 2011 – a 48.6% increase
• 328,700 people are currently renting privately in Dublin – 24.8% of the population in this location
• Outside Dublin, the number of people living in the PRS has edged down by 0.9% since Q1 2011
• 15.7% of the population outside Dublin now lives in privately rented accommodation

[2] Sherry FitzGerald (2015) Irish Residential Market Review 2015, Outlook 2016.
http://www.sherryfitz.ie/files/p_20160120015744SF%20Resi%20Report%20Q4%202015%20high%20res%20final.pdf

GRAPH 2

No. of persons in the Private Rented Sector

Source: CSO

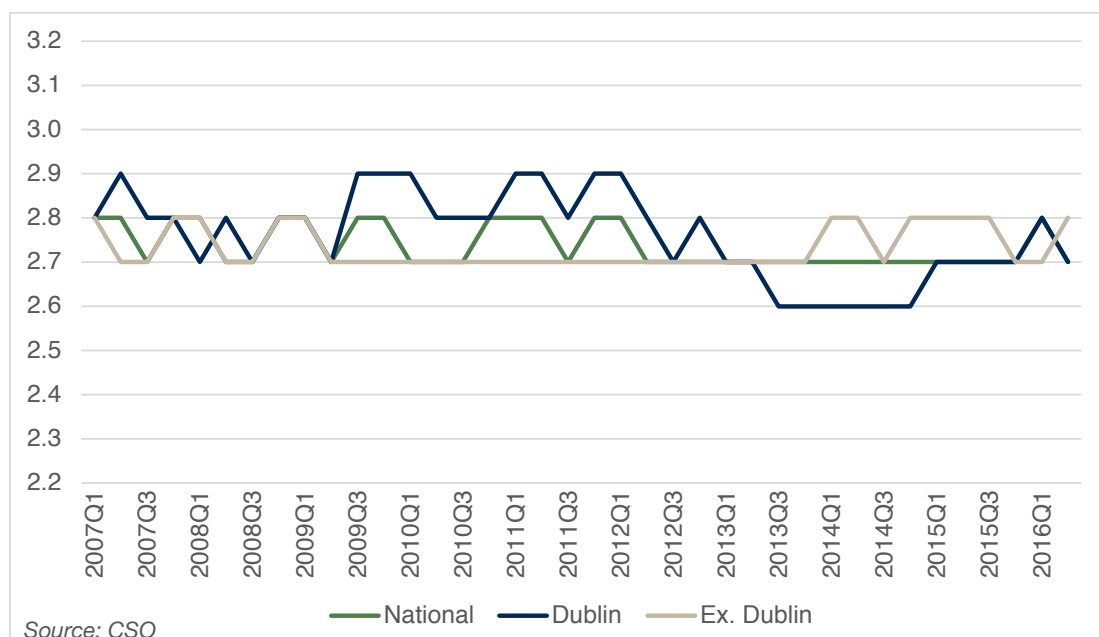## 2.2. Average number of persons per household in the PRS

In addition to supplying data on the number of persons renting privately, CSO also provided information on the average number of persons per privately rented household.

The graph below shows that there has been no increase in the average number of persons per privately rented

household - either in Dublin or outside Dublin - over the last decade. Therefore the increased number of people renting privately has not been achieved by squeezing tenants into larger rented households.

GRAPH 3

## Average number of persons per household in the PRS

Source: CSO

2.3. Number of households in the PRS

The CSO dataset also provides information on the number of households (as distinct from persons) in the PRS. With the number of persons having increased, and with the average number of persons per household having remained more-or-less constant, it is unsurprising that the number of households renting privately has risen. Graph 4 shows that;

• Nationally, the number of households renting privately has risen by 40,400 since Q1 2011 – a 14.9% increase

• In Dublin the number of households in the PRS has risen by 46,300 – a 61.3% increase

• Currently 24.5% of all households in Dublin live in privately rented accommodation. By way of comparison, the corresponding figure for London is 27%[3]

• Outside Dublin the number of households in privately rented housing has edged down by 5,900 – a 3% decline

• Currently 15.5% of all Ex. Dublin households are in the PRS. The corresponding figure for England Ex. London is 18%

