

WEALTH EFFECTS, LOCAL AREA ATTRIBUTES, AND ECONOMIC PROSPECTS: ON THE RELATIONSHIP BETWEEN HOUSE PRICES AND MENTAL WELLBEING

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This research exploits large variations in local house prices to investigate whether house prices correlate with mental wellbeing, and uses contrasting implications for the effect of house prices on the mental wellbeing of homeowners and renters to shed light on why this correlation might arise. I document a positive correlation between house prices and the mental wellbeing of both homeowners and non-homeowners, which is inconsistent with a pure wealth effect. Instead this finding suggests that local house prices provide a reflection of available amenities and economic opportunities in the area.

JEL Codes: D12, I0

Keywords: house prices, mental wellbeing, wealth

1. INTRODUCTION

The ups and downs of U.K. house prices attract considerable media attention. In recent years, the average house price has fluctuated between £85,000 in 1991, £68,000 in 1995, and £172,000 in 2007,¹ fuelled by changing demographics and incomes in combination with restrictive planning policies (Nickell, 2009). Moreover, as Figure 1 illustrates, there exists considerable spatial variation in house prices across British regions, and across postcode areas (i.e., cities and clusters of towns) located within those regions. At the regional level, house prices increased from 1995 in Greater London and the South East but remained relatively flat in the West Midlands and the North of England until 2000. An inspection of local area house prices reveals further differences in the evolution of local house prices within each region. For example, much larger increases in house prices are observed in the South Western postcode area spanning Central London compared to postcode areas in Outer London.

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¹Source: Halifax House Prices. All monetary values in this paper are adjusted for inflation using the retail price index excluding mortgage interest payments (RPIY) using the year 2000 as the base year.

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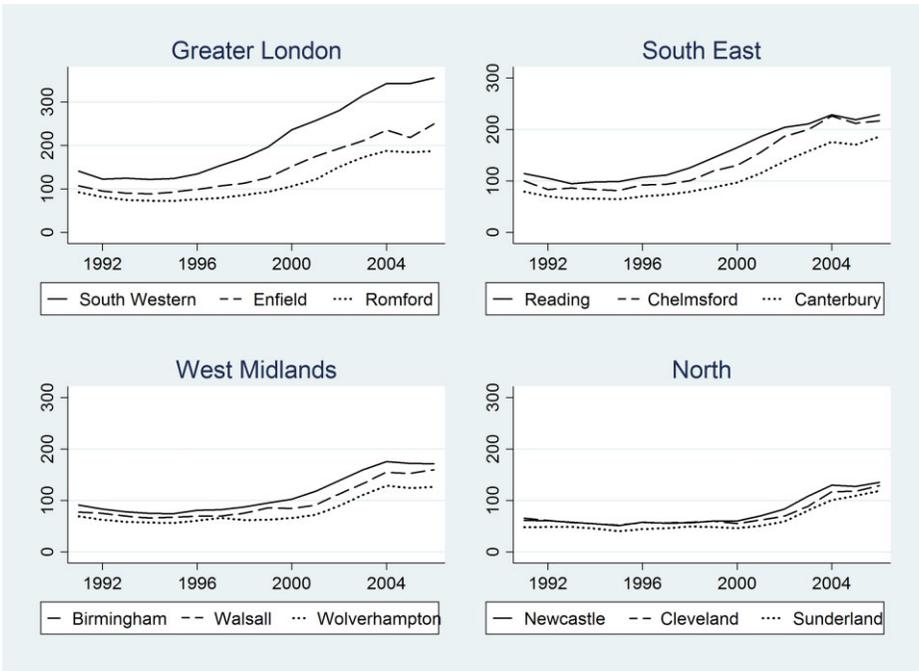


Figure 1. Postcode Area House Prices in Selected Regions (£1000's)

Source: Halifax House Prices, deflated to 2000 prices.

This research exploits large variations in local house prices to investigate whether house prices influence subjective wellbeing, as measured via mental health. A number of reasons suggest this might be the case. For example, fluctuations in house prices of this magnitude may have a significant impact on household wealth, particularly in the U.K. where housing dominates wealth portfolios (Banks *et al.*, 2004). If the processes underlying house price fluctuations have little bearing on wellbeing (i.e., where demographic changes drive house prices), a pure wealth mechanism may emerge whereby unexpected increases in house prices solely generate wealth shocks. Under this scenario, homeowners are made wealthier, and feel better, with the opposite expected for renters now facing higher purchase and rental prices.

Where the drivers of house prices potentially influence wellbeing (i.e., house price capitalization of desirable area characteristics), house prices might provide a reflection of the benefits derived from living in better areas in addition to possible wealth shocks. Exposure to better neighborhood conditions points toward a positive correlation between house prices and wellbeing irrespective of tenure status, and could lead to a positive correlation overall for renters if living in better areas outweighs any negative wealth shocks.

Finally, observed correlations may not capture causal relationships but reflect issues of selection and reverse causality. For example, happier people may gravitate toward particular areas and have a greater capacity to generate wealth (and housing demand), or feeling good may itself influence decision-making.

