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**Dara Turnbull**

**June 2017**

**NERI WP 2017/No 44**

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# A long-term assessment of Irish house price affordability

Dara Turnbull<sup>1</sup>

**Keywords:** Housing, Affordability, Rent, Youth Affairs, Wages, Taxation

**JEL Codes:** E21, E24, H20, J12, J31, N34, R21, R31, R38

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## ABSTRACT

The issue of housing affordability has become a more pronounced part of the public discourse in the past decade or so. This reflects a number of issues, including higher house and rent prices, changing household formation patterns, stricter credit lending regulations and a misalignment between supply and demand for housing. This paper aims to use a number of different measures of housing affordability in order to assess the ease with which different types of income groups have been able to purchase residential property over a roughly 30-year period. This will include making a particular effort to assess affordability for younger people, using income data from a number of different sources. The paper also makes an effort to assess affordability in the context of the wider issue of the cost of living. The overall conclusion is that while housing affordability is more favourable today than at the height of the boom years, getting one's foot on the property ladder is still more difficult/burdensome than was the case a generation ago, particularly for younger people and those living in urban areas.

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<sup>1</sup> Dara Turnbull is an economist with Allied Irish Banks. This research was carried out in a personal capacity, and the views expressed are not necessarily the views of his employer. The author wishes to thank the staff at the NERI for their input. He would also like to thank Bertrand Maître and Micheál Collins for their helpful comments, as well as Morgan O'Donnell from the CSO for the provision of *ad hoc* income calculations. Any errors are entirely the author's responsibility. Further observations and comments on this working paper are welcome. These can be directed to the author: [daraturnbull@hotmail.com](mailto:daraturnbull@hotmail.com)



# **A long-term assessment of Irish house price affordability**

**Dara Turnbull**

## **1. INTRODUCTION**

As a topic of study, housing affordability has become more prevalent in recent years, with interest in the topic reaching a peak in the years following the global financial crisis seen in the latter half of the last decade (*Li, 2014*).

In an Irish context, *Duffy (2004)*, *NESC (2014)*, *Indecon (2016)* and *DKM (2016)* are some of the few sources of research on housing affordability. The Irish literature on residential property has been primarily concerned with describing changes in prices and underlying property market dynamics, particularly in the lead up to and aftermath of Ireland's recent housing market crash (see: *Browne et al. (2013)*, *Norris & Coates (2014)* and *Kennedy and Stuart (2016)*), rather than the social consequences of the sector's evolution.

One of the main innovations of this paper is that it will attempt to answer the question of whether or not owning a property is more or less affordable today for a typical young person than was the case a generation ago. To achieve this, a time series on youth earnings (25-34 year olds) is constructed using data from the Central Statistics Office (hereinafter: CSO) Household Budget Survey (HBS), the National Employment Survey (NES) and the Earnings Analysis using Administrative Data Sources (EAADS). This is, as far as the author can discern, a first in an Irish context. As *Duffy (2004)* points out, analysis of housing affordability "*has been hampered by the fact that income data in Ireland is confined mainly to the industrial sector*". This paper seeks to take a broader look at the spectrum of earnings in Ireland and how affordability has evolved for different groups in recent decades.

In general, the study of housing affordability for younger people seems to be often discussed, but rarely empirically analysed. *McKee (2012)*, *ONS (2016)* and *White (2016)* shed some light on the situation in the UK. They typically find that "*young people are being increasingly excluded from accessing the housing ladder*" (*McKee, 2012*) and that a so-called 'Generation Rent' is emerging.

*NESC (2014)* outlines the changing face of household formations in Ireland, showing that “*younger age groups are buying at an older age*”, with this trend evident since 1991. They also find that the removal of Government support schemes to buy property from the mid-80s on has meant that people from lower socio-economic backgrounds have little prospect to buy their own home (also see: *Fahey, 2004* and *Norris and Winston, 2013* for discussions on this). This suggests that residential property has become less affordable for some groups during the period of observation of this paper, namely 1987-2016.

This paper will proceed as follows; in the second section, we will take a look at the dynamics which have underpinned changes in housing affordability in Ireland at a national level. Section 3 will then seek to quantify the changes in housing affordability using a number of different metrics. Section 4 will look specifically at the issue of affordability in Dublin. Section 5 will offer some additional insights and conclusions.

## **2. DYNAMICS UNDERPINNING IRISH HOUSING AFFORDABILITY**

### ***2.1 House Prices***

This research uses house price data from the Department of Housing, Planning, Community & Local Government<sup>2</sup> (DoH), as well as figures from the CSO<sup>3</sup> to create long-term estimates for national average house prices.

To do this, we follow the technique outlined by *Duffy (2011)*. The data from the DoH record the average price of new and second hand property prices. Data on the number of loans paid by property type are also provided. Using these two pieces of information a ‘weighted’ average house price is constructed.

However, the DoH figures are a simple average, and thus, they do not control for changes in the mix of properties purchased in a given period. Thus, the CSO property price data, which uses a hedonic regression methodology in order to control for such changes (see *O’Hanlon, 2011* for a detailed overview of the index), but which only began in 2005, is ‘spliced’ together with the DoH

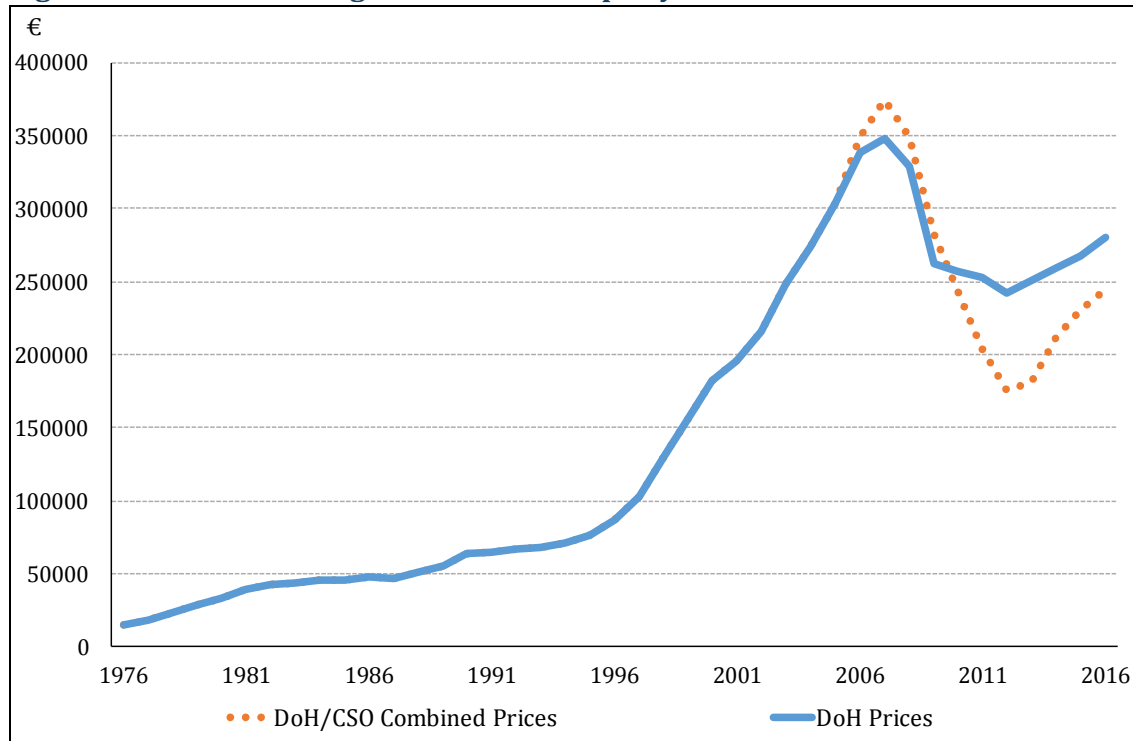
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<sup>2</sup>See : <http://www.housing.gov.ie/housing/statistics/housing-statistics> for historical house price and mortgages paid data

<sup>3</sup>The CSO ‘Residential Property Price Index’

data for the period 2005-2016. The differences in the estimations of average nominal house prices is presented in Figure 1.

**Figure 1 : National Average Residential Property Prices**



Source: Dept. of Housing, CSO, Author's own calculations

Notes: 2016 figure for DoH Prices is an estimate based on Q1-Q3 data

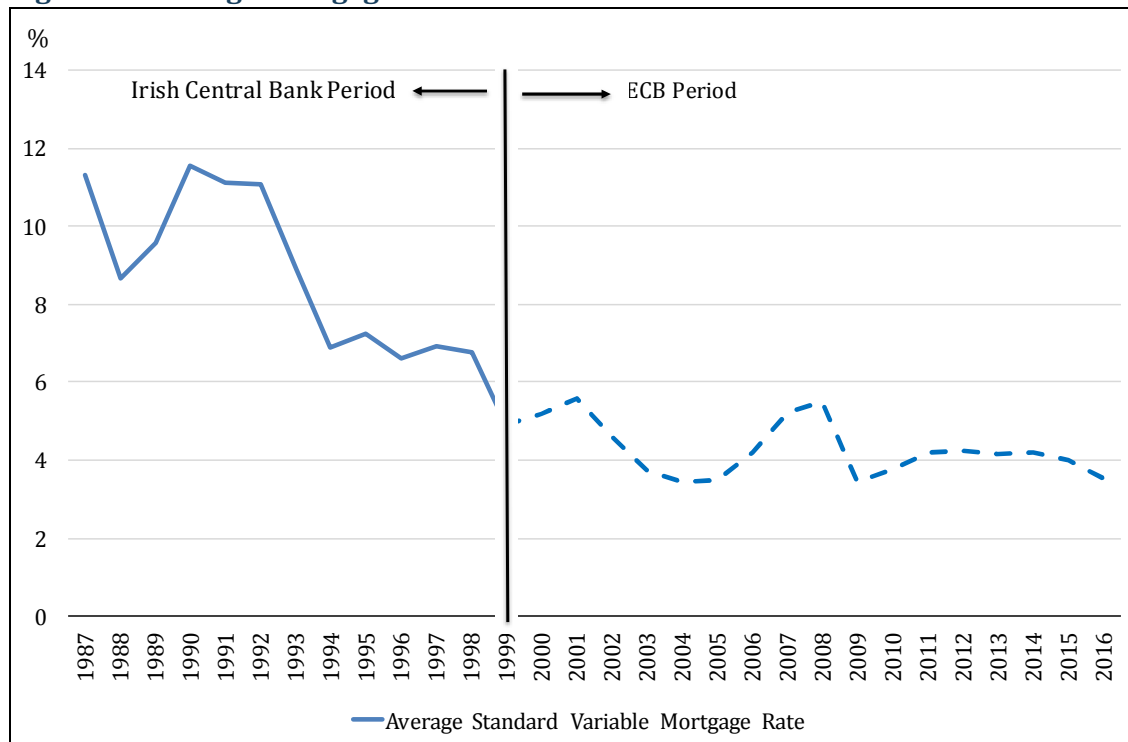
The combined DoH/CSO measure shows that house prices rose higher on an average annual basis (2007 peak of €374,660) and fell further following the crash (2012 trough of €175,972) than using the unadjusted DoH data alone (peak €347,330 / trough €242,652). The 'spliced' measure also shows that house prices today are lower than is shown by the DoH measure (€244,694 in 2016 versus €280,430).

The sharp increase in prices seen between the mid-90s and the peak of the Irish property market in 2007 has been attributed to a number of factors. These include fiscal policies which created a bias towards home ownership, as price increases exceeded funding costs (*Browne et al, 2013*), as well as an expansion in the number of lenders and range of mortgages, combined with more favourable lending terms (*Norris and Coates, 2014*). The current strong recovery in house prices reflects solid underlying economic activity, as well as housing completions falling well short of market demand (*IMF, 2017*), (*Duffy et al., 2016*).

## 2.2 Mortgage Interest Rates

The trend in Irish standard variable mortgage rates in the period 1987-2016 can best be described if broken into two periods. The period up to 1999, during which monetary policy came under the purview of the Central Bank of Ireland (CBI), and the period from then until the present day when interest rate setting powers passed to the European Central Bank (ECB).