GRAPH 4

No. of households in the Private Rented Sector

Source: CSO
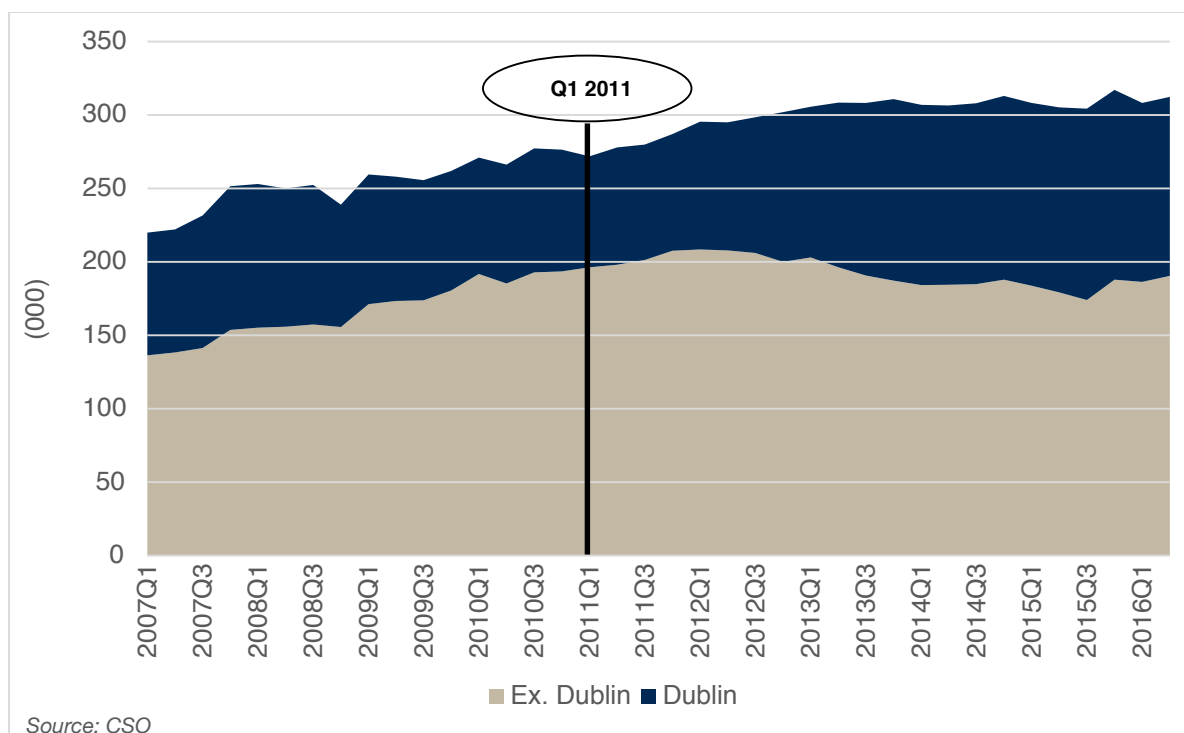
[3] See English Housing Survey Headline Report 2014-2015
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501065/EHS_Headline_report_2014-15.pdf

2.4. Number of properties in the Private Rented Sector

As it collects information on households rather than properties, the QNHS does not directly measure the number of housing units that comprise the PRS. However, if we make the assumption of one household per dwelling, it does provide an estimate of the number of occupied properties in the private rented tenure.[4] To get from this to the total stock of properties in the PRS we must also include vacant units. Property portal Daft.ie publishes figures on the number of vacant (i.e. unlet) units listed as available to rent on its website. Daft estimates that around 95% of all properties sold in Ireland are listed on its site. If we conservatively assume it has 90% coverage of the rental market then the listed vacancy figures can be grossed up to an overall market total using the following equation.[5]

Estimated No. Vacant Rental Properties = (No. of Available Properties Listed on Daft.ie / 90) x 100

On this basis, the estimated number of vacant rental units increased sharply during the recession and peaked at almost 29,000 in Q2 2009. Since then, however, the number has fallen sharply and now stands at just under 4,600. Adding these vacant rental units to the occupied ones (as derived from the QNHS) provides an estimated total number of properties in the PRS (see Graph 5).

- Nationally the stock of properties in the PRS has risen by over 24,000 units since Q1 2011 – a net increase of 8.2%
- In Dublin, a net additional 43,120 units have been added to the private rented stock since Q1 2011. This represents a 54% increase
- Outside Dublin, the stock of units in the PRS has fallen by 8.9% since Q1 2011

GRAPH 5

Estimated No. properties in the Private Rented Sector

Source: Savills research based on CSO, Daft.ie
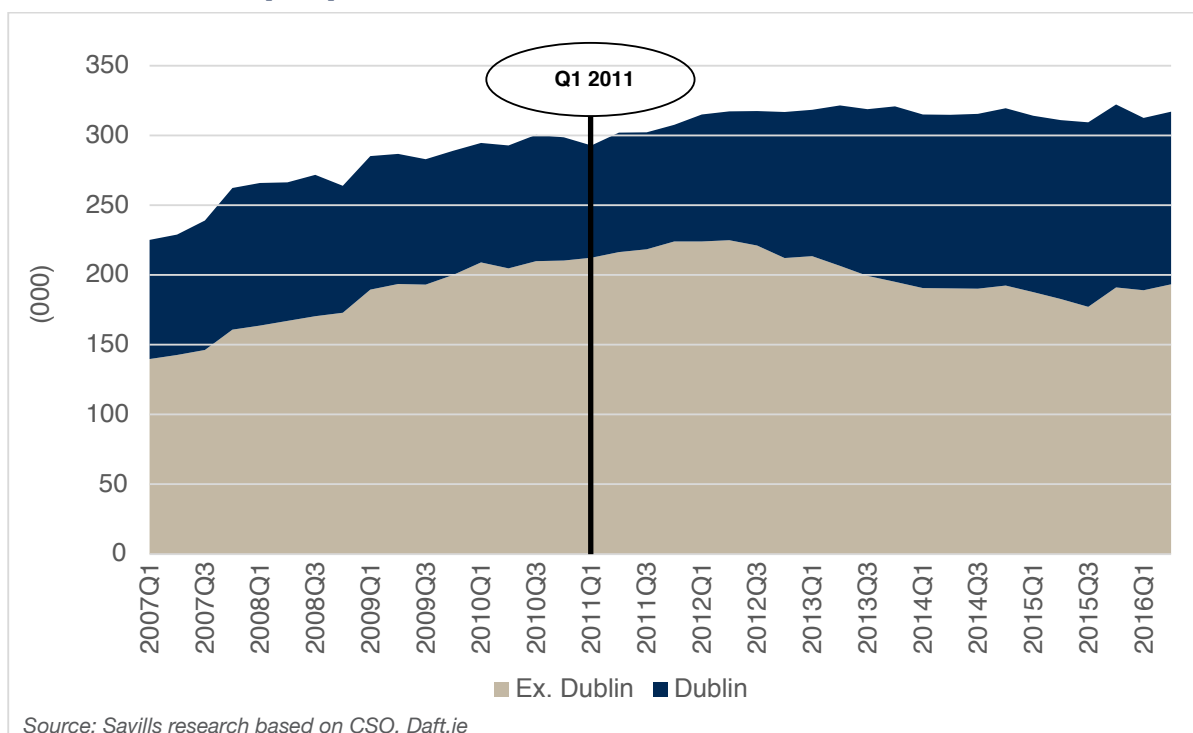
[4] This is a realistic assumption as unrelated people living together (i.e. a typical house-share arrangement) are treated as a single household if they are sharing the bills.