This paper makes the following contributions to the literature. It is the first to analyze the potential effects of local house prices on mental wellbeing using panel data, by taking advantage of restricted-access geographic identifiers to match postcode area house price data to respondents in the British Household Panel Survey (BHPS). To shed light on why house prices matter, I exploit contrasting implications for the effect of house prices on the mental wellbeing of homeowners and non-homeowners across alternative explanations, and also introduce proxies of area quality in the analysis. To date very little is known on this topic.

To preview the results, I present evidence of a positive correlation between house prices and the mental wellbeing of homeowners and non-homeowners, which is inconsistent with a pure wealth effect. This correlation remains after controlling for individual income and employment status, which may be changing at the same time as house prices. In further analysis, I present suggestive evidence that fluctuations in house prices provide a reflection of available amenities and economic opportunities in the area.

This paper is structured as follows: Section 2 outlines possible links between house prices and mental wellbeing, Section 3 discusses the empirical methodology, Section 4 presents the empirical evidence, while Sections 5 and 6 provide a discussion and conclusion.

2. HOUSE PRICES AND MENTAL WELLBEING

2.1. *A Pure Wealth Mechanism*

A pure wealth mechanism emerges if rapid increases in house prices are both unexpected and driven by factors not directly influencing wellbeing (i.e., demographic changes). If these conditions are satisfied, differences in local area house price dynamics may be exploited as producing wealth shocks of varying magnitude, in much the same way that lottery winnings are used to investigate the effect of economic resources on wellbeing (Gardner and Oswald, 2007). An advantage of using house prices for this purpose is that the scale of house price fluctuations provides greater variation in wealth than previously studied and affects the majority of households.

It is often argued, however, that increases in house prices are irrelevant to homeowners without plans to alter future housing consumption (King, 1990). Nevertheless, homeowners may still use increases in net worth to offset precautionary savings (Skinner, 1996) or to obtain better access to, and better terms of, credit (Aoki *et al.*, 2004; Iacoviello, 2004).

Renters are arguably made worse off when house prices unexpectedly rise given that buying and renting property becomes more expensive. For example, in England the correlation between the house price index and private sector rental index is 0.96.² We might therefore expect the mental wellbeing of renters to deteriorate, and thus move in the opposite direction to homeowners, when house prices rise.

²Source: Halifax House Prices, Survey of English Housing.

Luttmer (2005) considers the possibility that housing wealth influences well-being based on homeowner-supplied property valuations, and presents evidence that homeowners with expensive properties are happier. Pudney (2011) further presents evidence that perceptions of financial wellbeing both correlate with housing equity, and over-reacts to changes in housing equity, suggesting a greater-than-warranted influence of house prices on homeowner wellbeing. In a related study, Gathergood (2012) shows that increases in county-level house prices alleviates mental distress among homeowners in arrears, with no equivalent effect found among renters in the same position or among non-financially distressed households. This finding suggests that debt-burdened homeowners may use increases in net worth to improve their finances (i.e., by re-mortgaging) and ultimately their wellbeing.

2.2. *A Reflection of Area Amenities and Economic Opportunities*

House prices reflect area quality, with better areas commanding higher prices (see Ross and Yinger, 1999, for a review). A priori, however, it is not clear that house prices would correlate with mental wellbeing if house prices capture the valuation placed on local public goods and services, private enterprises, and economic opportunities accessed by living at a particular address. When people can move freely, each person will maximize wellbeing by moving to whatever area best satisfies their preferences for area quality and income net of housing costs. The optimal choice for some will be many desirable area features at a high (house) price, and few desirable features at a low price for others, resulting in zero correlation between area characteristics (or house prices) and wellbeing.

However, in the presence of imperfect information, institutional restrictions, and switching costs (both financial and psychological), people may be constrained in their choices/mobility, resulting in a mismatch between area quality and house prices. If people think they are paying too much for poor quality or too little for high quality, we would observe a positive relationship between area characteristics and wellbeing. Mismatches along these lines are more likely to be observed with panel data. Inertia in housing markets suggests that area improvements may attract less than proportionate increases in house prices, with deteriorations attracting less than proportionate declines. Under these circumstances, variations in local house prices would provide a crude indicator of the desirability of living in a particular area while satisfying the condition for observing a positive correlation between area characteristics (and thus house prices) and wellbeing.

In general, if increases in house prices reflect improvements in public goods and services, private enterprises, and economic opportunities, we might expect a positive correlation between house prices and the mental wellbeing of homeowners and renters since both groups benefit from exposure to better circumstances (specific pathways are discussed in Sections 2.2.1 and 2.2.2). In addition, unexpected increases in house prices generate wealth shocks. The overall effect of house prices on mental wellbeing therefore combines both these potential effects. For homeowners both effects operate in the same direction while these effects are opposing for renters. If the benefits of living in better areas outweigh wealth shocks, the

overall effect of house prices could be positive for both groups, and potentially larger for homeowners.