**Figure 2 : Average Mortgage Rate**



Source: CBI, CSO

Ireland's membership of the currency bloc has seen the cost of credit fall (*McCarthy and McQuinn, 2013*), which in turn has fed through to lower average variable mortgage rates (*Norris and Coates, 2014*). The average mortgage rate in the period 1987-1998 was close to 9 per cent. Since joining the ECB, the average rate has been around 4 per cent.<sup>4</sup>

This has had a positive impact on housing affordability. Although, it must be noted that lower mortgage rates were also likely to have been a factor behind rising demand for housing and thus, higher house prices, somewhat mitigating the positive impact of lower rates.

<sup>4</sup> This is based on the average Standard Variable Mortgage Rate charged by Irish lenders. Data for the period 1987-2013 (inclusive) are taken from an unpublished series available from the CBI. Data for 2014-present are taken from CBI Table B.3.1 (Retail Interest Rates – Lending for Home Purchase)



## 2.3 Earnings

For the purposes of this study, affordability will be measured relative to the earnings of a couple (i.e. a two-income prospective household). This reflects the fact that initial analysis of the issue of housing affordability for this paper highlighted that it was now very difficult for an average single worker to meet the lending criteria and sustain the financial burden of a typical mortgage in many areas of the country.

This paper differs from most analysis of housing affordability by using average incomes for a number of different groups, rather than just using one average wage measure. Four income earning couples will be considered in all, namely:

1. Both earning the average industrial wage
2. Both earning the OECD estimate of Irish average earnings
3. A 'Public Servant' proxy (this is taken to be a typical member of An Garda Síochána living with a typical public sector 'educator')
4. A young couple; where both partners are working and aged between 25 and 34

Taking a number of different measures of income will broaden the scope of our understanding of the issue of housing affordability. The inclusion of an estimate of the average earnings of a 'young' couple is important as the argument could be made that since older people are less likely to be attempting to buy a house than younger people, using a measure of income which includes them is to distort our perception of affordability. It is also the case that older workers tend to be better paid than younger workers, thus a simple average of all earners is likely to paint a more positive picture of housing affordability than is really the case for the typical prospective buyer.

Table 1 provides a breakdown of average earnings for the various income groups in a selection of years. A detailed overview of these different wage measures can be found in Appendix A.

**Table 1: Average Gross Combined Annual Earnings of a Working Couple**

Year	Average Industrial	OECD Average	Public Servant (Garda/Teacher)	Young (25-34)
1988	27,584	N/A	42,915	25,399
1994	35,105	45,010	59,115	29,420
1999	42,680	58,656	71,145	36,841
2004	58,477	79,952	97,393	63,027
2009	83,713	97,670	112,489	70,710
2014	88,660	94,024	110,088	62,282

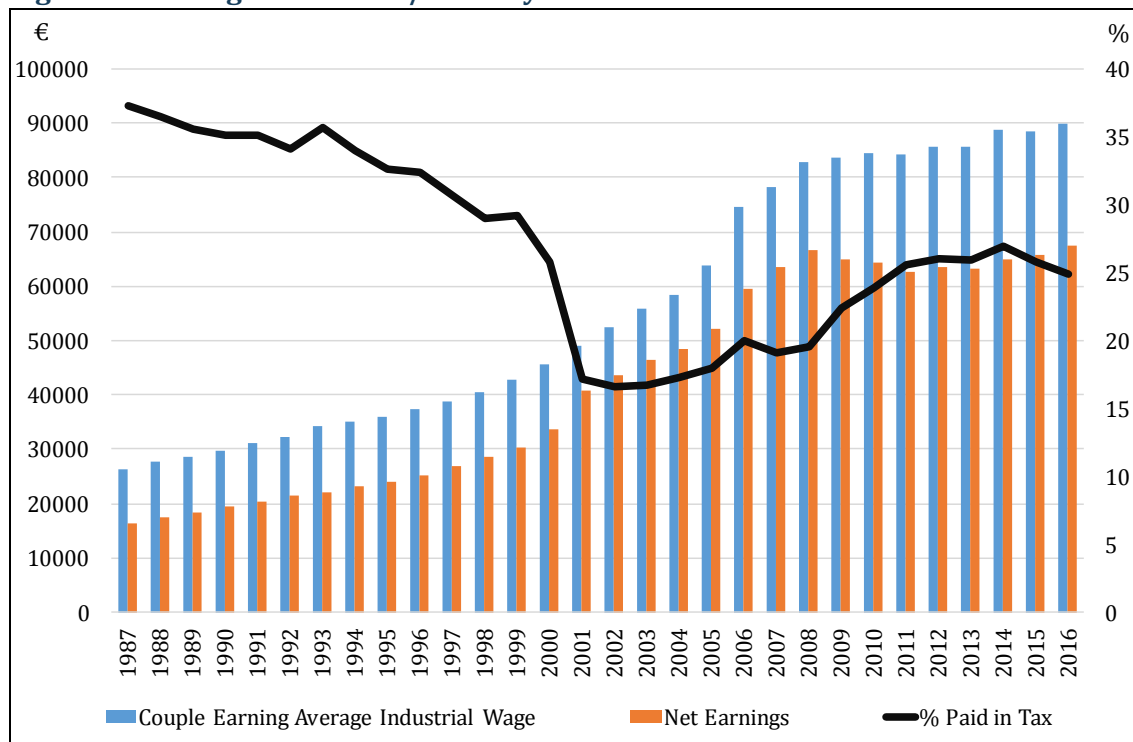
Note: All figures are in euro

## 2.4 Taxation of Income

Most of the discussion of affordability in this paper will be in relation to net, after tax income. Therefore, it is important to consider the changes in personal income tax which we have seen in recent decades.

Using information on taxation and credits from the Department of Finance a taxation model for Ireland in the years 1987-2016 has been constructed. Using this and earnings figures from the CSO suggests that the percentage of income paid in direct taxation that a hypothetical couple, both of whom are earning the average industrial wage, is on the whole lower today than in 1987.

**Figure 3 : Average Industrial / Tax Payment**



Source: CSO, Dept. of Finance, Author's own calculations

Reductions in tax rates and widening tax bands saw the level of personal taxation for this couple (and indeed the wider spectrum of income earners) fall from 1987 until around 2002, after which it remained relatively stable. When the financial crisis hit, additional revenue raising measures introduced from 2009-2011 (e.g. health levy, universal social charge, abolitions of the PRSI ceiling) saw the percentage paid in tax begin to rise again. Although, efforts have been

made in recent budgets to reduce it. However, the current level of Government debt (€201bn in Q4 2016)<sup>5</sup> means that scope for further reductions is likely to be limited.

As with the reduction in mortgage rates, higher levels of disposable income likely helped to fuel the sharp increase in property prices seen during the 'Celtic Tiger' years (*McQuinn and O'Reilly, 2006*). Increased tax liabilities since then have contributed to issues around affordability, though they may also have served to stop house prices from recovering more quickly than otherwise could have been the case.

## ***2.5 Other factors impacting on mortgage affordability***

Other issues have affected the level of housing affordability over the period 1987-2016. For example, mortgage interest relief (MIR) was offered until the end of 2012. This payment was potentially worth several thousand euro per year to mortgage holders.

For example, someone buying an average house in 2008, costing €348,495 and paying interest at 5.5 per cent could have availed of MIR of €3,456 that year. While lower average house prices today mean that MIR would be less generous were it still in existence, it would still represent a significant boost to the ability of households to meet their annual mortgage repayments. Indeed, the tax incentives offered by the Government to purchase property outweighed any taxation based disincentives (i.e. property tax or stamp duty) in the 1987-2012 period (after which MIR was phased out), having a negative impact on the user cost of residential property (*Browne et al., 2013*). *Blackwell (1988)* estimated that households paying the top income tax rate with a mortgage interest rate of 8.8 per cent had an effective interest rate of 4.2 per cent as a result of MIR.

Another issue is saving for a deposit. Current CBI regulations mean that this must be at least 10 per cent of the cost of a house.<sup>6</sup> For those prospective house buyers who must save to meet this requirement, this can be a challenge. For example, figures from both Daft.ie and the CSO suggest that nominal rent prices are currently at an all-time high.<sup>7</sup> Thus, renting while saving for a

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<sup>5</sup> Taken from CSO's 'Government Finance Statistics Quarterly Results – Quarter 4 2016'

<sup>6</sup> The Government's new 'help-to-buy' scheme only began at the start of 2017, and as such, it is outside the scope of this research, though early figures on changes in house prices suggest that it has simply served to drive up house prices further (see: CSO 'Residential Property Price Index February 2017')

<sup>7</sup> Based on unpublished Daft.ie rental series available on request and the 'private rents' sub-index of the CSO's CPI inflation series; see CSO table 'CPM16: Consumer Price Index by Detailed Sub Indices, Month and Statistic' for figures from 2003-present. Longer term data series available from CSO on request

deposit can pose a significant challenge. The issue of the cost of living will be discussed in more detail in section 3.4.

### **3. IN-DEPTH ASSESSMENT OF HOUSING AFFORDABILITY**

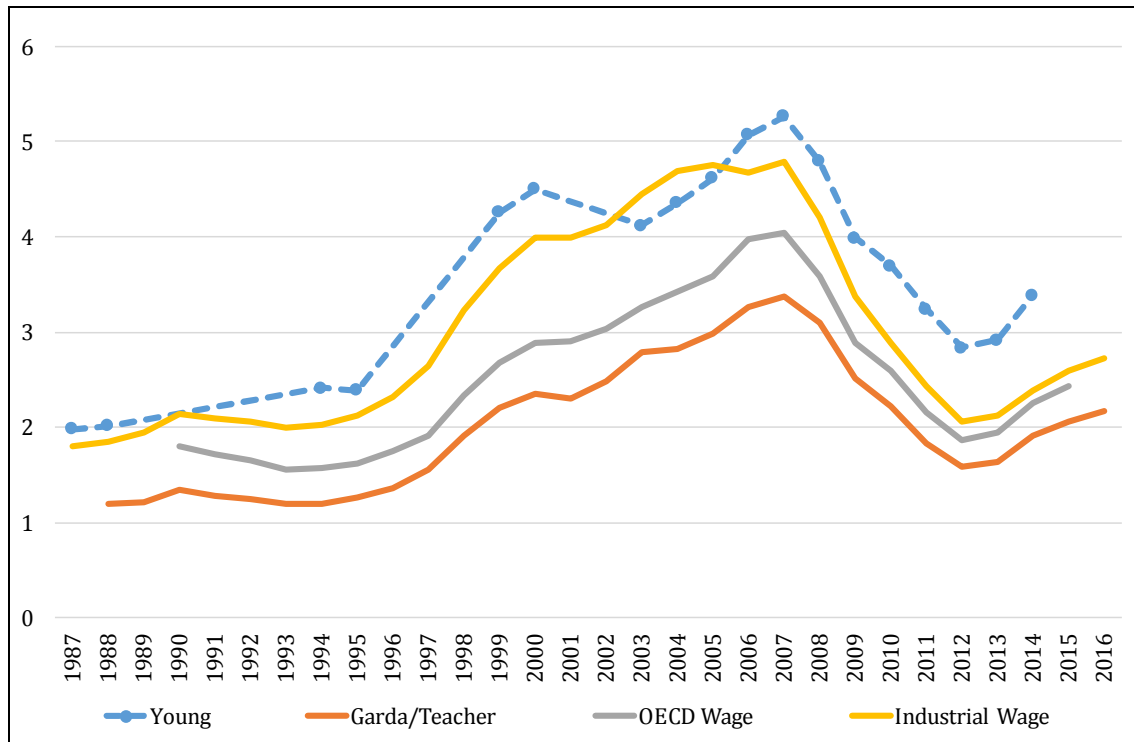
#### ***3.1 House price to gross earnings ratio***

The first measure of house price affordability that this paper will consider is the most commonly found in the literature, a measure of the ratio of house prices to gross earnings. This is also a key assessment criterion for mortgage affordability set out by the CBI macroprudential rules, which state that a mortgage in not to exceed 3.5 times gross earnings (*CBI, 2016*).