[5] The remainder of this paper reflects the assumption that Daft.ie has 90% rental market coverage. Sensitivity testing shows that the results are not materially altered by alternative assumptions within a plausible range. To illustrate this, Appendix A.1 presents outcomes assuming both 85% and 95% coverage.

3. Vacancy rates in the Private Rented Sector

With estimates of the vacant and total stock now available, a vacancy rate for the PRS can be calculated using the following formula;

Vacancy Rate (%) = No. Vacant PRS Properties / (Total No. PRS Properties / 100)

The derived series shows that, from a starting point of very low vacancy during the boom, vacancy rates in the PRS increased dramatically as the recession took hold, peaking at over 10% in Q2 2009. Not surprisingly, vacancy rates outside Dublin increased more sharply than those in the capital during this period.

From mid-2009 vacancy rates began to recede, but faster net absorption caused this to happen more quickly in Dublin. By Q1 2014 the surplus of vacant rental properties in Dublin had effectively run out and the vacancy rate has remained below 2% since this time. Currently the vacancy rate in the Dublin PRS is just 1.45%.

Vacancy rates reached a higher peak outside Dublin during the crash and have taken longer to come down. However, as the availability of accommodation became very tight in Dublin, demand was displaced to other locations and vacancy rates outside the capital had converged with those in Dublin by mid-2015. Today the availability of residential property to rent is also below 1.5% outside of Dublin (see Graph 6).

GRAPH 6
Vacancy rate, Private Rented Sector
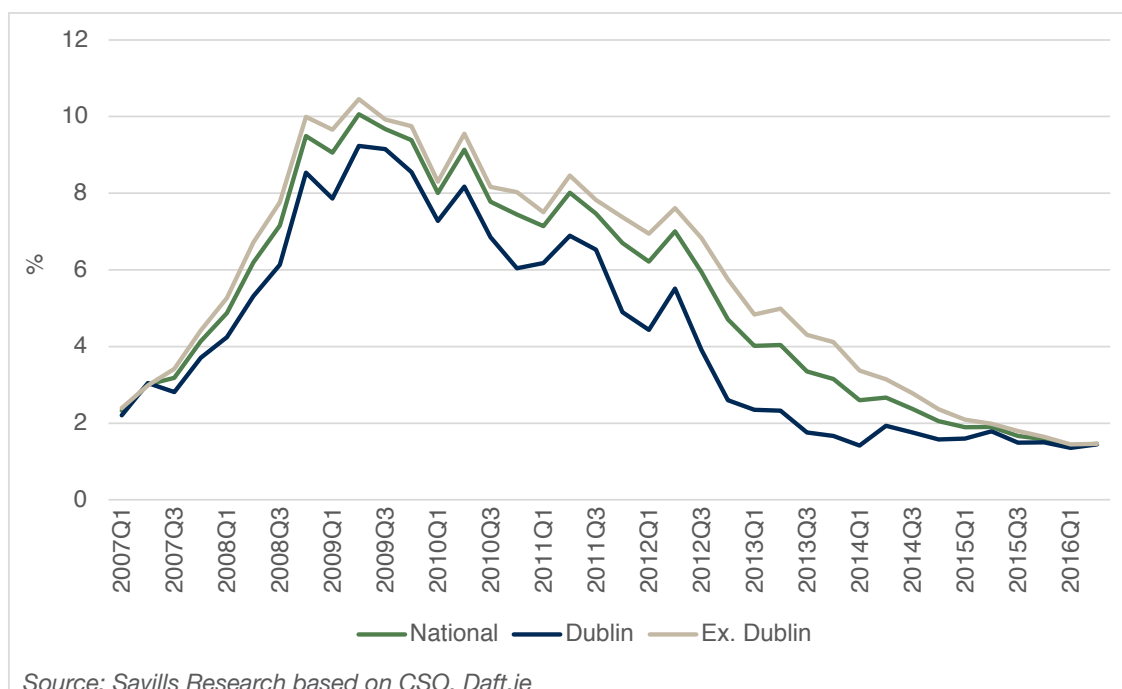
Source: Savills Research based on CSO, Daft.ie

Overall, Graph 6 confirms exactly what we would expect – the Dublin market is more resilient to voids in the face of a downturn than markets in regional locations. Despite this, however, yields have been as high if not higher in Dublin than elsewhere in recent years. It is this mismatch between the risk profile and the yield profile of residential property that has particularly attracted investment into the Dublin PRS.[6]

[6] See Daft.ie for latest data on gross residential yields http://www.daft.ie/report/q2-2016-daft-report-rental.pdf

4. The Natural Vacancy Rate

An inverse relationship is expected between vacancy rates and rental growth - when vacancy rates are low tenants bid up rents by competing for scarce accommodation. In contrast, when there is a surplus of vacant rental property, tenants drive down rents by negotiating discounts.