2.2.1. Area Amenities

The availability of better facilities makes day-to-day living more enjoyable, which raises the possibility of a positive correlation between house prices and wellbeing. Empirical evidence supports the relevance of area amenities in shaping levels of wellbeing. For example, better neighborhood aesthetics are associated with higher wellbeing (Dolan and Metcalfe, 2008) and community satisfaction (Florida *et al.*, 2011), with proximity to green spaces and sports facilities also valued (Knies *et al.*, 2008). Conversely, higher neighborhood deprivation reduces wellbeing (Shields and Wheatley Price, 2005), while moving away from deprived localities has long-term wellbeing benefits (Ludwig *et al.*, 2012). The evidence on whether public services (measured via government expenditure) affect wellbeing is more mixed, with studies exploiting variation in local government expenditures finding a positive, if any, effect of public expenditures on wellbeing (Wassmer *et al.*, 2009; Kotacorpi and Laamanen, 2010). However, Clark *et al.* (2009) find evidence that people are happier when living among richer neighbors, and this finding is not easily explained by richer neighbors expanding the local tax base. Instead, more affluent neighbors may foster community-level social capital, creating better physical, social, and safer environments to live in.

2.2.2. Economic Opportunities

The availability of better economic opportunities shapes income expectations, which are likely to matter to wellbeing for two reasons. First, revisions to income expectations following income shocks drive consumption and leisure decisions. This raises the possibility of a positive correlation between house prices and mental wellbeing through underlying changes in consumption and labor supply. Second, any signals concerning future prosperity might alleviate economic uncertainty, which research shows is detrimental to wellbeing. For instance, Pudney (2011) finds evidence that subjective evaluations of financial wellbeing over-react to events such as job loss or long-term ill health, with larger-than-warranted declines in financial wellbeing observed in the year that people suffer these events. Several authors also document a negative association between increased risk of job loss, as measured via unemployment rates in national or local labor markets, and wellbeing (see, for example, Di Tella *et al.*, 2001, 2003; Charles and DeCicca, 2008).

Of course, house prices move in tandem with unemployment rates and earnings, and any correlation between house prices and wellbeing may simply reflect economic variables omitted from the empirical specification. Alternatively, a strong performance in the housing market may foster a “feel good” factor as a distinct barometer of economic prospects if house prices capture a separate dimension of the economic outlook. Since the housing market aggregates the beliefs of many forward-looking individuals making long-term investments, house prices may relay signals of long-term prospects. A recent related study by Deaton (2012) presents evidence that share prices and satisfaction with living standards move

together in the U.S., even among groups unlikely to own shares. The evolution of share prices also better accounts for the evolution in satisfaction levels than unemployment rates, indicating that asset prices may convey unique signals.

Finally, it is often argued that house prices are a good proxy of the local price level (Blanchflower and Oswald, 2004; Luttmer, 2005; Kotacorpi and Laamanen, 2010). As higher house prices therefore indicate lower real wages, this mechanism suggests a negative rather than positive correlation between house prices and mental wellbeing although this conjecture receives little support empirically.

2.3. Selection and Reverse Causality

While a correlation between house prices and wellbeing may reflect pathways from the former to the latter, there are also reasons to be cautious about such an interpretation. For example, happier people are better at generating wealth (Lyubomirsky *et al.*, 2005), and wealthier people can afford to move to, and within, expensive areas. Any increase in house prices might therefore reflect happier and economically successful residents driving housing demand in a particular area. Happiness may also be determinant of decision-making irrespective of economic resources.

3. EMPIRICAL STRATEGY

3.1. Methodology

This paper analyzes whether and why a relationship between house prices and mental wellbeing exists. A pure wealth mechanism suggests homeowners are likely to feel better, and renters feel worse, when house prices rise. Other mechanisms point toward entirely positive or negative correlations between house prices and wellbeing irrespective of tenure status. Accordingly, I estimate the following equation:

$$(1) \quad Y_{ijt} = \sum_{g=1}^G \alpha_g \ln(\text{house price}_{jt}) \cdot I\{\text{tenure status}_{it} = g\} + \sum_{g=2}^G \psi_g \cdot I\{\text{tenure status}_{it} = g\} + \beta' z_{ijt} + \delta_t + \eta_{ij} + v_{ijt}$$

where Y_{ijt} is a measure of mental wellbeing for individual i , in area j , at time t . $\ln(\text{house price}_{jt})$ measures the log of the average house price faced by residents in that area and time period, which is interacted with tenure status to allow the effect of house prices to differ across homeowners and non-homeowners. Taking the log of house prices allows for diminishing marginal effects of house prices at higher price levels, which is consistent with diminishing marginal utility of housing wealth, or amenities. In the literature on economic uncertainty and wellbeing, however, taking logs of variables (i.e., employment rates) implies diminishing marginal disutility of increasing economic uncertainty and is avoided. Nevertheless, the log of house prices implies larger utility gains from decreasing high levels of uncertainty, with smaller gains at lower levels, which seems to be a reasonable assumption.

Four tenure groups are identified: homeowners who own their property outright (outright homeowners), homeowners making mortgage repayments (mortgaged homeowners), renters renting in the private market (private renters), and renters renting from local authorities or charitable trusts (social renters). A priori, there are reasons to expect any wealth effects to differ across outright and mortgaged homeowners. For example, outright homeowners are older and more likely to downsize in future. Conversely, mortgaged homeowners include first time buyers who are more likely to increase their housing consumption in future, and may react differently if unexpected gains to larger properties outstrip those to smaller properties.