A major limitation of this measure is that it does not directly measure affordability for households who actually buy a home (*Indecon, 2016*), but rather affordability based on some notional level of average income. However, this critique applies to almost all measures of housing affordability. The fact that this research uses four different categories of income is an attempt to broaden the scope and relevance of the analysis.

The ratio of gross earnings for our four couples/income groups to the average national property price was broadly stable between 1987 and 1996 when it started to increase. This reflects the beginning of a decade of strong property price growth, outstripping wage growth. The ratio peaked in 2007 at the height of the property boom, before reaching a trough in 2012. The ratios are higher today for all income categories than at at the end of the 80s/early 90s. This is particularly the case for the young couple.

**Figure 4 : Gross Earnings to Average National Residential Property Price**

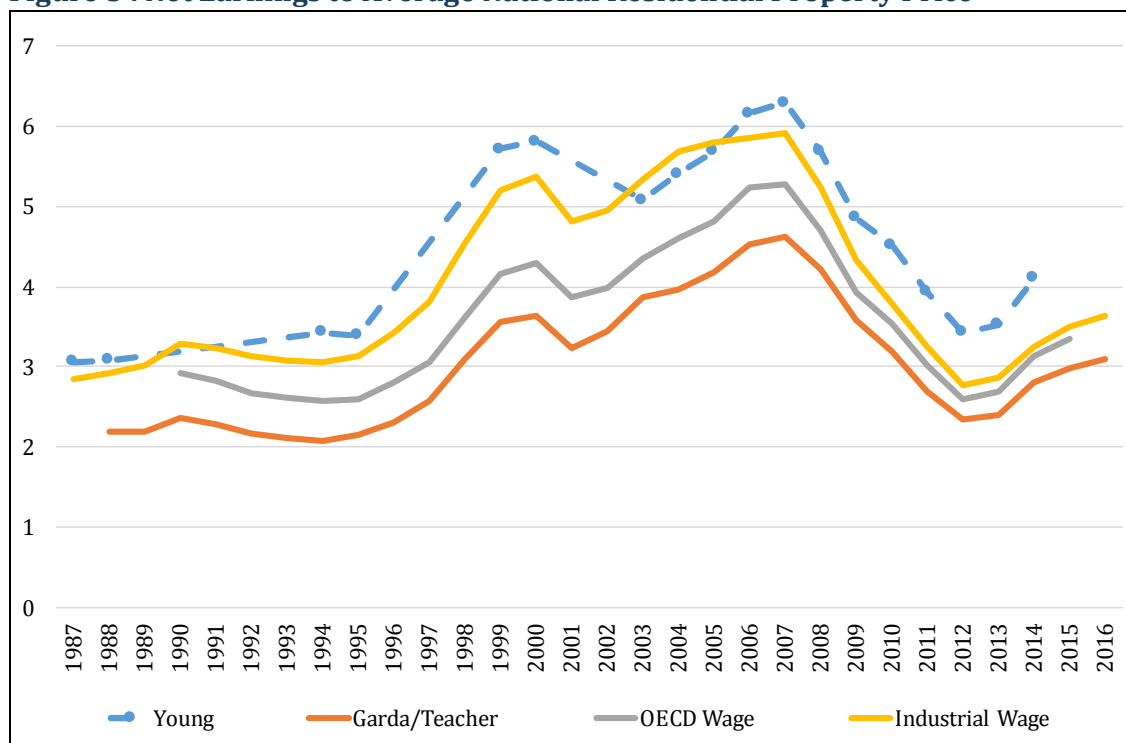


Source: CSO, OECD, Author's calculations

### 3.2 House price to net earnings ratio

While the Central Bank is concerned with gross earnings, this measure does not give a fair picture of a couple's true mortgage repayment capability. As outlined in Section 2.4, personal taxation in Ireland in the past 30 years has not been consistent, with the level of direct liability higher in the late 80s than even today, despite the introduction of additional revenue raising measures at the onset of the recession.

**Figure 5 : Net Earnings to Average National Residential Property Price**



Source: CSO, OECD, Author's calculations

Net earnings to average house prices have followed the same general trend as the gross earnings based ratio. However, the ratios are higher, showing a more realistic view of the level of the financial burden that a typical couple in one of our four income groups would have taken on when taking out a mortgage. Although, many earners will of course earn higher than average wages as their careers progress, in theory reducing the burden over time.

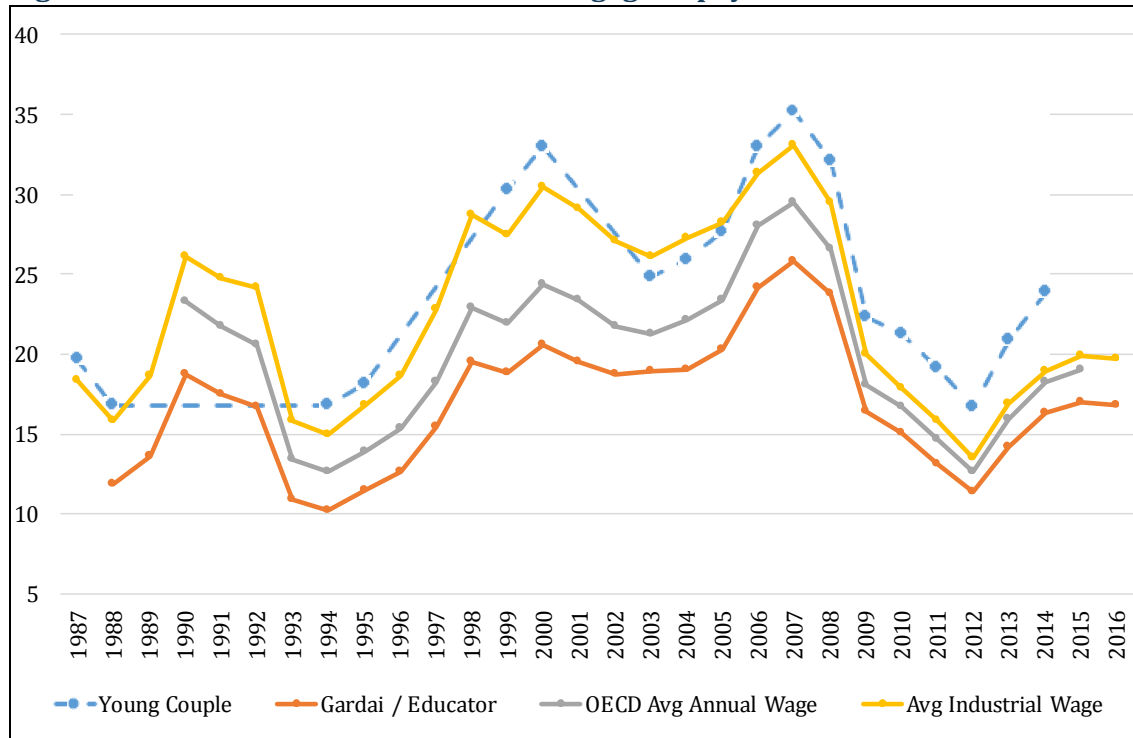
A comparison of Figures 4 and 5 shows that, taking the example of a young couple, the gross price to earnings ratio in 1987 would have been 2.0, peaking at 5.3 in 2007, while having come in at 3.4 in 2014. The net earnings ratio for the same years was 3.1, 6.3 and 4.1. Both measures highlight the greater relative increase in house prices in recent decades compared to earnings.

### ***3.3 Percentage of Net Annual Earnings Committed to Mortgage Repayments***

Another common method for measuring the affordability of residential properties is the percentage of net earnings required to meet annual mortgage repayments. Such a calculation is a function of gross earnings, the personal taxation system in a country, including tax credits, mortgage interest rates, the length of a mortgage and property prices.

Figure 6 shows the level of the mortgage repayment burden for our four income groups over the period 1987-2016.<sup>8</sup> The results show that the least affordable time to buy a house in the last 30 years was, not surprisingly, at the height of the housing boom in 2007. By contrast, 1994 and 2012 were both relatively good times to have purchased a home. The former as a result of the Government of the day's effort to reduce the level of direct tax liability combined with still subdued property price growth. The latter corresponds to the post-crash trough in prices.

**Figure 6 : Net Income to Meet Annual Mortgage Repayment**



Source: CSO, OECD, Dept. of Finance, Author's Calculations

The crash in average national property prices between 2007 and 2012 (peak to trough decline of 53 per cent using our 'spliced' property price estimate) saw affordability improve drastically. Rising prices and relatively subdued wage growth have seen the level of net income required to meet mortgage repayments rise to levels roughly comparable to the late 80s/early 90s.<sup>9</sup>

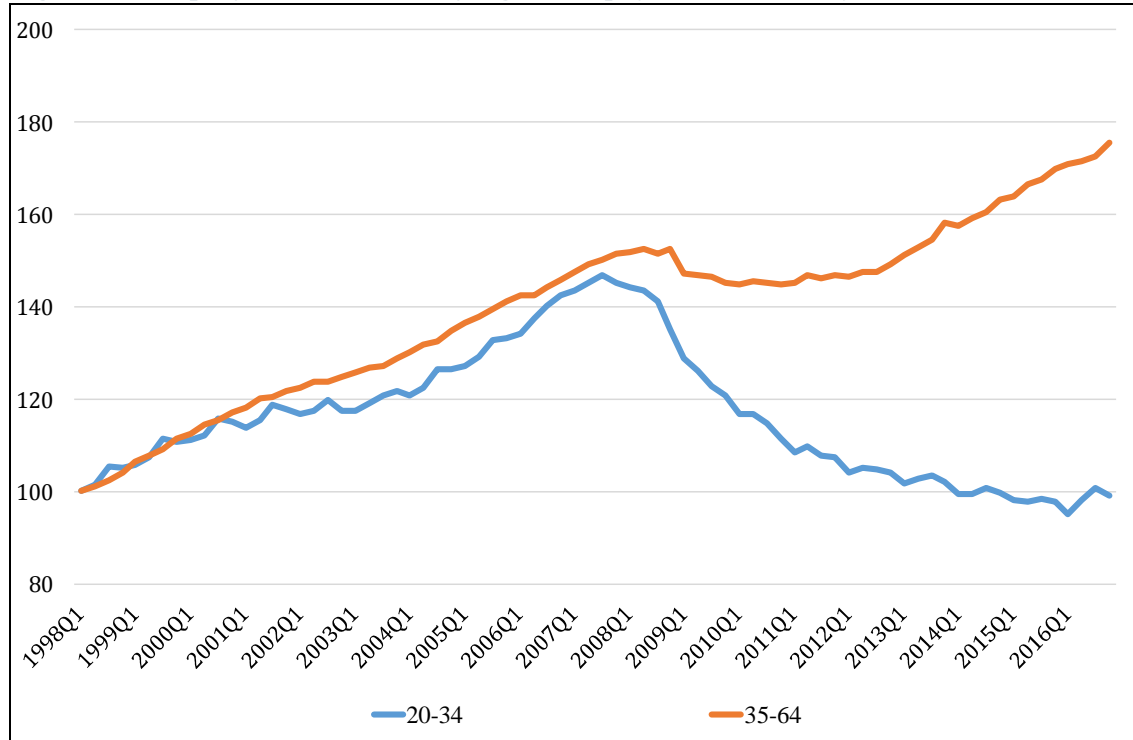
Once again though, young couples are the exception to this. Data suggest that this group's earnings were disproportionately negatively effected during the economic downturn. *Gerlach-Kristen (2013)* shows using inflation adjusted HBS figures that "[b]etween the 2004/05 survey

<sup>8</sup> This is based on a couple, with no children, receiving no state transfers, both of whom are earning the average wage for their income group, purchasing the average priced national property at the average standard variable mortgage rate with a 25-year repayment period and a 90 per cent LTV

<sup>9</sup> Note: This research does not take account of the new property tax given the number of people who are exempt from paying it and the non-uniformity of rates by local authority. It too has negative consequences for affordability that are not accounted for here

and that of 2009/10, real disposable income decreased by 14 per cent” for younger households. Real disposable income for older households (head of household over the age of 45) appears to have actually increased over the period.