While this relationship broadly holds true, a real-world complication is that an identical vacancy rate can be consistent with rising rents in one market but falling rents in another. This is because rental growth is dictated not by the vacancy rate *per se*, but rather by the vacancy rate relative to what is natural for that market. This 'Natural Vacancy Rate' (NVR) varies between markets and depends on multiple factors including standard lease terms, rates of new housing development, market segmentation etc..[7]

For practical purposes, however, a key point is that the NVR represents the tipping point between positive and negative rental growth;

- Actual vacancy rate < NVR:
  Market undersupplied - rents will be rising
- Actual vacancy rate > NVR:
  Market oversupplied - rents will be falling
- Actual vacancy rate = NVR:
  Market in equilibrium - rents will be static

If time-series data on the actual vacancy rate are available then a market's NVR can be mathematically calculated.[8] Using the vacancy rate series described above, Savills has done these calculations for the Irish PRS at the national and regional levels. The resulting NVRs are set out in Table 1;

## Natural vacancy rate estimates for privately rented housing in Ireland

Region	Calculated NVR (%)
National	5.77
Dublin	5.70
Ex. Dublin	5.78

A rough cross-check on these calculations can be done graphically. By definition the market is in equilibrium when rental growth is zero (i.e. where the rental growth curve cuts the horizontal axis in a graph). In theory, the NVR should equal the actual vacancy rate at that moment in time. Graph 7 shows that rental growth last passed through zero between Q2 and Q3 2012. At that point the actual vacancy rate in the Irish PRS was 5.94% - very close to the econometrically estimated NVR of 5.77%.

Graphical verification of the natural vacancy rate

VR(%) Q3 '12 = 5.94%

Source: Savills Research based on CSO, Daft.ie
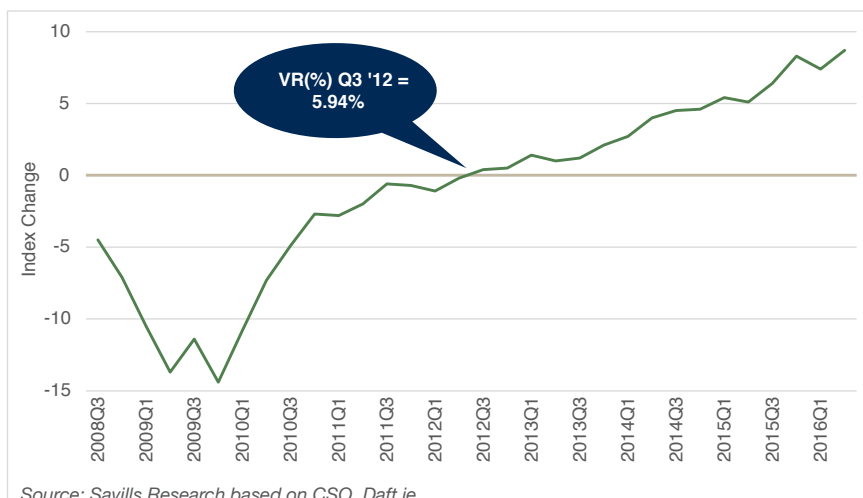
The practical implication of this analysis is that private rents are likely to keep rising in all locations until increased supply and/or reduced occupational demand returns the vacancy rate to around 5.75%. This means that the vacant stock would need to increase from its present level of 4,626 units to 18,267 units – a rise of almost 300% - before rental growth would cease. In Dublin, the vacant stock would need to rise by over 5,250 units before the market is restored to equilibrium.

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[7] For a detailed discussion of the theory of the NVR see McCartney (2011) and references therein.
http://www.tara.tcd.ie/bitstream/handle/2262/62343/mccartney%20pdf.pdf?sequence=1&isAllowed=y
[8] For a straightforward explanation of this methodology see Sanderson, Farrelly and Thoday (2008).

5. Modelling and forecasting rental growth

5.1. Modelling approach

As a summary measure of the balance between market supply and demand, the vacancy rate is a potentially powerful leading indicator of rental growth. Indeed vacancy rates have been widely used in the econometric modelling of both commercial and residential rents since the 1970s. The traditional 'rent adjustment' framework models rental growth as a function of the 'vacancy gap' i.e. the difference between the actual and natural vacancy rates. This classic approach is applied in the current analysis.[9]

A computer-aided procedure called regression analysis was used to discover the statistical relationship between movements in the vacancy gap and real rental growth rates over a 31 quarter period between Q3 2008 – Q2 2016.[10] The resulting model explains;

- 94.6% of movements in the national real rents index during this time
- 95.2% of movements in the Dublin real rents index
- 93.8% of movements in the Ex. Dublin real rents index

The explanatory power of the model in each of the regions is shown graphically below. In each case the beige line shows the rental growth that actually occurred while the navy line shows the rental growth that was predicted by the model.