There are also reasons to expect wealth effects to differ across renters. For example, tenants in social housing are typically poorer and less likely to purchase property in future (Monk *et al.*, 2006), suggesting a pure wealth mechanism may be less of a consideration for these renters. Moreover, there are reasons to expect the costs of accessing better areas to differ across renters. For example, rents in the social rented sector are shielded from market forces (Wilson, 2013) suggesting social renters may benefit from improvements to area quality without paying the higher rents that better localities attract. However, nearly half of all social housing is located in the most deprived neighborhoods (Hills, 2007), and pockets of deprivation may persist despite general area improvements.

Differences in socio-economic and demographic characteristics are taken into account through the vector z_{ijt} . Initially the analysis controls for variables unlikely to be directly affected by house prices, or economic conditions more generally. This restricts the set of control variables to a series of dummy variables for age, marital status, and household composition. Intermediate variables such as income and labor market outcomes might soak up any correlation between house prices and mental wellbeing and are therefore added later.

General influences on wellbeing that change over time, such as macroeconomic shocks, are captured via year dummies δ_t , while individual interacted with area fixed effects, η_{ijt} , flexibly allow for general differences in mental health across individuals to vary following relocation to another area. Hence, the effect of house prices is identified from correlating changes in house prices that occur during the time a person resides in a particular area with changes in their mental wellbeing. In particular, allowing for individual*area fixed effects, as opposed to individual fixed effects, ensures that changes in house prices due to people moving across areas do not contribute to the estimated house price effect. This is important when trying to isolate wealth effects resulting from changes in the value of owned assets, since relocation decisions may reflect upward/downward mobility. However, it does mean that shorter time series are available for more geographically mobile individuals, such as private renters, which may reduce the precision of estimated house price effects. Standard errors are clustered at the individual and postcode area level.

3.2. Data

Data are taken from the BHPS between 1991 and 2007, which is the last year that data on local house prices are available. This is a nationally representative

survey of more than 5000 British households (approximately 10,000 adults) and contains detailed information about each respondent. Scottish, Welsh, and Northern Irish booster samples added from 1999 onwards are not used.

The BHPS contains a standard measure of mental wellbeing, the General Health Questionnaire (GHQ), which is frequently used to analyze mental wellbeing (see, for example, Clark, 2003; Shields and Wheatley Price, 2005; Gardner and Oswald, 2007; Roberts *et al.*, 2011). The GHQ appears as part of the self-completed questionnaire administered to all household adults. The version of the GHQ in the BHPS has 12 questions, which focus on positive and negative emotions; answers to these questions are aggregated to produce a 0–36 point Likert index of mental wellbeing that is recoded so that higher scores reflect better outcomes. Details are available in the Appendix.

Weekly household income net of national and local taxes/benefits is available for the BHPS (see Jenkins, 2010). Taking into account payments for local public services is important if house prices reflect local area amenities since the costs and benefits of local public services are likely to be positively correlated, and higher local taxes might reduce mental wellbeing.

I construct and match the average house price by postcode area (e.g., cities and clusters of towns) to respondents in the BHPS between 1991 and 2007, which spans both bust (early 1990s) and boom (2000 onwards) phases in the housing market. I also construct the average earnings of male full-time employees and male unemployment rates for the same geography. There are 124 postcode areas in the U.K. and 115 are identified in the BHPS sample spanning Great Britain. Details of postcode area data can be found in the Appendix, which includes a map of postcode areas, and summary statistics for the sample are provided in Table 1. To give a better sense of the size of postcode areas, it is useful to compare the typical number of postcodes (i.e., streets) in postcode areas versus more traditional geographies such as regions; these figures are, respectively, 16,316 and 194,542 streets.³

Two issues arise in using postcode area data. First, postcode areas are larger than local authority districts (LAD), which are responsible for delivering local public services. This issue is discussed further below. Second, prices are not standardized (i.e., not adjusted for the composition of sales) and simply reflect the average of all properties sold in an area. Since changes in log variables approximate growth rates, a weaker assumption that property prices across housing of varying quality increase at the same rate—rather than by the same amount—is made here. More generally, Hamnett (1999) suggests that unstandardized data may have hidden the extent to which house prices fell during the early 1990s but arguably additional spatial variation outweighs this potential drawback.

4. RESULTS

4.1. *Evidence of a Pure Wealth Effect?*

Table 2 reports estimation results from equation (1). For brevity only house price terms are reported but a selection of results including other covariates can be

³Source: All Fields Postcode Directory 2005.