**Figure 7 : Employment Growth by Age Group (Q1 1998 = 100)**



Source: CSO, Author’s Calculations

The evolution of employment for younger people from mid-2007 to the present day supports the view that young people shouldered a significant bulk of the negative impact from the recession. From its peak in Q3 2007 to Q4 2016, the number of people aged 20-34 in employment in Ireland is down 33 per cent, while over the same period employment in the 35-64 age band is up 17 per cent.<sup>10</sup>

**Table 2: Tenure of Irish Households (Head of Household 25-34) (%)**

	Own Outright	Own with Mortgage	Renting from Private Landlord	Renting from Local Authority
1991	9.1	59.3	15.3	12.4
2011	3.0	39.3	44.3	8.7
2016	5.0	25.0	50.8	10.2

Source: NESI (2014) and Census 2016 – Profile 1 – Housing in Ireland (Table E1016)

<sup>10</sup> Author’s calculations based on data taken from CSO table ‘QNQ24: ILO Participation, Employment and Unemployment Characteristics by Age Group, Sex, Quarter and Statistic’



One result of the difficulties in affording a mortgage for younger people has been a steady decline in the rate of home ownership. Census data for various years show that the percentage of head of households aged 25-34 with a mortgage fell from 59.3 per cent in 1991 to 25 per cent in 2016. In the same period the numbers renting from a private landlord increased from 15.3 per cent to 50.8 percent. While this also reflects changing lifecycle preferences of young people, such as forming family units at an older age, a lack of affordable housing is itself a factor in these changing patterns.

For example, *Aksoy (2016)* shows that rising house prices lead to lower fertility rates for young renters, as they put off starting a family until they can afford permanent accommodation. This is also suggested by *Turffrey (2010)*, who, in addition, suggests that high house prices have a negative impact on young peoples' ability to start and maintain relationships, which likely explains the trend towards getting married at a later age, when income tends to be higher and accommodation more affordable. *Lauster (2006)* finds a significant positive correlation between greater access to housing and the level of family household formation.

Figures from the CSO show that in the 17 years from 1980 to 1996 the average age of a first time mother in Ireland increased by roughly two years from 25 to 27 years of age.<sup>11</sup> In the 17 years from 1998 (around the time that the marked uptick in house prices began) to 2015, the average age increased by nearly four years from 27 to 31. The average age of a bride increased by almost 10 years between 1980 (24.4 years) and 2016 (33.8 years)<sup>12</sup>. Of course, this reflects myriad factors and further research would be required to quantify what role, if any, changes in house price affordability have played in this.

### ***3.4 Affordability of a Housing Deposit***

While the burden of affording a mortgage today may not be significantly worse than in the late 80s for most income groups, with the 'young' group a notable exception, this only represents one part of the issue of affordability. One must also be in a position to be able to take out a mortgage, meeting certain lending requirements, such as providing at least 10 per cent of the price of a property up front. *Indecon (2016)* notes the emergence of a so-called 'deposit barrier' to accessing the housing market, which it states is "*now the most significant obstacle to home ownership*".

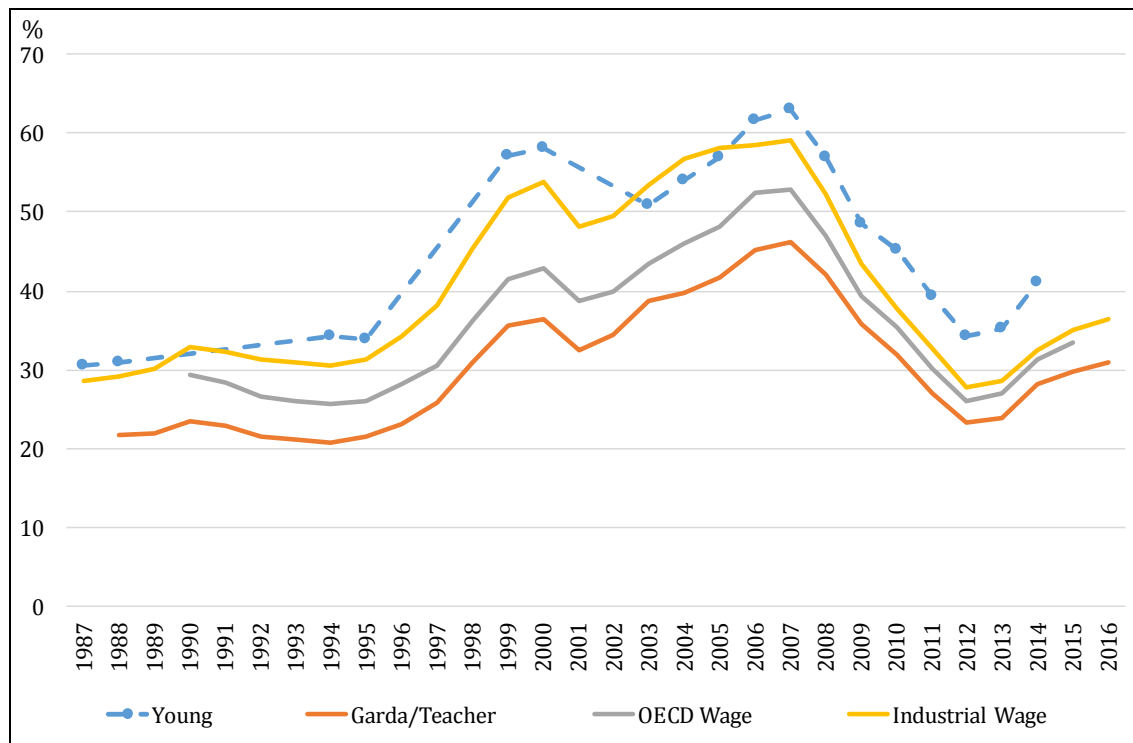
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<sup>11</sup> Based on 'Births Occurrence (Final): Table VSA17' available from the CSO Statbank

<sup>12</sup> See CSO 'Report on Vital Statistics 1980' and 'Marriages and Civil Partnerships 2016'

Figure 8 shows that the percentage of one of our couples' net annual income required to meet a 10 per cent mortgage deposit. It is higher for all income groups in recent years than at the start of the period of assessment, with the young couple once again being particularly put upon. They would have needed to save 41 per cent of net annual earnings to afford a deposit in 2014, compared to 31 per cent in 1987.

**Figure 8 : Mortgage Down Payment as Percentage of Net Annual Income**



Source: CSO, OECD, Dept. of Finance, Author's calculations

However, the analysis ignores changes in the cost of living, which will affect a prospective buyer's ability to save for a deposit. When living expenses are low, saving is less of a challenge than when they are comparatively high.

Unfortunately, long-term data on the costs of living are not available in Ireland. By this it is meant estimates of the cost of meeting basic needs such as food, transport and shelter while forgoing more discretionary spending. The Insolvency Service of Ireland (ISI) estimated that reasonable monthly living expenses for a couple with no children, one car and paying €1,200 in rent to have been €2,686.62 in 2016.<sup>13</sup> This really represents the bare minimum in terms of living expenses, as it is what is recommended for those trying to deal with insolvency. Thus, true minimum living expenses, where some sort of decent standard of living is maintained, are likely

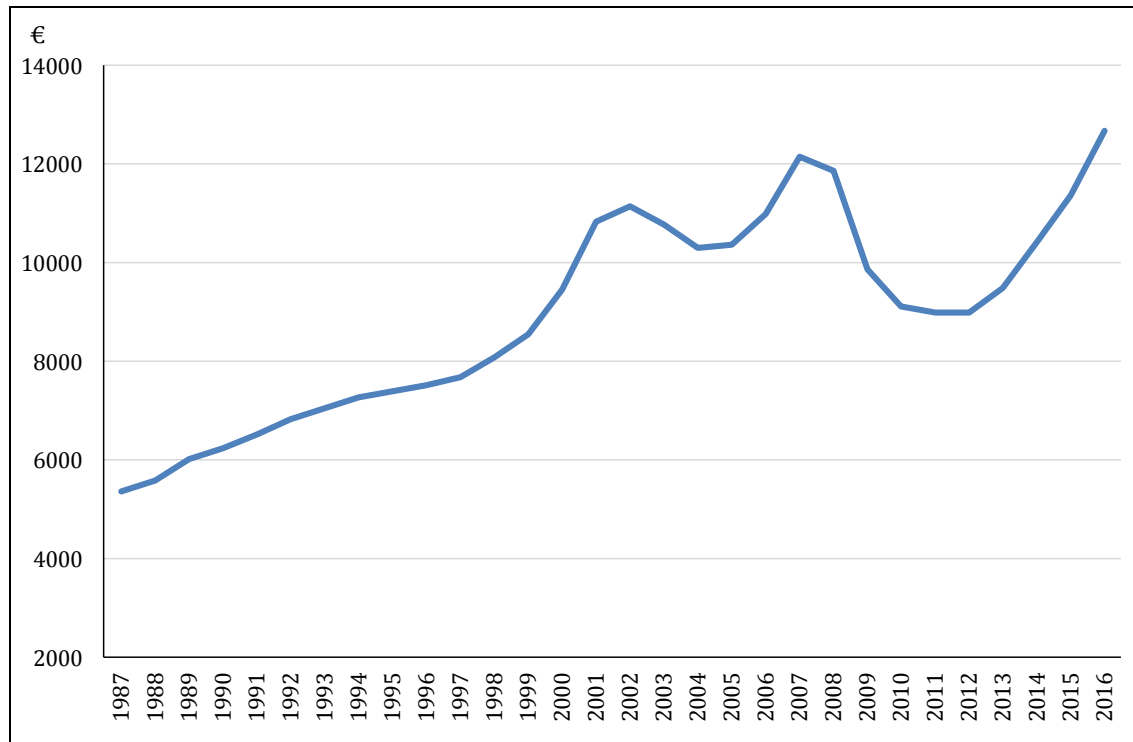
<sup>13</sup> See : [https://www.isi.gov.ie/en/ISI/Pages/Calculate\\_RLE](https://www.isi.gov.ie/en/ISI/Pages/Calculate_RLE)

to be higher. Living expenses form a key variable in the ability to save for a deposit (*Indecon, 2016*).

However, one major source of expenditure for which we do have data is rent. If we assume that a couple seeking to buy a house have to pay a private landlord to put a roof over their heads while they save for a deposit, then changes in the price of a typical rental property will have an impact on the timeframe in which they can amass the required down payment. Rent prices also form a key factor in household formation rates for younger people. Household formation for those aged 25-34 increased strongly from 2008 until 2013, at which point the pace began to slow (*Byrne et al., 2014b*), corresponding to falling and rising rent prices over the period.

Using hard data on average national rent from Daft.ie<sup>14</sup> as well as the 'private rent' sub-index of the CSO's CPI index (base 2016) we can estimate a long-term average annual cost of renting a home in Ireland.