GRAPH 8 (a)
Actual Vs predicted rental growth (National)

Source: Savills Research

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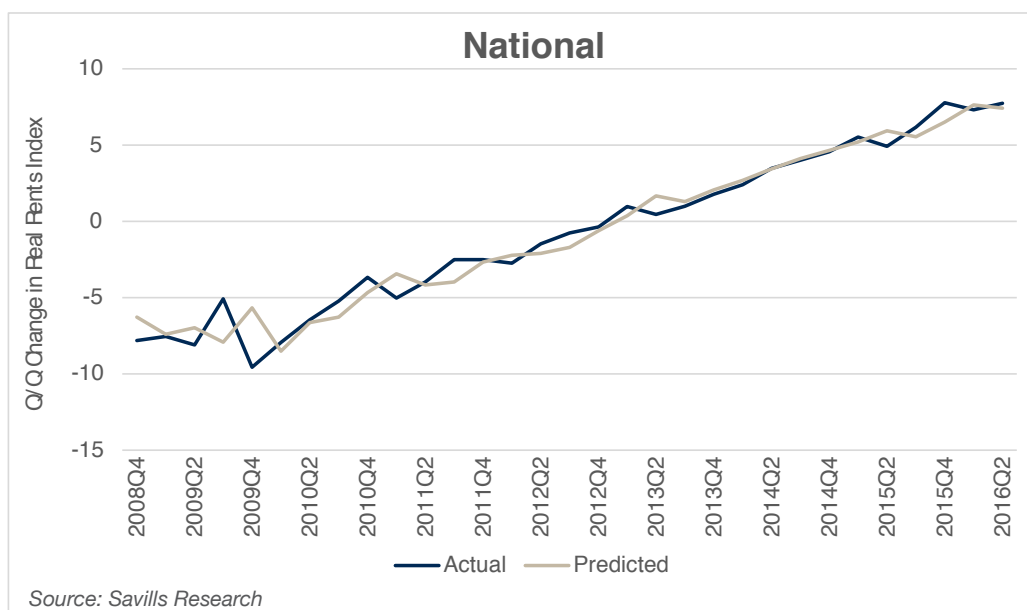
[9] The rent adjustment methodology has been refined over time but a basic specification, as utilised by Sanderson, Farrelly and Thoday (2008), performed very well in this application and was preferred due to our relatively limited data.

[10] The model was estimated using Ordinary Least Squares (OLS) regression. The rents series was deflated to real terms using CPI. Routine diagnostic checks were run to test for violations of statistical assumptions. One lag of the dependent variable was included to counter serial correlation.

Actual Vs predicted rental growth, Dublin 8 (b) and Ex. Dublin 8 (c)

Source: Savills Research

Source: Savills Research
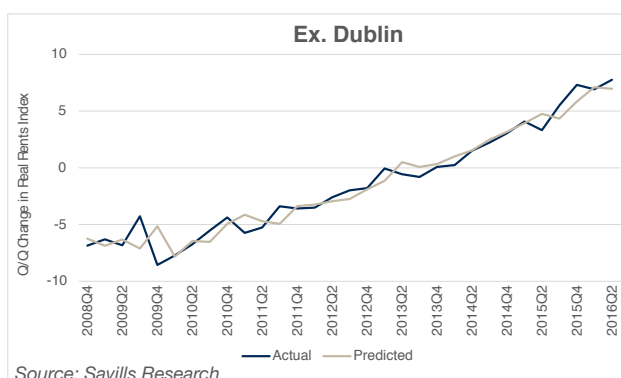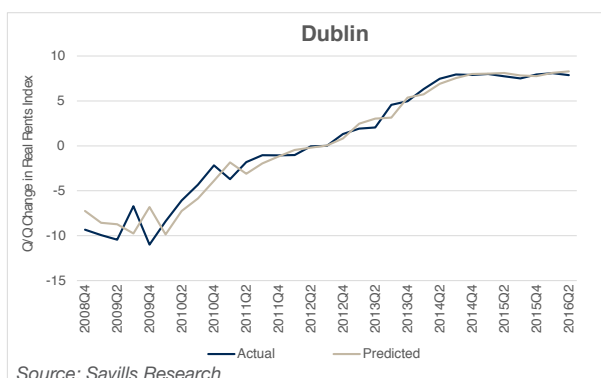
5.2. Forecasting adequacy tests

Our model identifies a strong mathematical relationship between vacancy rates and growth in residential rents over the last decade. If this relationship holds into the future then we should have a useful tool for forecasting rental growth.

However, a paradox of statistical analysis is that models which are effective in explaining past trends are not necessarily good at predicting future trends. Therefore before forecasts are generated it is good practice to test a model's predictive adequacy. This is done by 'withhold sampling'. The model was run over a shortened period up to Q4 2013. The resulting equation was then used to forecast rental growth for the period Q1 2014 – Q2 2016 inclusive. These forecasts were tested against actual rental growth outcomes for this period. In this case our model proved to be effective in forecasting.

5.3. Sample forecasts

Having established the model's ability to predict rental growth within a specified margin of error, rental growth forecasts for the period Q3 2016 – Q4 2018 inclusive have been generated. These forecasts are conditional on the vacancy rate assumptions we feed into the model. To demonstrate the concept, it is assumed that residential vacancy rates in all locations will contract by 0.1pp per quarter between Q3 2016 and Q4 2017 inclusive. This technical assumption is in line with the average decline over the last four quarters. However, it is also a realistic expectation based on the likelihood that growth in demand (due, *inter alia*, to rapid population growth and tenure shift) will outstrip the growth in supply due to new housing completions over the next 18 months. From Q1 2018 it is assumed that new housing development will catch up with demand and begin to drive the vacancy rate back up at a similar rate.[11]

Based on these assumptions, forecast movements in real rents over the period Q3 2016 – Q4 2018 are as shown in Table 2;

TABLE 2

# Indicative rental growth forecasts Q3 2016 – Q4 2018 inclusive (%)

	National	Dublin	Ex. Dublin
Compound Growth	24.4	23.8	24.7
Average Change Q/Q	2.2	2.2	2.2
Average Change Y/Y	8.6	8.6	8.6

[11] As a sensitivity test Appendix A.2 presents forecasts based on two alternative vacancy rate scenarios.