TABLE 1
SUMMARY STATISTICS

	Mean	SD	Min	Max
GHQ	24.94	5.35	0	36
Owner	0.23	0.42	0	1
Mortgaged	0.54	0.50	0	1
Private renter	0.08	0.27	0	1
Age	42.61	15.89	16	75
Partner	0.69	0.46	0	1
Widowed	0.04	0.20	0	1
Divorced/separated	0.07	0.26	0	1
1 child	0.13	0.34	0	1
2 children	0.13	0.34	0	1
3+ children	0.05	0.21	0	1
Children aged 0–4	0.15	0.35	0	1
Children aged 5–11	0.17	0.37	0	1
Children aged 12–15	0.10	0.30	0	1
2 adults	0.59	0.49	0	1
3 adults	0.16	0.37	0	1
4+ adults	0.10	0.30	0	1
Self-employed	0.08	0.27	0	1
Employed	0.58	0.49	0	1
Unemployed	0.04	0.19	0	1
Retired	0.14	0.35	0	1
Student	0.05	0.21	0	1
Long-term sick	0.04	0.19	0	1
ln(weekly work hours + 1)	2.33	1.69	0	4.61
ln(net household weekly income)	5.92	0.66	1.08	9.22
Dividend <£100	0.21	0.41	0	1
Dividend £100–999	0.21	0.41	0	1
Dividend ≥£1000	0.07	0.26	0	1
Satisfied with area	0.92	0.27	0	1
Prefers to move for area-related reason	0.11	0.31	0	1
% in area active in clubs	45.94	8.43	6	89
Expectations: better	0.29	0.45	0	1
Expectations: worse	0.11	0.32	0	1
ln(house price)	11.46	0.43	10.60	13.10
ln(weekly male earnings)	3.77	0.13	3.43	4.43
Male unemployment rate	6.33	3.94	0.93	25.37
<i>N</i>	112793			

Notes: Monetary values adjusted for inflation using the RPI excluding mortgage interest payments (base year 2000). Reference categories are single, no children, 1 adult, family care, and expectations: the same.

found in Table A1 in the Appendix. Column 1 of Table 2 reports results using only demographic variables such as age, marital status, and household composition as control variables. I find a positive and statistically significant correlation between house prices and the mental wellbeing of all homeowners and all renters, which is inconsistent with a pure wealth effect and may indicate that house prices reflect local area characteristics. These results approximately indicate that a 1 percent increase in local house prices increases the GHQ score by 0.005–0.006 units, which corresponds to less than 1 percent of the mean GHQ score.

While it is not possible to reject the hypothesis of equal house price effects across all tenure groups, some interesting differences in the size of these correlations emerge. First, within renters, a larger correlation is observed among private

TABLE 2
 LOCAL AREA HOUSE PRICES AND MENTAL WELLBEING ACROSS THE FULL SAMPLE, MAIN HOUSEHOLD OCCUPIERS, AND HOUSEHOLD HEADS

	(1) All	(2) Main	(3) Head	(4) All	(5) Main	(6) Head
ln(HP)*outright owner	0.584*** (0.203)	0.574** (0.225)	0.527* (0.283)	0.564*** (0.198)	0.548** (0.221)	0.509* (0.279)
ln(HP)*mortgaged owner	0.649*** (0.209)	0.665*** (0.229)	0.581** (0.269)	0.560*** (0.206)	0.574** (0.227)	0.493* (0.264)
ln(HP)*private renter	0.526* (0.282)	0.568 (0.348)	0.480 (0.361)	0.439 (0.282)	0.471 (0.346)	0.375 (0.357)
ln(HP)*social renter	0.479** (0.231)	0.610** (0.256)	0.637* (0.343)	0.364* (0.219)	0.467* (0.250)	0.452 (0.331)
Demographic variables:	yes	yes	yes	yes	yes	yes
Income and labor variables:	no	no	no	yes	yes	yes
N	12253	9617	6930	12253	9617	6930
NT	112793	88159	57619	112793	88159	57619

Notes: *p < 0.1, **p < 0.05, ***p < 0.01. Standard errors clustered by individual and postcode area.

Dependent variable: GHQ score (0 = very poor mental health, 36 = excellent mental health). See equation (1) for details of the empirical specification. Income and labor variables are omitted from columns (1)–(3) and are included in columns (4)–(6).

All denotes all household members, Main denotes persons (maximum two) listed as the main occupiers, and Head denotes persons listed as the head of household.

renters compared to social renters, which suggests that social renters may not derive full benefits of city-wide improvements in amenities and economic opportunities. Second, within homeowners, a larger correlation is observed for mortgaged compared to outright homeowners, which is inconsistent with wealth effects. Third, across homeowners and renters, a larger correlation is observed for the former, suggesting additional benefits of asset ownership. Closer scrutiny, however, casts doubt on this. Tenure status is reported at the household level in the BHPS and some household members, such as relatives or lodgers, reside in owner-occupied households but are not themselves homeowners. The analysis presented in column 2 includes only respondents listed as the main occupiers (maximum two persons per household), while column 3 retains only the head of household, for whom wealth shocks might be most acutely appreciated. Interestingly, the estimated house price effect among homeowners, generally falls—rather than increases—after excluding household members without personal stakes in property. One explanation for this result might be that non-homeowners residing in owner occupied properties benefit from living at a particular address without fully incurring the costs.