**Figure 9 : Average Annual Private Rent**



Source: Daft.ie, CSO, Author's Calculations

One obvious drawback of estimating an average rental price in this way is that it represents an average price for all rental properties, rather than just those most likely to be rented by a two

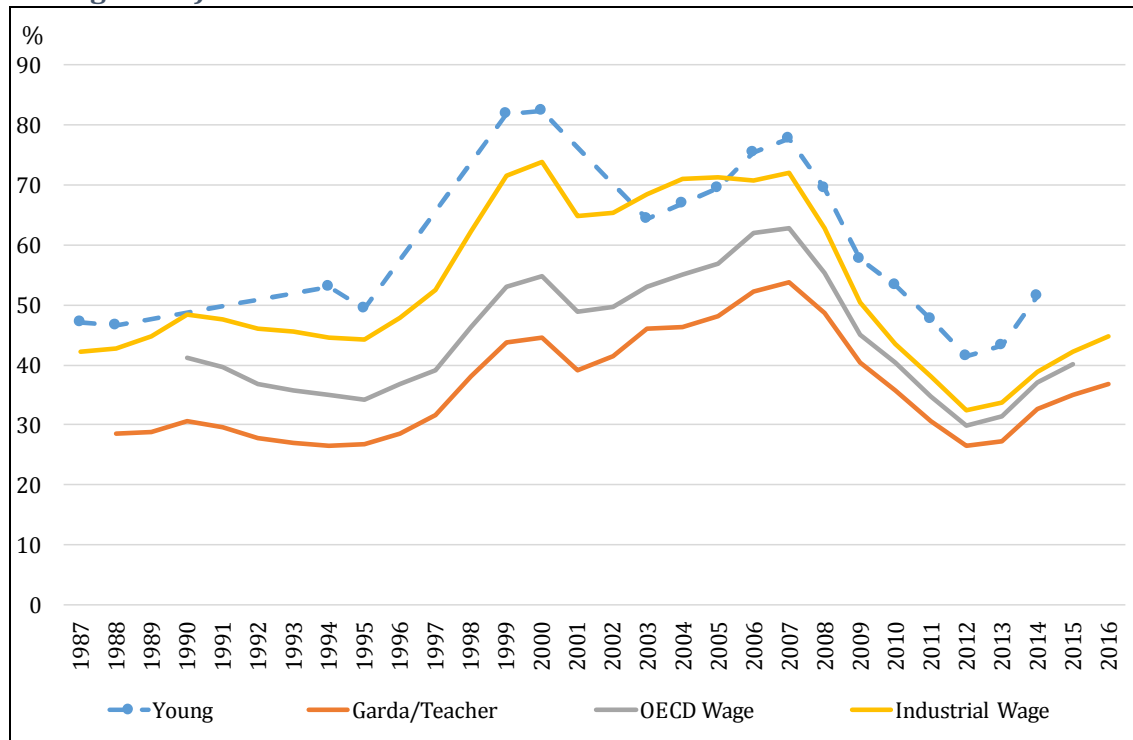
<sup>14</sup> This is taken from an unpublished dataset available from Daft.ie on request

adult household, such as apartments or properties with relatively few bedrooms. Nonetheless, in the absence of a long-term dataset on rental property prices broken down by property type, this seems the only methodological option available.

Figure 10 presents the level of a couple’s net annual income (minus cost of an average rental property) that is required to afford a 10 per cent deposit on a house.<sup>15</sup> For a young couple in 2014 it amounted to 51 per cent of net income, versus a slightly more modest 47 per cent in 1987. However, Table 2 suggests that the number of young couples renting private property in 1987 would have been relatively small compared to today.

A couple both earning the average industrial wage would have had to save 45 per cent of net earnings in 2016, compared to 42 per cent in 1987. With increases in private rents and house prices continuing to outpace growth in average earnings, saving for a deposit is likely to become more and more difficult.

**Figure 10 : Mortgage Down Payment as Percentage of Net Annual Income (Minus Average Rent)**



Source: CSO, OECD, Dept. of Finance, Daft.ie, Author’s Calculations

<sup>15</sup> Please note that in the years 1995-2010, a tax deduction/credit was available to those renting from a private landlord. This has been applied to the results in Figure 10 for the relevant years. For more information, see *Revenue Commissioners (Various Years)*. Credits/deductions are not factored into the results presented in Figure 9.

There is a significant body of international literature which suggests that higher housing costs and difficulty in affording a deposit discourage some to the point that they simply give up on trying to afford a down payment and resign themselves to renting indefinitely (*Mayer and Engelhardt, 1996*). *Engelhardt (1994)* showed that in the US a 5 per cent increase in house prices decreases the likelihood of saving for a down payment by 1 percentage point, holding income constant.

Research from the CBI shows that Irish renters typically begin saving for a house at a later age than the European average. The peak level of saving for a deposit in Ireland takes place in the 31-35 age category (approx. 35% saving), while in the rest of Europe the peak is in the 26-30 category (*Kelly and Lydon, 2017*). There is also a distinct bias in those saving for a mortgage towards the top half of the income distribution, suggesting lower paid renters have become discouraged by high property prices relative to disposable income.

#### **4. THE CASE OF DUBLIN**

Given that growth in house prices in Dublin has tended to outpace the national average in recent decades (nominal Dublin house prices rose 558 percent between 1987 and 2016 versus a 421 per cent rise in the national average),<sup>16</sup> as well as the fact that, comprising roughly 30 per cent of Ireland's inhabitants, it is by far the State's most heavily populated area<sup>17</sup>, we will give special credence to housing affordability dynamics in Dublin.

##### ***4.1 Dublin Housing Prices***

The trend in Dublin house prices broadly matches the national trend outlined in Section 2.1. Once again using the splicing technique of combining figures from the DoH and the CSO<sup>18</sup> we can track the evolution in average prices.

The 'spliced' measure shows that average annual Dublin prices peaked at €492,503 in 2007, before reaching a trough of €210,069 in 2012. They averaged €327,288 in 2016. By contrast, the pure DoH measure peaked a year earlier in 2006 at €459,103 before declining to €308,465.

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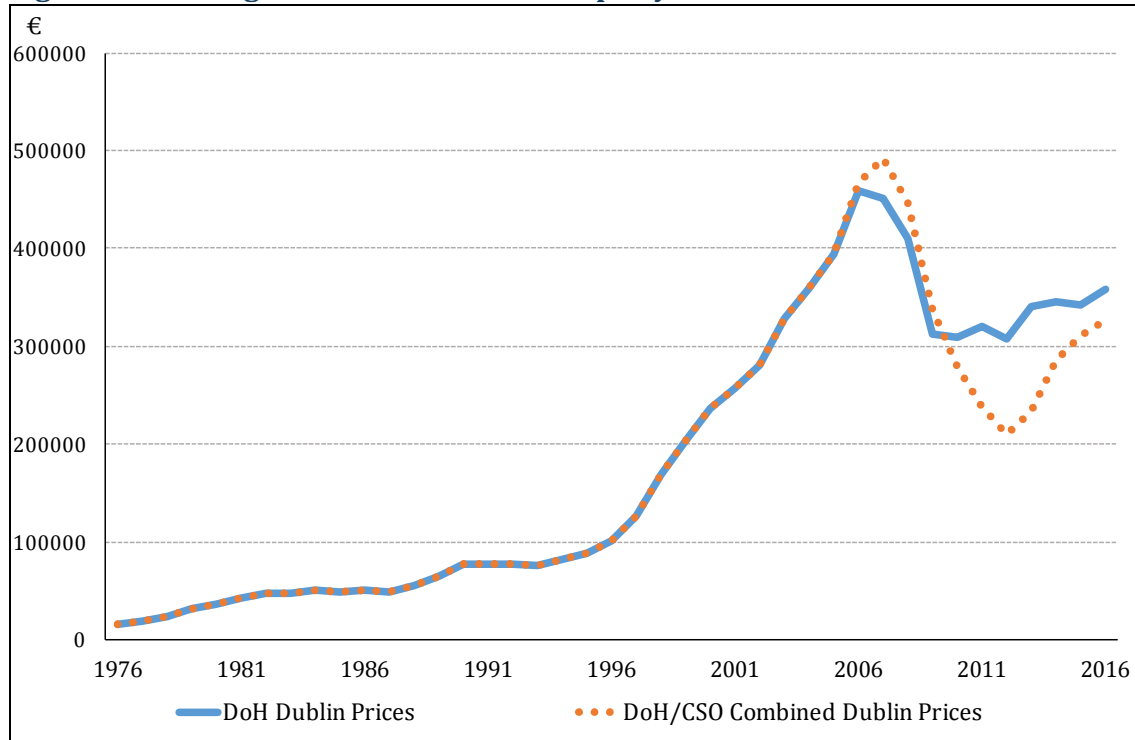
<sup>16</sup> Based on author's 'spliced' DoH/CSO price calculations outlined earlier

<sup>17</sup> Derived from data contained in CSO table 'EY001: Population at Each Census from 1841 to 2016 by County, Sex and Census Year'

<sup>18</sup> Please note that the DoH does not provide a breakdown of mortgages paid for new and second hand houses by region/city. Thus, it is assumed that the breakdown in Dublin follows the national trend for the purpose of creating a weighted Dublin house price level in the years 1987-2005

They stood at €357,642 in 2016.<sup>19</sup> For the purposes of estimating house price affordability, this research will use the ‘spliced’ estimate.

**Figure 11 : Average Dublin Residential Property Prices**



Source: Dept. of Housing, CSO, Author's own calculations

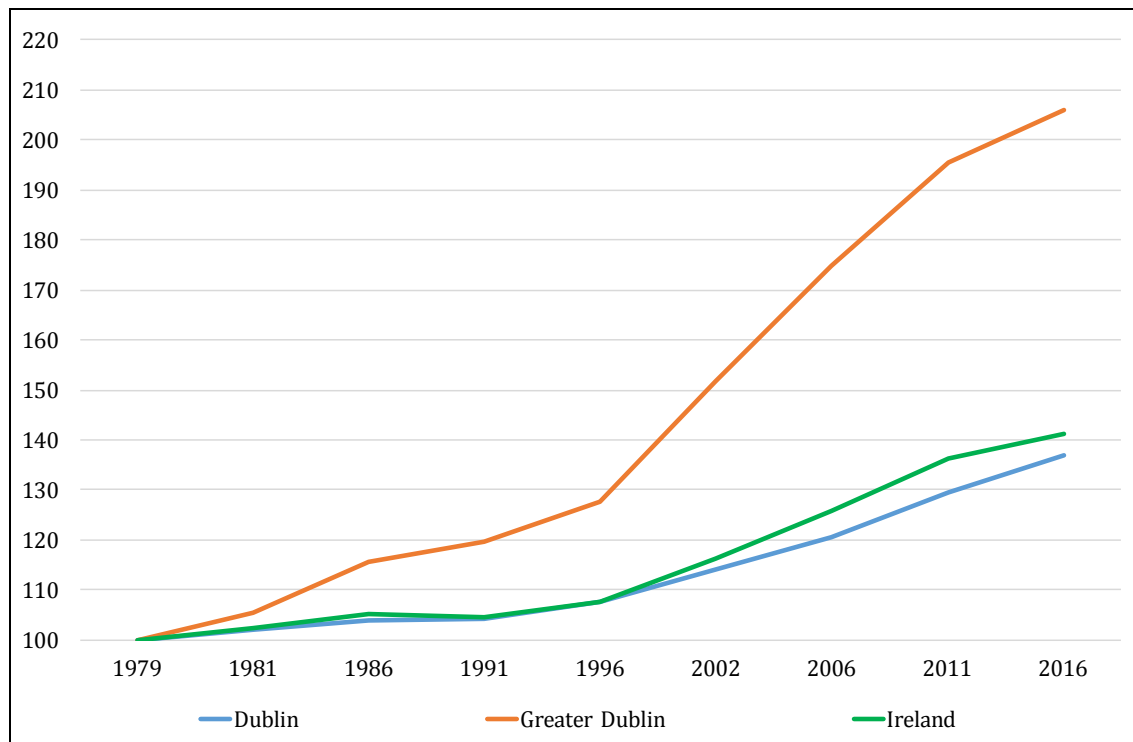
Notes: 2016 figure for DoH Prices is an estimate based on Q1-Q3 data

What explains the rise in Dublin house prices to levels above those seen at a national level? Well one possibility is that the county began to attract workers from other parts of the country (and abroad) to work in new sectors of the economy during the 90s. Dublin wages have also tended to be higher than elsewhere in the country,<sup>20</sup> providing more capital with which to purchase a property, driving up prices. Although, the higher wages are often not enough to compensate for the higher housing costs, having a negative impact on household formation rates in the Capital (*Byrne et al., 2014a*).