It should be noted that all forecasts of this nature are subject to a margin of error so that, even if our input assumptions are correct, the forecasts are unlikely to be exactly right. However, a 'confidence interval' can be calculated around the forecast which is 95% certain to contain the actual outcome, conditional on the input assumptions being accurate. These confidence intervals show that, if vacancy rates evolve as assumed in this analysis, there is only a 2.5% probability that compound rental growth by end-2018 will be less than 13.7% (national), 19.2% (Dublin) and 13.8% (Ex. Dublin).

GRAPH 9 (a)
Forecast real rental growth (National)

Source: Savills Research
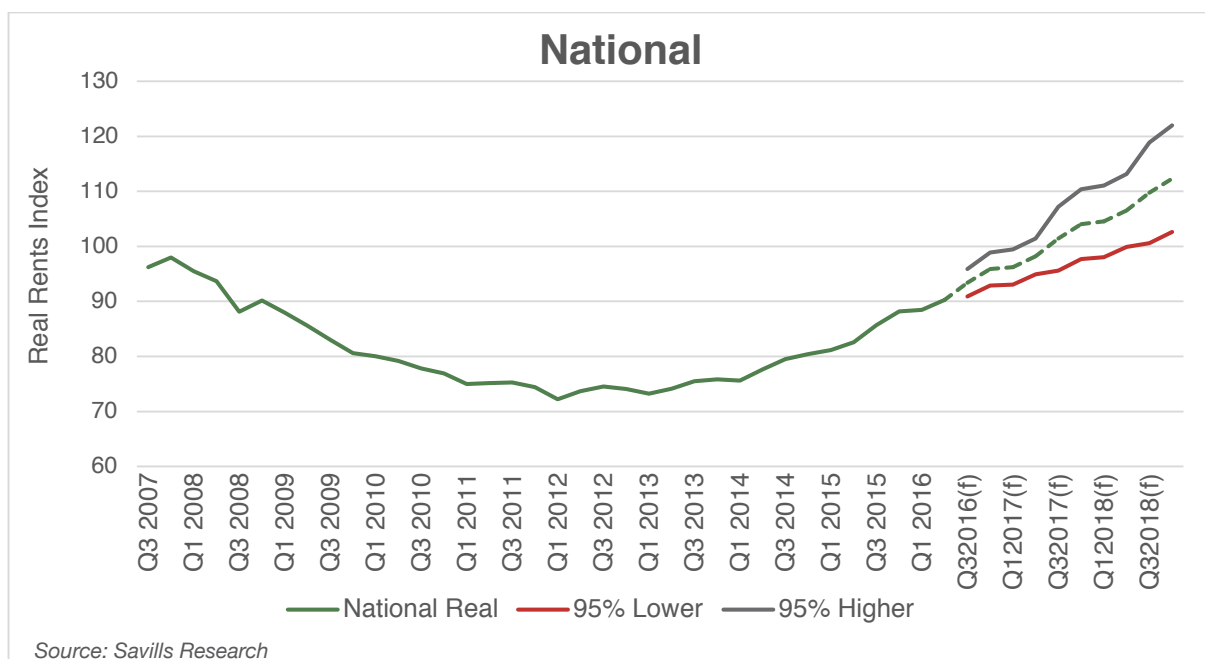
GRAPHS 9 (b) and 9 (c)
Forecast real rental growth Dublin 9 (b) and Ex. Dublin 9 (c)

Source: Savills Research

Source: Savills Research
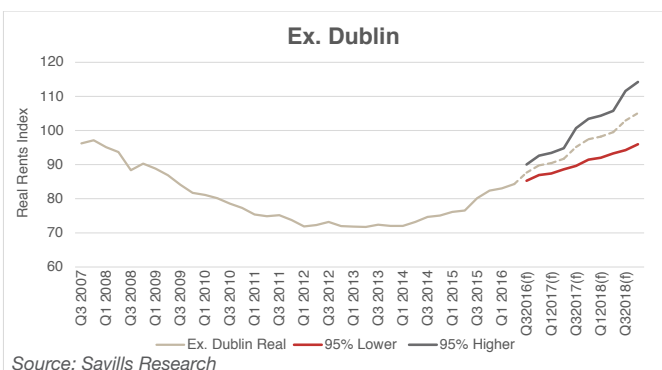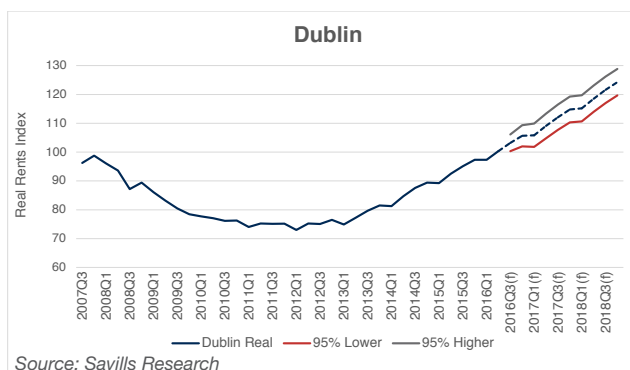
6. Conclusions

Based on the previously untapped data sources that have been developed and brought together in this paper, it is clear that the private rented sector in Ireland has continued to expand since 2011.