Until now, personal economic outcomes, such as income and interest/dividends from investments, and labor market status have been excluded from the analysis because a pure wealth mechanism predicts that wealth shocks influence consumption and leisure decisions so that controlling for the latter hampers observation of this channel. In particular, the consumption/leisure of homeowners is expected to increase, and that of renters to decrease, if rising house prices produce positive (negative) wealth shocks for homeowners (renters). Accordingly, we should observe a reduction (increase) in estimated house price effects across home-

owners (renters) after taking into account (proxies of) consumption and labor market outcomes. Columns 4, 5, and 6 report results based on the full sample and sub-samples most likely to display evidence of wealth effects. These variables have the expected effect on mental wellbeing; for example, more income and wealth are associated with better mental wellbeing while longer work hours reduce mental wellbeing (see column 2 of Table A1 in the Appendix). However, the estimated house price effect falls across all tenure groups, suggesting economic circumstances and house prices are positively correlated. Estimated effects for private renters, while sizeable, are no longer statistically significant but standard errors are more than 25 percent larger for this group, possibly because these individuals are most geographically mobile. If this specification is re-estimated replacing individual*area fixed effects with individual and area fixed effects, estimated correlations for private renters are both larger and precisely determined, suggesting renters gravitate to better areas.

Including household net income permits an approximate calculation of the amount of income that someone with average net household weekly income could forfeit when house prices rise without undermining mental wellbeing. A loss of 1 pence per week could be offset by a £1 annual increase in house prices.⁴ Over the period examined, the average change in house prices is just under £10,000, or £190 per week, suggesting a weekly trade-off of £1.90 (i.e., 0.42 percent of average net income).

The results so far are inconsistent with a pure wealth effect but two considerations require further scrutiny. First, it is possible that intergenerational transfers from now wealthier homeowner parents to their non-homeowner children explain why the mental wellbeing of renters does not decline when house prices rise. Parental information can be attached to a sub-sample of just over 3000 individuals in the BHPS, and in this sample 70 percent of private renters have homeowner parents (compared to 20 percent of social renters). Analysis of this small sub-sample yields different results to the analysis presented above, making it difficult to draw inferences from this sample. However, there is no evidence that outcomes of renters with homeowner parents are better than those without, when house prices rise. Second, the empirical analysis may obscure observing a pure wealth effect by grouping together new and established homeowners (or renters). For example, larger mortgages are required when house prices rise so that increases in house prices in the year of purchase may initially make new homeowners worse off. On the other hand, rising house prices are likely to benefit new renters that previously owned property in the year of downsizing. Allowing different effects of house prices to emerge in the year that individuals switch home ownership status still reveals positive effects of house prices across all individuals. Finally, tenure status may not be exogenous, but the same results emerge if tenure status is replaced by age groups defining younger and older individuals, where the former proxies non-homeowners, and the latter, homeowners. Results are available upon request.

⁴This is calculated as $454 \cdot [1 - ((115144 + 1)/115144)^{-0.56/0.222}]$, where 454 is the average household net weekly income, 115144 the average house price, 0.56 the coefficient for mortgaged homeowners, and 0.222 the coefficient on net weekly income.

4.2. House Prices, Area Amenities, and Economic Opportunities

The evidence so far is inconsistent with a pure housing wealth effect, since all tenure groups report higher levels of mental wellbeing when local house prices rise. This might suggest that house price dynamics reflect area characteristics, such as available amenities and economic opportunities. The following provides an exploratory investigation of this hypothesis. To provide structure on the discussion, the analysis considers potential area amenities followed by economic opportunities, but as the results show, both dimensions are relevant.

4.2.1. Evidence of Area Amenities?

Table 3 explores to what extent better area amenities and attributes might explain the observed correlation between house prices and mental health. For example, if people are satisfied with local public and private infrastructure, they are more likely to respond positively to the question “Overall do you like living in this neighborhood?”. Some areas are also characterized by high levels of community and civic engagement, and greater opportunities for social interaction. In the BHPS, respondents are asked if they actively participate in any of the following organizations: a political party, trade union, environmental group, parents’ association, tenants’ or residents’ group, religious group, voluntary group, other community group, social group, sports club, women’s group, or other organization. The percentage of “active participants” is used to capture this aspect of living at a particular address. This information is asked annually until 1995 and bi-annually afterwards, so is interpolated in intervening years. Column 1 replicates the baseline results for ease of comparison while column 2 reports results including these measures. Both satisfaction with the neighborhood and greater opportunities for

TABLE 3
HOUSE PRICES, AREA AMENITIES, AND MENTAL WELLBEING

	(1)	(2)	(3)	(4)	(5)	(6)
	All	All	No Children Aged <16	Has Children Aged <16	Lives in Area <7 Years	Lives in Area 7+ Years
ln(HP)*outright owner	0.564*** (0.198)	0.574*** (0.198)	0.391 (0.243)	0.516 (0.598)	0.775 (0.854)	0.905* (0.546)
ln(HP)*mortgaged owner	0.560*** (0.206)	0.563*** (0.205)	0.274 (0.260)	0.859* (0.512)	0.004 (0.825)	0.966** (0.476)
ln(HP)*private renter	0.439 (0.282)	0.437 (0.280)	0.209 (0.375)	0.791 (0.684)	0.474 (0.853)	0.875 (0.570)
ln(HP)*social renter	0.364* (0.219)	0.334 (0.218)	0.442 (0.308)	0.115 (0.551)	-0.345 (0.847)	0.895 (0.643)
Satisfied with area		0.754*** (0.074)	0.656*** (0.097)	0.824*** (0.134)	0.806*** (0.178)	0.601*** (0.131)
% in area active in clubs		0.006** (0.003)	0.003 (0.004)	0.018*** (0.006)	-0.008 (0.008)	0.011** (0.005)
N	14206	14206	11557	4820	5450	8543
NT	112793	112793	77030	34739	17131	45771

Notes: Column 1 replicates column 4 of Table 2.
See notes to Table 2.

social engagement are associated with better mental wellbeing. Interestingly, the estimated house price effect is reduced among both types of renters after taking into account this facet of the neighborhood, which suggests that house prices reflect amenities prized by renters. However, a statistically significant correlation is observed after pooling renters.