<sup>19</sup> Based on data for Q1-Q3

<sup>20</sup> See for example the CSO's 'Estimates of Household Income by County and Region' for evidence of this <http://www.cso.ie/px/pxeirestat/Staire/SelectVarVal/Define.asp?maintable=CIA01>

**Figure 12 : Changes in Population (1979 = 100)**



Source: CSO, Author's Calculations

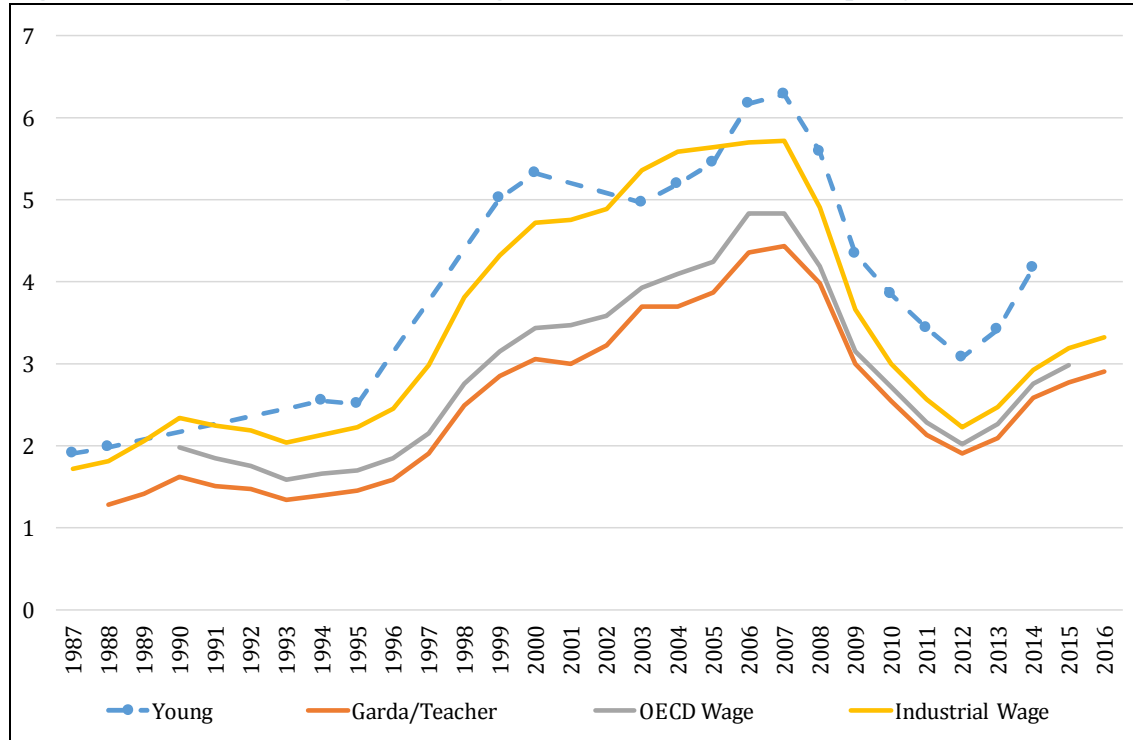
This idea is given further weight in the context of the changes in population seen in recent decades. Between 1979 and 2016 population growth in Dublin was actually lower than the national average. At the same time, the population in 'Greater Dublin' (Meath, Kildare and Wicklow) more than doubled. Growth has been particularly strong in this area since the mid-90s, matching the trend in the growth of Dublin house prices. This suggests that there is a large cohort of people working in or around Dublin, but who are unable to afford to live there, which has helped to keep both demand for and prices of Dublin residential properties relatively high.

#### **4.2 Price to Earnings**

In order to calculate price to earnings for the Dublin area, in the absence of Dublin specific income data for our four income groups, we provide a 10 per cent income 'top-up' to the observed national averages.<sup>21</sup> No top-up is provided to our public sector workers as their wage is determined by the Government and applied at a national level, indifferent to working location or differences in living expenses.

<sup>21</sup> This is line with the methodology of the *DKM/ESB (2016)*

**Figure 13 : Gross Earnings to Average Dublin Residential Property Price**

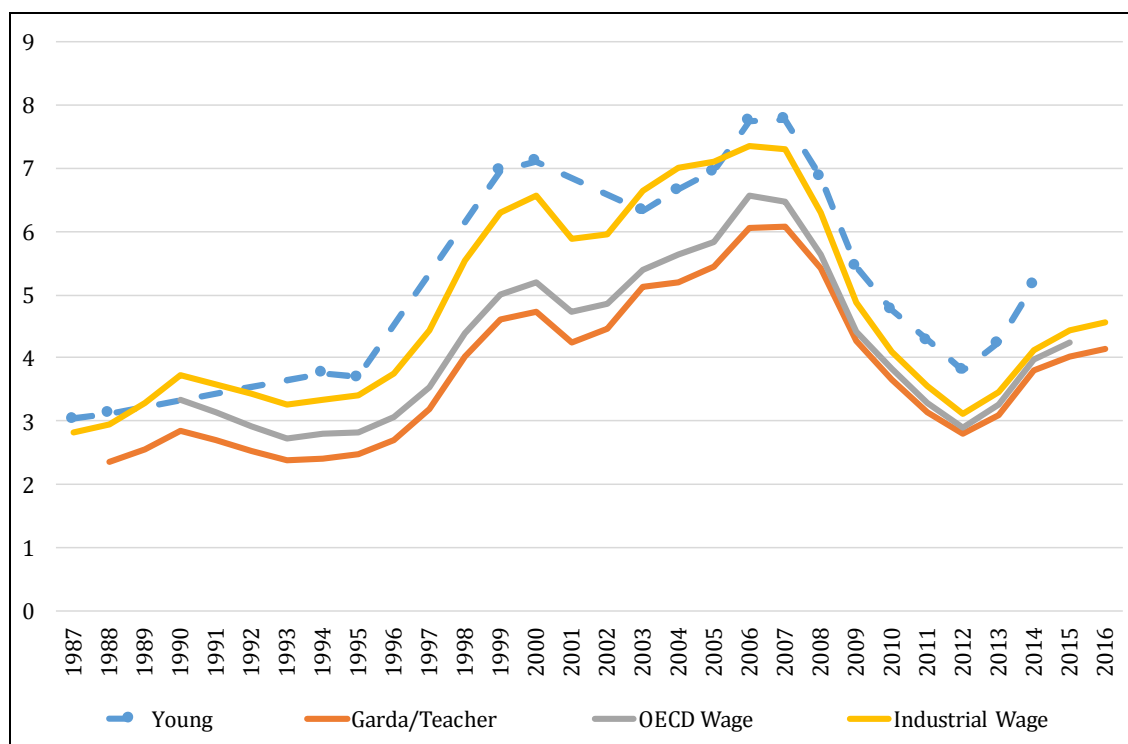


Source: CSO, OECD, Author's calculations

The ratio of gross income for a couple to the average Dublin property price peaked for all income groups in 2007, ranging from 4.4 times for our public sector proxy couple to 6.3 times for our young couple. With Dublin prices rebounding more strongly than the national average following the property crash, affordability ratios today remain elevated compared to the late 80s/early 90s period. Once again, the situation is particularly bad for the young couple, with an average house costing 4.2 times gross annual earnings in 2014, versus just 1.9 times in 1987.



**Figure 14 : Net Earnings to Average Dublin Residential Residential Property Price**



Source: CSO, OECD, Author's calculations

When looked at the ratio in terms of net earnings, we see that the peak was 2006/07 for all couples, ranging from 6.1 times to 7.8 times net annual earnings. The ratios for all income groups remain higher today than a generation ago, with a property in Dublin amounting to at least 4 times average earnings.

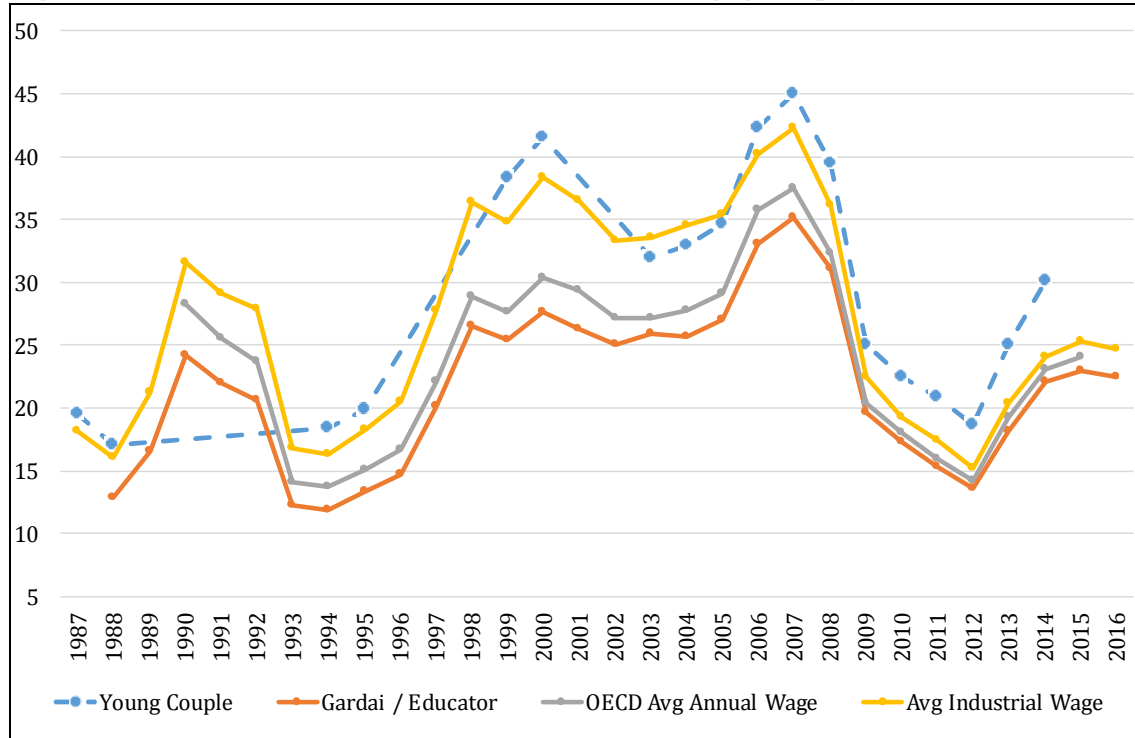
#### **4.3 Percentage of Net Annual Earnings Committed to Mortgage Repayments in Dublin**

Housing affordability was broadly in line with the national average in Dublin in the late 80s. This represents the relative closeness of prices in the Capital to the national average, as well as the presumption of slightly higher wages in Dublin versus elsewhere. A couple both on the average industrial wage in 1987 would have paid about 18 per cent of net annual earnings in mortgage repayments weather taking average national or average Dublin house prices.

A divergence in affordability emerged during the 90s, with the national average couple on the average industrial wage paying about 29 per cent of net earnings, versus 36 per cent in Dublin. By the peak in 2007, the discrepancy was 33 per cent versus 42 per cent. In 2016, the difference in the national average compared to Dublin was 20 per cent versus 27 per cent.

Our young couple hoping to live in Dublin would have to pay about 30 per cent of their net annual earnings to afford the average Dublin property in 2014, compared to just 19 per cent in 1987. This compares to the national average of 24 per cent in 2014 versus 20 per cent in 1987.

**Figure 15 : Net Income to Meet Dublin Annual Mortgage Repayment**



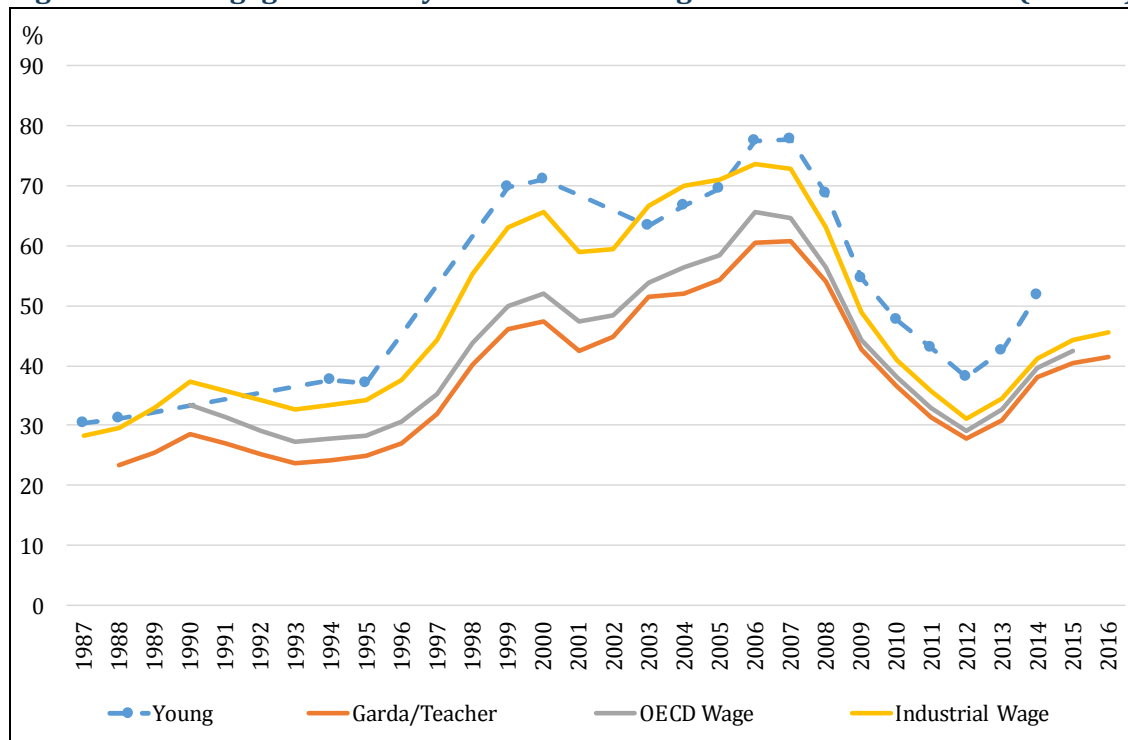
Source: CSO, OECD, Dept. of Finance, Author's Calculations

#### **4.4 Affordability of Housing Deposit in Dublin**

Being in a position to put up 10 per cent of the value of a property is also more of an issue in Dublin, compared to the situation nationally.