- The number of persons living in the PRS has risen by 13.6%
- The number of households in private rented accommodation has increased by 14.9%
- The number of properties in the PRS has risen by 8.2% net
- This growth has been concentrated in Dublin while, elsewhere, the sector has contracted marginally

Although this evidence contradicts claims that the number of rental properties in Ireland fell by 40,000 (13%) between 2011 and the end of 2015, it should not be surprising. On one hand population growth, combined with a tenure shift away from social renting and home-ownership, have led to an increased demand for privately rented accommodation. With sluggish construction activity starving the market of supply this has driven a sustained increase in rents which, in turn, has inflated gross yields at a time when returns on financial assets have been falling. Admittedly increased costs for landlords have widened the gap between gross and net yields.[12] However, given the underlying level of gross yields, there is still a large differential between the net returns that are available on residential property and the risk-free rate of return. The fact that this has, in net terms, attracted an inflow of investment into the PRS is absolutely in line with conventional economic theory.

GRAPH 10

Estimated residential property yields Vs deposits and bonds Q2 2016

Source: Daft.ie, CBI, Countryeconomy.com, Savills Research

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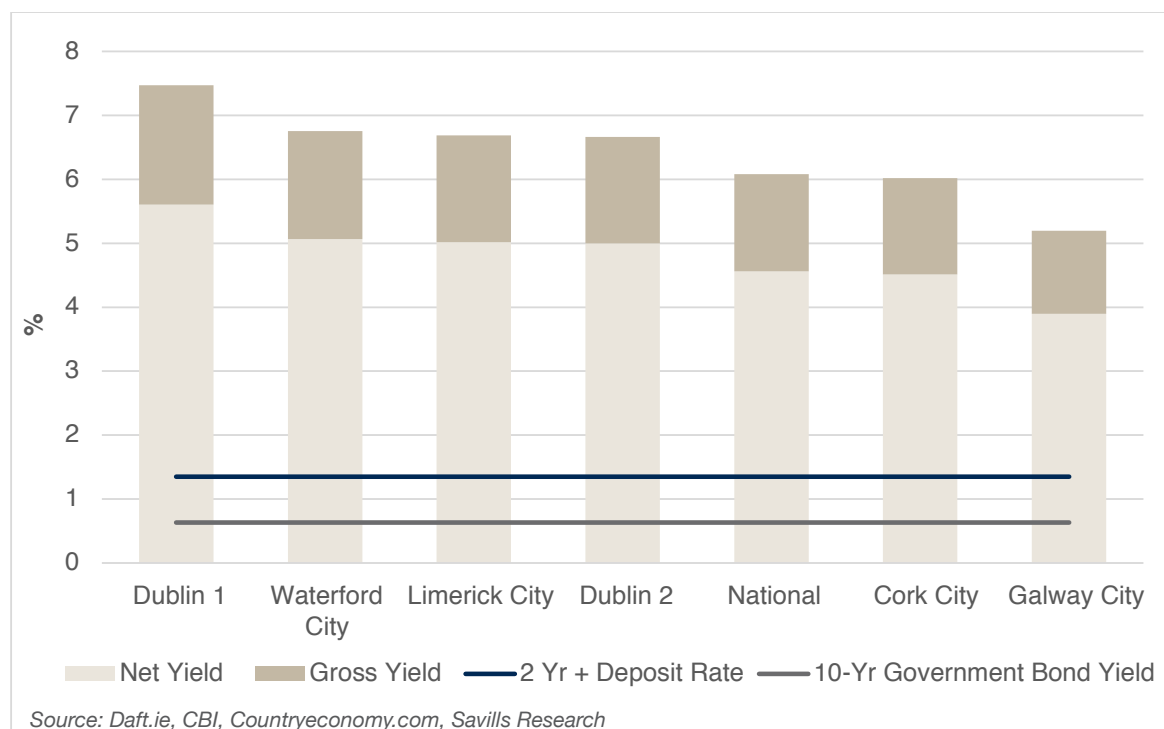
[12] Cost-increasing legislative changes in recent years have included; RTB registration fees (2004), withdrawal of the Countrywide Refurbishment Scheme (from 2008), Building Energy Rating certification (from 2009), reduction in mortgage interest relief for landlords (from 2009), Non-Principal Private Residence Tax (2009-2013), Universal Social Charge on Rental Income (from 2011), Household Charge (2012), Local Property Tax (from 2013), Pay Related Social Insurance on rental income (from 2014). Other legislative changes, e.g. The Housing (Standards for Rented Houses) Regulations 2008 (amended in 2009) increased costs but, by creating a higher quality product, arguably enabled landlords to recoup their additional expenses in higher rents. There have also been cost-reducing legislative changes e.g. the Home Renovation Incentive tax credit (2014-2016) and the re-introduction of 100% mortgage interest relief for landlords letting properties to social welfare tenants (from 2016). The Home Renovation Incentive Scheme was extended until end-2018 in the October 2016 budget, while the same Budget announced that mortgage interest relief for all landlords will be restored to 100% on a phased basis beginning in 2017.

6.1. Future trends in the Irish PRS

Savills' analysis indicates that large-scale block buyers have accounted for a significant proportion of investor sales in Dublin. Between Jan 2012 and June 2016 almost 12,000 housing units in Dublin were purchased as part of block deals – nearly 21% of all units that transacted during that time. This conclusion is broadly corroborated by the CSO's revamped property statistics which show that 'Non-Household' buyers accounted for 15% of sales over the same period. With the supply of residential blocks that are available to buy in bulk now drying up, opportunistic investment in multifamily housing is now diminishing.