These are, however, crude measures of area quality, and many other factors, such as schools, transport, and crime are known to determine U.K. house prices (see Gibbons and Machin, 2008, for a review). Arguably parents care more about the quality of local schools than others, and while homeowners without children may benefit from house price capitalization of local schools, private renters without children simply pay higher rents. Differential use of child-centered amenities might therefore shed further light on potential aspects of areas that matter to wellbeing. Of course, areas with good schools are likely to be better across other dimensions, so this analysis is purely suggestive. Columns 3 and 4 split the sample across parents of children aged less than 16 and others. In general, estimated house price effects are smaller in column 3 (no children aged less than 16) than in column 4 (children aged less than 16). The exception occurs among social renters where the estimated house price effect declines, rather than increases, across columns. Parents of school-age children also appear to care more about the other proxies of area quality. There is little evidence, however, that homeowners without children care more about house prices than renters without school-age children.

Finally, columns 5 and 6 investigate whether differences in the effect of house prices emerge across short-term versus long-term residents. The price of a house reflects the expected future stream of rental payments and will therefore reflect the expected evolution of area amenities (and also economic opportunities, which are discussed in more detail below). While all residents benefit from current area quality, only those intending to stay in an area go on to experience future quality. This suggests that house price dynamics might matter more to homeowners and renters exhibiting a stronger attachment to the area, with homeowners exhibiting a weaker attachment potentially gaining more than renters in the same position owing to house price capitalization. Of course, the evolution of house prices may influence the decision to remain in an area but this line of enquiry may nevertheless provide some insight into the process linking house prices with mental wellbeing. This analysis is possible only with panel data, which can be used to calculate the average spell in an area (7 years), and to retain (up to) the first 6 years of data for both short-term (those who leave before 7 years) and long-term (those who stay at least 7 years) residents. The results suggest that long-term residents care more about house prices compared to short-term residents, with larger effects of house prices in column 6. Social opportunities also appear to matter more to long-term residents.

As discussed above, a weakness of postcode area geography is that it is larger than local authority districts (LAD). Since house price data for LADs in England and Wales are available from the Department of Local Communities and Government from 1996, it is possible to compare results across both data sources when applied to the same sample. In fact, postcode area data mimic LAD data quite well, though postcode area data generally produce smaller correlations, suggesting an advantage of house price data that better matches the provision of

public services. However, LAD data are more limited in scope—that is, are only available for England and Wales and the upturn in the housing market, which considerably reduces statistical precision (results are available upon request).

4.2.2. Evidence of Economic Opportunities?

If house prices provide a reflection of economic opportunities, it is likely that house prices correlate with local labor market conditions and perceptions of current and future financial wellbeing. Table 4 investigates this possibility.

Column 1 replicates the baseline results. Column 2 includes the log of average male full-time earnings (similar to Luttmer, 2005; Clark *et al.*, 2009) and the level of unemployment (see Di Tella *et al.*, 2003; Charles and DeCicca, 2008) to proxy local labor market conditions. Neither local earnings nor local unemployment are found to influence mental wellbeing but this may be due to measurement error in these data. House prices are, however, clearly correlated with local labor market conditions given that estimated house price effects are reduced and standard errors increased. Although statistically significant house price effects are not observed across either renter type after including proxies of local labor market conditions, pooling renters yields a statistically significant correlation.

Columns 3 and 4 include current and future perceptions of financial wellbeing. If house prices convey signals of economic opportunities and prospects, they

TABLE 4
HOUSE PRICES, ECONOMIC OPPORTUNITIES, AND MENTAL WELLBEING

	(1) All	(2) All	(3) All	(4) All
ln(HP)*outright owner	0.564*** (0.198)	0.556*** (0.212)	0.543*** (0.184)	0.622*** (0.195)
ln(HP)*mortgaged owner	0.560*** (0.206)	0.549** (0.223)	0.488** (0.199)	0.586*** (0.205)
ln(HP)*private renter	0.439 (0.282)	0.427 (0.298)	0.324 (0.272)	0.462* (0.280)
ln(HP)*social renter	0.364* (0.219)	0.350 (0.226)	0.132 (0.221)	0.362* (0.216)
ln(weekly male earnings)		-0.134 (0.779)		
Male unemployment rate		-0.011 (0.020)		
Position: good			0.980*** (0.045)	
Position: difficult			-2.083*** (0.095)	
Expectations: better				0.192*** (0.045)
Expectations: worse				-0.621*** (0.053)
N	14206	14206	14206	14206
NT	112793	112793	112793	112793