Our young couple would have had to save 30 per cent of net annual earnings to afford a down payment for a typical Dublin property in 1987 (31 per cent national average). This had risen to 70 per cent by 1999 (57 per cent), peaking at 78 per cent in 2007 (63 per cent). In 2014 a 10 per cent deposit equated to 52 per cent of net earnings, versus a national average of 41 per cent.

**Figure 16 : Mortgage Down Payment as Percentage of Net Annual Income (Dublin)**



Source: CSO, OECD, Dept. of Finance, Author's Calculations

Unfortunately, the CSO does not decompose its CPI indices by county or region. Thus, we are unable to estimate the percentage of earnings (minus average rent) required to afford a deposit for Dublin on a long-term basis, as we did at a national level in Section 3.4. However, using data for average Dublin rent prices from Daft.ie for the period 2006-2016 we can calculate that a 10 per cent deposit would have equated to 105 per cent of a young couple's net annual earnings in 2007. It remained elevated in 2014 at 72 per cent.

#### **4.5 Affordability in Dublin in the Context of CBI Regulations**

The methods of measuring housing affordability that we have presented thus far in Section 4 have pointed to housing being less affordable in Dublin today than a generation ago for all of our income groups, with the situation noticeably worse for a typical young couple. However, the CBI's aforementioned macroprudential rules have likely exacerbated the situation.

Indeed, the CBI has noted that average LTV and LTI ratios increased slightly following the introduction of the regulations, while the average earnings of FTBs have increased (*Kinghan et al., 2016*). This suggests that those on lower incomes are possibly being 'shut out' of the market by the regulations. Thus, it is important to take another look at Dublin affordability in the context of these controls.

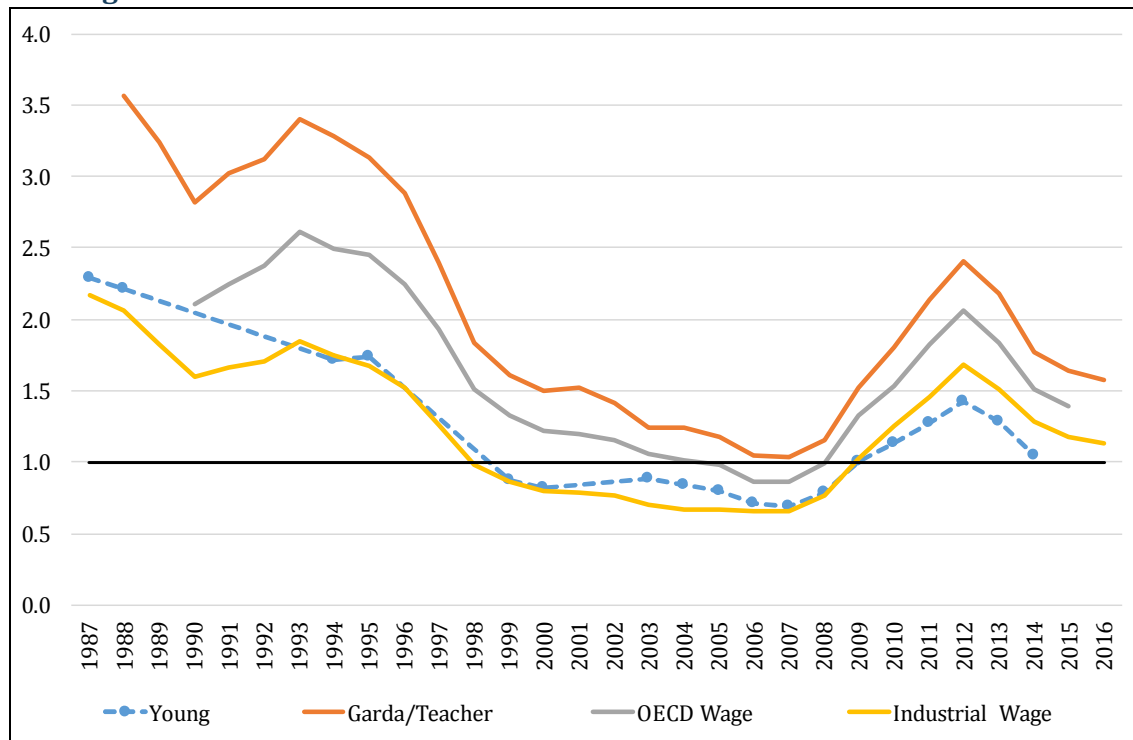
Current Central Bank lending rules state that mortgages must be:

1. Limited to an LTV of 90 per cent for First Time Buyers (FTB) and 80 per cent for Second and Subsequent Buyers (SSB)
2. Limited to 3.5 times gross earnings

Some exceptions to these rules apply for lenders (CBI, 2016), but we will ignore these for the purposes of the present research.

Duffy (2011) notes that in the period 1996-2010, the average house price for a FTB was approximately 85 per cent of the national average. This likely reflects a number of factors, including the potential smaller family unit size, meaning smaller houses, as well as lower levels of income. Thus, we will apply a 15 per cent 'haircut' to our estimate of the cost of a typical Dublin property. We will also assume income of Dublin FTBs to be in line with the national average, not applying the 10 per cent Dublin top-up. However, for our young FTB couple we will assume that wages are 5 per cent higher than the national average in Dublin.

**Figure 17: 90 Percent of Average Dublin FTB Property Price to 3.5 Times to Gross Earnings**



Source: CSO, OECD, Dept. of Finance, Author's Calculations

Between 1987 and 1997 the average earnings of our four couples would have been enough to borrow 90 per cent of the value of a FTB home in Dublin relatively comfortably. Earnings for both young people and those on the average industrial wage would not have been sufficient from the late 90s up until two years after the peak in 2009. Even the public sector couple would have had some difficulty around the height of the boom.

While we do not have estimates of earnings for the young couple in the years 2015 or 2016, the trend from the other income groups in this period suggests that the average young couple's earnings (including a 5 per cent 'top-up') are not sufficient to borrow the requisite amount to purchase an average FTB home in Dublin. This means that the shortfall must be made up through saving to afford a larger than 10 per cent deposit. Indeed, there is already evidence that the down payment to property value ratio for FTBs has fallen outside of Dublin in recent years, while it is rising in the Capital (*Kelly and Lydon, 2017*). As pointed out in section 4.4, a 10 per cent deposit already amounts to at least 72 per cent of a young couple's after rent net annual income in Dublin.

## **5. CONCLUSIONS**

This research paper set out to monitor the changes in housing affordability over a roughly 30-year period. The analysis showed that there was a marked worsening in affordability during the decade in the lead up to the crash in the property market in 2007, before the sharp correction in prices saw it improve again.

However, a strong pace of economic recovery in recent years, including a solid rebound in house prices in many areas, combined with higher taxes and the removal of MIR has put pressure on affordability once again, with the worsening situation being particularly pronounced in Dublin.

The economic downturn also appears to have hit younger people particularly hard, with their earnings declining more than the national average. This has left them finding it more difficult to get on the property ladder today than was the case for their parents' generation.

Official data sources suggest that the problems around being able to access housing which first emerged during the boom years, and which have re-emerged in recent years, may be having a marked impact on the lives of young people in Ireland. They are more likely to rent accommodation and they are getting married and forming family units at a later age.

Overall, while national affordability for many Irish people today is not significantly different from a generation ago, the recent trend and underlying housing market dynamics suggest that if the status quo is allowed to persist, then the problems with affordability being experienced by some sections of the population will begin to be felt more widely.

As discussed in Section 3.4, one of the weaknesses of this research is that it is unable to take a broader view of housing affordability, fitting it into a larger analysis of the cost of living. Further analysis of this issue is needed and it is my hope that this research would help to inform that larger project.

## REFERENCES

- Aksoy, C.G. (2016), '*Short-term effects of house prices on birth rates*', EBRD Working Paper, No. 192, London: European Bank for Reconstruction and Development
- Browne, F., T. Conefrey and G. Kennedy (2013), '*Understanding Irish house price movements – a user cost of capital approach*', CBI Research Technical Paper, Dublin: Central Bank of Ireland
- Blackwell, J. (1988) '*A Review of Housing Policy*', Dublin: National Economic and Social Council.
- Byrne, D., D. Duffy and J. FitzGerald (2014a), '*Household Formation and Tenure Choice*', ESRI Research Note, Dublin: Economic and Social Research Institute
- Byrne, D., D. Duffy and J. FitzGerald (2014b), '*Household Formation and Tenure Choice: Did the great Irish housing bust alter consumer behaviour*', ESRI Working Paper (No. 487), Dublin: Economic and Social Research Institute
- CBI (2016), '*Review of residential mortgage lending requirements*', Dublin: Central Bank of Ireland
- Connor, K. and F. McCann (2016) '*Rental markets, savings and the accumulation of mortgage deposits*', in Central Bank of Ireland Quarterly Bulletin, No. 4, pp.56-70, Dublin: Central Bank of Ireland
- CSO (2007) '*Household Budget Survey 2004-2005 – Final Results*', Dublin: Stationary Office
- CSO (2012) '*Household Budget Survey 2009-2010 – Volume 2*', Dublin: Stationary Office
- CSO (2017) '*Historical Earnings 1938 – 2015*', CSO Online Publication, accessed on 05/05/2017 at <http://www.cso.ie/en/releasesandpublications/ep/p-hes/hes2015/>
- Davy Private Clients (2014), '*Housing: The Past, The Present, The Future*', Davy Investing Insights Series, Dublin: Davy Group
- Department of Finance (various issues), '*Budget*', Dublin: Stationery Office.
- DKM/ESB (2016), '*EBS DKM Irish Housing Affordability Index – November 2016*', Dublin: DKM Economic Consultants
- Duffy, D. (2004), '*A Note on Measuring the Affordability of Homeownership*', in ESRI Quarterly Economic Commentary – Summer 2004, Dublin: Economic and Social Research Institute
- Duffy, D., J. FitzGerald and I. Kearney (2005), '*Rising House Prices in an Open Labour Market*', The Economic and Social Review, Vol. 36, Issue 3, pp.251-272