This, however, does not spell the end of residential property investment in Ireland. The larger corporate investors are already transitioning towards a design-build-operate (DBO) model. While this will be invisible in sales transactions data going forward, large-scale build-to-rent activity will continue to expand the size of the private rental stock.

While the operating model of corporate investors is changing, the role of small-scale private investors should not be underestimated. These buyers respond to the same incentives as large corporations, and have been a big part of the housing market in recent years. CSO statistics show that small private investors were behind 15% of all residential purchases in Dublin since the beginning of 2012 and these buyers – particularly those that are moderately geared or entirely funded with cash - will remain active as long as net yields continue to offer a risk-adjusted premium on the returns that are available on bonds and deposits.

GRAPH 11

Investor share of residential purchases in Dublin

Source: CSO
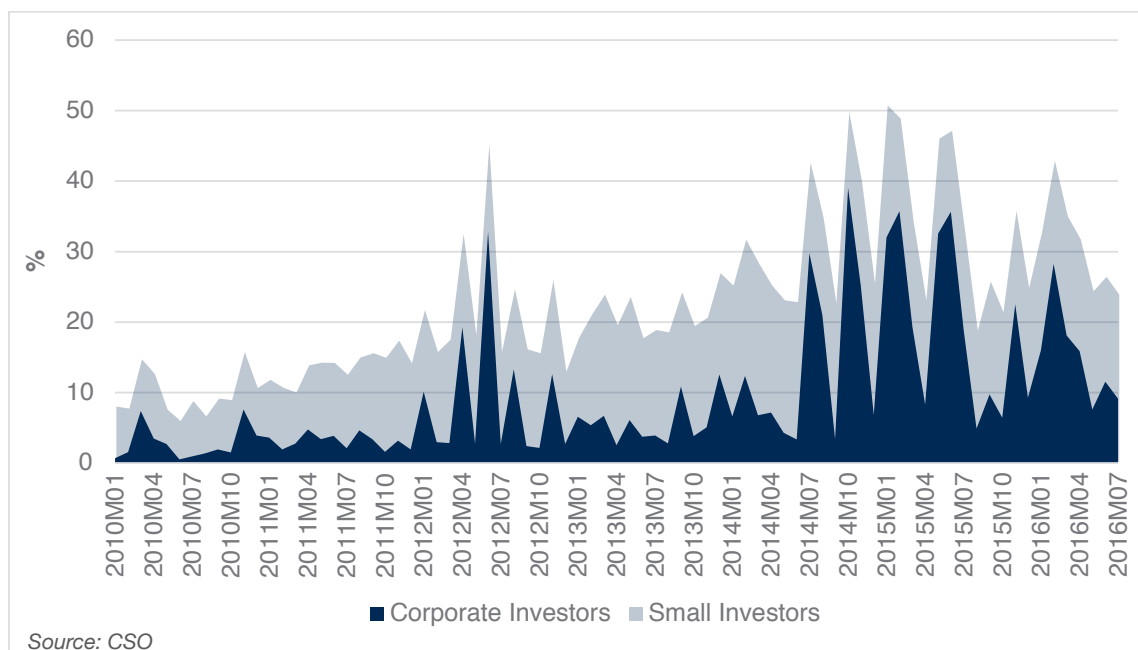
To conclude, despite the increased stock of private rented housing, supply has not kept pace with demand. This has driven up rents. And, based on a range of plausible vacancy rate assumptions, the analysis in this paper indicates that rental growth will continue for the foreseeable future with further compounding increases of around 25% likely over the next 30 months. Inevitably this will attract further capital into the sector and will continue to increase the size of the PRS.

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Appendicies

A.1.

Impact of Different Assumptions About Daft.ie Coverage of the Rental Market; 90% Vs 95 and 85% Market Coverage

	85%	90%	95%
NVR Estimates (%)			
National	6.08	5.77	5.48
Dublin	6.01	5.70	5.42
Ex. Dublin	6.09	5.78	5.50
Compound Real Rental Growth Forecasts Q3 2016–Q4 2018 (%)			
National	24.33	24.39	24.27
Dublin	23.73	23.79	23.84
Ex. Dublin	24.58	24.65	24.71

*The main effect of altering assumptions about Daft.ie's market coverage is on the NVR estimates – these are inflated by assumptions of lower coverage. However, because the actual vacancy rate is similarly increased, and because the forecasting model is driven by the gap between the actual and natural vacancy rates, the impact on rental growth forecasts is barely detectable.

A.2.

Impact of different vacancy rate assumptions on rental growth forecasts (Compound % Q3 2016 – Q4 2018)

	Low Rental Growth Scenario	Central Forecast	Hi Rental Growth Scenario
VR Assumptions	Q3 2016 – Q4 2017 VR falls by 0.05pp per quarter Q1 2018 – Q4 2018 VR rises by 0.2pp per quarter	Q3 2016 – Q4 2017 VR falls by 0.1pp per quarter Q1 2018 – Q4 2018 VR rises by 0.1pp per quarter	Q3 2016 – Q4 2018 VR falls by 0.15pp per quarter and vacancy is eliminated by Q4 2018
National	23.21	24.39	26.03
Dublin	22.79	23.79	25.16
Ex. Dublin	23.43	24.65	26.34

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