Notes: Column (1) replicates column 2 of Table 2. Column (2) adds local labor market variables, while columns (3) and (4) add current and future perceptions of financial wellbeing, respectively. See notes to Table 2.

may shape perceptions of financial wellbeing, particularly if such perceptions take into account a broader perspective of available opportunities than those made possible by current realizations of economic resources (Pudney, 2011). Perceptions of current financial wellbeing are measured via the following question: “How well would you say you yourself are managing financially these days? Would you say you are . . . ,” with responses “living comfortably,” “doing alright,” “just about getting by,” “finding it quite difficult,” “finding it very difficult,” with two dummy variables created to distinguish between “good” and “poor” financial wellbeing. Perceptions of future financial wellbeing are gauged via the question “Looking ahead, how do you think you yourself will be financially a year from now, will you be,” where respondents can select “better than now,” “worse than now,” “about the same.” While these variables may suffer from reverse causation, or temporal adjustment issues (Pudney, 2011), they may reveal some insights into the way that individuals process signals conveyed in house prices.

Results confirm that perceptions of current and future financial wellbeing are correlated with house prices. Although it is not possible to reject the hypothesis that all estimated effects are equal in column 3, the magnitude of the estimated house price effect drops by approximately a quarter and two-thirds for private and social renters respectively, and it is now not possible to detect a statistically significant association when pooling renters. Perceptions of future financial wellbeing have weaker effects on wellbeing and surprisingly house price correlations are now larger.

5. DISCUSSION

The evidence presented so far is inconsistent with a pure wealth effect. While it is not possible to rule out selection and reverse causality in this analysis, the evidence presented in Tables 3 and 4 raises the possibility that house prices provide a reflection of area amenities and economic opportunities. This prospect is also consistent with the findings of Clark *et al.* (2009), whereby affluent neighbors are associated with better wellbeing, despite earlier evidence based on larger geographies supporting the notion that richer people impose wellbeing penalties via relative income concerns (see Blanchflower and Oswald, 2004; Luttmer, 2005, and references therein). Within smaller areas, the advantages of living in richer neighborhoods (i.e., better area quality) might simply outweigh other concerns, and has the potential to explain why previous research measuring house prices across larger areas does not find widespread effects of house prices on wellbeing (Blanchflower and Oswald, 2004; Luttmer, 2005; Gathergood, 2012). Of course, postcode areas remain sizeable geographies, and stretch the definition of “local,” but measuring house prices over smaller geographies indicates similar, if not more powerful, effects of house prices on mental wellbeing. There are also advantages to large panels, which the current study has access to, when trying to detect correlations.

The association between house prices and wellbeing, while positive and significant for homeowners and renters, is systematically larger for homeowners, which suggests that housing wealth shocks might be relevant. House price effects among homeowners also remain steadfastly significant throughout attempts to

control for area quality. At the same time, however, other evidence does not provide strong support for housing wealth shocks. For example, excluding non-homeowners residing in homeowner households leads to a weaker correlation between house prices and mental wellbeing. Moreover, including proxies of consumption and leisure reduces house price correlations across all tenure groups (not just homeowners as would be expected following housing wealth shocks). So while a pure wealth effect can be ruled out with some degree of confidence, it is less clear what explains the observed differences across homeowners and renters, and it may well be the case that housing wealth effects matter to some extent.

6. CONCLUSION

This paper investigates whether local house prices are linked to mental wellbeing outcomes and attempts to shed light on the nature of this correlation. According to a pure wealth mechanism, increases in house prices are driven by factors not directly influencing mental wellbeing, such as demographic changes, and generate only wealth shocks. This would leave homeowners materially better off, which should make them feel better, with the opposite outcome expected for renters, whose economic situation deteriorates. Increases in house prices may also be driven by better area amenities and economic opportunities, which are likely to have a direct impact on mental wellbeing. Under these circumstances, both homeowners and renters benefit from exposure to more desirable areas, with potentially larger benefits of house price capitalization accruing to owners of increasingly valuable property.

I document a positive correlation between house prices and the mental wellbeing of homeowners and renters, which is inconsistent with a pure wealth effect, and may suggest that house prices provide a reflection of area characteristics. I present suggestive evidence to support this hypothesis.

The determinants of individual wellbeing are of relevance to policy in an age that governments are increasingly interested in measuring, and improving, the wellbeing of the population. This research sheds new light on the drivers of mental wellbeing by examining the relationship between house prices and mental wellbeing. This is an important topic to address given the possibility for housing wealth shocks to create increasing disparities in the mental wellbeing of homeowners and renters during housing booms. However, if local house prices also provide a reflection of area amenities and economic opportunities, the mental wellbeing of homeowners and renters might move in the same direction. The evidence in this paper does not indicate overwhelming disparities in the mental wellbeing of homeowners and renters emerge during periods of rapid house price increases. Future research on this topic would need to more vigorously tackle issues of causality, and would benefit from ever more localized data on house prices and area characteristics.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix

Table A1: Full regression results

Figure A1: Postcode area house prices in 2000 (£1000's)