- Duffy, D. (2011), '*User Cost and Irish House Prices*', in ESRI Quarterly Economic Commentary – Autumn 2011, Dublin: Economic and Social Research Institute
- Duffy, D., D. Foley, N. McInerney and K. McQuinn (2016), '*Demographic Change, Long-Run Housing Demand and the Related Challenges for the Irish Banking Sector*', in Ireland's Economic Outlook: Perspectives and Policy Challenges, Dublin: Economic and Social Research Institute
- Engelhardt, G.V. (1994), '*House Prices and the Decision to Save for Down Payments*', Journal of Urban Economics, Vol. 36, Issue 2, pp.209-237
- Fahey, T. (2004) '*Housing Affordability: Is the real problem in the private rented sector?*', in ESRI Quarterly Economic Commentary – Summer 2004, Dublin: Economic and Social Research Institute
- Gerlach-Kristen, P. (2013) '*Younger and older households in the crisis*', in ESRI Quarterly Economic Commentary – Spring 2013, Dublin: Economic and Social Research Institute
- Haurin, D.R. (2016), '*The Affordability of Owner-Occupied Housing in the United States: Economic Perspectives*', Special Report, Washington: The Research Institute for Housing America
- IMF (2017), '*2016 Sixth Post-Programme Monitoring Discussions – Press Release; and Staff Report for Ireland*', Washington: International Monetary Fund
- Indecon (2016), '*A Study to Examine the Affordability of Irish Housing*', Indecon Consultants on behalf of the National Competitiveness Council, Dublin: Indecon
- ISI (2016), '*Guidelines on a reasonable standard of living and reasonable living expenses*', Dublin: Insolvency Service of Ireland
- Kelly, J. and Lydon, R. (2017) '*Home purchases, downpayments and savings*', Economic Letters Series, Vol. 2017, No. 2, Dublin: Central Bank of Ireland
- Kennedy, G. and Stuart, R. (2016) '*Housing supply after the crisis*', Economic Letters Series, Vol. 2016, No. 12, Dublin: Central Bank of Ireland
- Kinghan, C., Y. McCarthey and C. O'Toole (2016) '*The Effects of Macroprudential Policy on Borrower Leverage*', Economic Letters Series, Vol. 2016, No. 8, Dublin: Central Bank of Ireland
- Lauster, N.T. (2006), '*A Room of One's Own or Room Enough for Two? Access to Housing and New Household Formation in Sweden, 1968-1992*', Population Research and Policy Review, Vol. 25, No. 4, pp. 329-351
- Li, J. (2014) '*Recent trends on housing affordability research: where are we up to?*', CityU Working Paper Series, Working Paper No.5/2014, Hong Kong: City University of Hong Kong



Lozej, M. and A. Rannenberg (2017), '*The macroeconomic effects of the regulatory LTV and LTI ratios in the Central Bank of Ireland's DSGE model*', Economic Letters Series, Vol. 2017, No. 4, Dublin: Central Bank of Ireland

Lydon, R. and F. McCann (2012), '*The income distribution and the the Irish mortgage market*', Economic Letters Series, Vol. 2012, No. 5, Dublin: Central Bank of Ireland

Lyons, R. (2014), '*The spread of rents in Ireland, over time and space*', in *Renting in Ireland: The Social, Voluntary and Private Sectors*, Dublin: Institute of Public Administration

Mayer, C.J. and G.V. Engelhardt (1996), '*Gifts, Down Payments and Housing Affordability*', *Journal of Housing Research*, Vol. 7, Issue 1, Fannie Mae Foundation

McCann, F. (2016) '*Exploring developments in Ireland's regional rental markets*', Economic Letters Series, Vol. 2016, No. 13, Dublin: Central Bank of Ireland

McCarthy, Y. and K. McQuinn (2013) '*Credit conditions in a boom and bust property market*', Research Technical Papers, 08/RT/13, Dublin: Central Bank of Ireland

McKee, K. (2012), '*Young People, Homeownership and Future Welfare*', *Journal of Housing Studies*, Vol. 26, Issue 6

McQuinn, K., D. Foley and E. Kelly (2017), '*Quarterly Economic Commentary – Spring 2017*', Dublin: Economic and Social Research Institute

McQuinn, K and G. O'Reilly (2006) '*Assessing the Role of Income and Interest Rates in Determining Irish House Prices*', Research Technical Paper, 15/RT/06, Dublin: Central Bank of Ireland

NESC (2014), '*Homeownership and Rental: What Road is Ireland On?*', Dublin: National Economic & Social Council

Norris, M. and D. Coates (2014), '*How Housing Killed the Celtic Tiger: Anatomy, Consequences and Lessons of Ireland's Housing Boom and Bust, 2002-2009*', *Journal of Housing and the Built Environment*, Vol. 29, Issue 2, pp.299-315

Norris, M. and Winston, N. (2013), '*Young People's Trajectories through Irish Housing Booms and Busts: headship, housing and labour market access among the under 30s since the late 1960s*', pp. 199-216 in R. Forrest and Ngai-Ming, Y. (Eds) *Young People and Housing: Transitions, Trajectories and Generational Fractures*. Oxon: Routledge

OECD (2017), "Average annual wages", *OECD Employment and Labour Market Statistics* (database). Accessed on 07/05/2017 at [http://stats.oecd.org/viewhtml.aspx?datasetcode=AV\\_AN\\_WAGE&lang=en#](http://stats.oecd.org/viewhtml.aspx?datasetcode=AV_AN_WAGE&lang=en#)

O'Hanlon, N. (2011), '*Constructing a National House Price Index for Ireland*', *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. 40

ONS (2016), 'Why are more young people living with their parents', Office for National Statistics Digital Article, 22 February 2016, accessed at <http://visual.ons.gov.uk/living-with-parents/> on 21 April 2016

Quigley, J.M. and S. Raphael (2004), '*Is Housing Unaffordable? Why Isn't It More Affordable?*', Journal of Economic Perspectives, Vol. 18, Issue 1, pp.191-214

Revenue Commissioners (Various Years), '*Statistical Report of the Revenue Commissioners*', Dublin: Stationary Office

Talha Yalta, A. (2016), '*Down payment saving in the United States: Evidence from the Panel Study of Income Dynamics*', Real Estate Economics, Vol. 44, Issue 2, pp.355-377

Turffrey, B. (2010), 'The Human Cost: How the lack of affordable housing impacts on all aspects of life', London: Shelter

White, S. (2016), '*Impact of the Shortage of Housing on Young People*', House of Lords Library Note, London: House of Lords Library

## APPENDIX A. REVIEW OF INCOME MEASURES

### *Estimating Youth Earnings*

This paper used a data series which estimated the earnings of a typical young couple (both aged 25-34). This series was constructed using data from the Household Budget Survey for the years 1987/88, 1994/95, 1999/00, 2004/05 and 2009/10. *Ad hoc* calculations of a typical working couple (one male, one female) using the National Employment Survey were provided by the CSO for the years 2003 and 2006-2009. Similarly, the CSO provided estimates for the years 2011-2014 using its Earnings Analysis using Administrative Data Sources dataset.

Given that the data for the young couple come from a number of different datasets, the figures are not directly comparable on a year-to-year or period-to-period basis. Therefore, it is the author's view that they are to be viewed as mere 'estimates' of youth earnings in the stated years, rather than one coherent time-series.

**Table 3: Estimates of Youth Weekly Direct Household Income (from HBS)**

	Number of Young Working Couple Households in Sample	Period Covered in Survey	Mean Household Weekly Direct Income in Euro
1987	276	Full Year	<b>543.98</b>
1988	56	Q1-Q2	<b>578.92</b>
1994	180	Full Year	<b>674.94</b>
1995	139	Q1-Q3	<b>729.45</b>
1999	166	Full Year	<b>845.18</b>
2000	164	Q1-Q3	<b>925.28</b>
2004	43	Q3	<b>1383.72</b>
2005	287	Full Year	<b>1508.64</b>
2009	127	Q3-Q4	<b>1579.54</b>
2010	260	Q1-Q3	<b>1513.46</b>

Table 3 outlines the calculation for 'Mean Household Weekly Direct Income' for households where both adults are working and aged between 25 and 34. However, direct income includes a number of sources of income other than wages and salaries, such as money contributed to pensions by employers and investment income. Both *CSO (2007)* and *CSO (2012)* suggest that these other incomes account to approximately 12% of direct weekly household income. Thus, we take mean weekly earnings to be 88% of the direct figure.

One issue with using the HBS as a source for estimating average earnings is that it will be sensitive to the 'class'/socio-economic status of typical heads of households. Meaning that if household heads are not representative of the overall young workforce, then our estimate will likely over or under estimate average earnings.

Given that lower income workers may have difficulties in affording to form an independent household, the earnings of the young couple in the HBS sample seem likely to be higher than the actual national average. Thus, an additional 5% reduction is applied to our HBS estimates. This seems appropriate when the estimates are 'sense checked' against the *ad hoc* CSO data provided for use in this research.

Table 4 outlines the estimated average weekly gross earnings of a young couple based on our three different data sources. Annual gross earnings figures are annualised in the research assuming that there are 52.14 weeks in a year.

**Table 4: Estimates of Average Weekly Young Couple Earnings by Data Source**

Year	HBS	NES	EAADS
1987	€454.77		
1988 <sup>(i)</sup>	€487.13		
1994	€564.25		
1995	€609.82		
1999	€706.57		
2000	€773.53		
2003		€1156.37	
2004 <sup>(ii)</sup>	€1208.80		
2005	€1261.22		
2006		€1318.97	
2007		€1365.07	
2008		€1395.33	
2009 <sup>(i)</sup>	€1320.50	€1356.19	
2010	€1265.25		
2011			€1207.54
2012			€1191.55
2013			€1189.07
2014			€1194.52

(i) 1% 'top-up' applied to account for only half year of data

(ii) 2004 HBS figure was deemed unsuitable given small sample size and only one quarter of data. 2004 figure represents authors estimate based on available information

### ***Estimating Average Industrial Earnings***

Constructing a long term series of average industrial earnings in Ireland is no easy thing to do. This is because, as with the youth earnings, no single data series to work with. Thus, a long term series must be constructed by splicing together various data sets.

For the purposes of this research we use the following CSO series for estimating a long-term level of average industrial earnings.

Q1 1987 – Q2 1996

- *EHQ51: Average Earnings and Hours Worked by Type of Employee, Sex, Broad Industrial Sector NACE 70, Quarter and Statistic*

Q3 1996 – Q3 2005

- *QIJQ1: Tables 5 and 6: Average Earnings and Hours Worked by Sex, Industry Sector and Quarter*

Q4 2005 – Q4 2007

- *EHQ11: Indices of Average Earnings and Hours Worked excluding Irregular Earnings by Economic Sector NACE Rev 2, Quarter and Statistic*

Q1 2008 – Q4 2016

- *EHQ03: Average Earnings, Hours Worked, Employment and Labour Costs by Economic Sector NACE Rev 2, Type of Employee, Quarter and Statistic*

The methodological differences between these series means that, in the words of the CSO, “[c]aution is advised when interpreting this data” (CSO, 2017).

### **Estimating the Public Sector Proxy Earnings**

For the purposes of this survey we take a typical member of An Garda Síochána and a typical public sector ‘educator’.

For the years 1988 – 2008 the salaries as defined as:

‘An Garda Síochána’ (includes overtime) and ‘Education’ found in

- *PSA01: Public Sector Average Weekly Earnings (1988 to 2008) by Type of Public Sector Employment and Year*

For the Q1 2009 – Q4 2016 the salaries are defined as:

‘Garda Siochana’ and ‘Education’ found in

- *EHQ10: Public Sector Employment and Earnings by Sub Sector, Quarter and Statistic*

### ***The OECD Measure of Average Annual Wages***

This comes from *OECD (2017)*. The OECD only provides estimates for the years 1990-2015 as of 07/05/2015. This research uses wages in current prices expressed in euro.

Average wages per the OECD’s estimates denote average annual wages per full-time equivalent. This is calculated by dividing the national accounts wage bill by the average number of employees. This, in turn, is multiplied by the ratio of average normal hours per full time employee to average usual hours of all employees.

It must be noted that given its methodology, the OECD tends to overestimate the level of average earnings in Ireland, at least using the CSO’s estimate as benchmark.

For example, the OECD measure estimated average annual earnings in Ireland in 2015 of €47,366 (*OECD, 2017*), while the CSO estimated that the average annual earnings of an average full-time worker was €45,075, or €41,484 when irregular and other such earnings are excluded.<sup>22</sup>

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<sup>22</sup> See CSO Table ‘*EHA05: Average Annual Earnings and Other Labour Costs by Type of Employment, NACE Rev 2 Economic Sector, Year and Statistic*’



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