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Working Paper

What's the melting pot worth? Multiculturalism and house prices

IWH Discussion Papers, No. 11/2025

Provided in Cooperation with:

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Suggested Citation: Cho, Rachel et al. (2025) : What's the melting pot worth? Multiculturalism and house prices, IWH Discussion Papers, No. 11/2025, Halle Institute for Economic Research (IWH), Halle (Saale),
<https://doi.org/10.18717/dpt6j9-t074>

This Version is available at:

<https://hdl.handle.net/10419/319914>

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ISSN 2194-2188

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IWH Discussion Papers are indexed in RePEc-EconPapers and in ECONIS.

What's the Melting Pot Worth? Multiculturalism and House Prices*

Abstract

Is there a multicultural neighborhood price premium? We exploit plausibly exogenous variation in British colonization patterns in Northern Ireland during the early 1600s which created neighborhoods of varying religious composition that persists until today. These religious groups are culturally distinct, but are observationally equivalent ethnically and socioeconomically. A standard deviation increase neighborhood-level multiculturalism raises house prices by 9.6%. Multiculturalism raises property prices by increasing asset liquidity and housing demand as a wider spectrum of society demand houses in these areas. The findings and mechanism contrast sharply with prior evidence showing negative relationships due to homophily, social networks, and identification challenges.

Keywords: homophily, house prices, multiculturalism, segregation

JEL classification: D1, G5, R21, R31

* We received helpful comments and suggestions from Gareth Campbell, Claudia Custodio, Robert French, Pedro Gete, Reint Gropp, Xian Gu, Felix Irresberger, Rustam Jamilov, Sabrina Jeworrek, Roman Kozhan, Xiang Li, Des McCabe, Steffen Müller, Enrico Onali, Micheál Ó Siochrú, Dimitris Petmezas, Dennis Philip, Merih Sevilir, Daniel Streitz, Lena Tonzer, Francesco Vallasca, Jiamin Wang, Xiaoxia Ye, and seminar participants at the ASSA 2025 Meeting, Cardiff, Birmingham, Durham, Exeter, Halle, the 2024 IAF Conference, Queen's University Belfast, St. Andrew's and University College Dublin. Samuel James provided excellent research assistance. We thank the Leverhulme Trust for funding under research project grant number RPG-2022-275. Declarations of interest: none.

1 Introduction

Societies are becoming increasingly multicultural across most developed economies. The impact of this change is often felt within a household’s immediate neighborhood, where residents interact and form social networks. Cultural diversity can undermine social cohesion, reduce the level of public goods provision and erode social capital, thereby lowering neighborhood desirability (Alesina et al., 1999; Alesina and La Ferrara, 2000, 2005; Langella and Manning, 2019; Arbatli et al., 2020). However, evidence also suggests that a multicultural environment has a positive influence over individuals’ success in life and benefits residents through skill acquisition, improved cooperation and learning effects (Alesina et al., 2016; Chetty et al., 2016; Chyn et al., 2025). These externalities potentially create incentives to reside in a heterogeneous neighborhood. The opposing forces imply that the equilibrium value of multiculturalism in housing markets is an empirical question: do households place a premium or a discount on multicultural neighborhoods?

This paper quantifies the revealed preference valuation of a multicultural neighborhood by estimating the premium or discount home buyers pay to live there. Isolating this effect poses two econometric challenges. First, existing research typically approximates multiculturalism using ethnic and linguistic fractionalization. Recent evidence shows these factors correlate weakly with the heterogeneous values, norms, attitudes and traditions that make up culture (Desmet et al., 2017). Second, the literature often finds it difficult to empirically distinguish the causal effect of neighbourhood composition from other, related factors due to endogenous sorting, confounding neighborhood-level amenities and the limitations of cross-sectional data sets.

We draw inferences from Northern Ireland where British colonization during the early 1600s created quasi-random allocations of Catholics (natives) and Protestants (settlers) across small neighborhoods that persist until today. Settlements were established on land seized from rebellious native chieftains, with the remaining territory granted to Irish natives. While British grantees were charged with importing loyal Protestant settlers from their English and Scottish estates, an administrative rule allowed Irish natives to comprise

up to 25% of the population where English and Scottish famines restricted settler availability thus creating religiously-diverse neighborhoods for exogenous reasons. Moreover, colonization proceeded without maps and its architects in London had no ex-ante knowledge of local conditions or topography that may have lasting economic effects (Gardiner and McNeill, 2016). Today, these religious groups are culturally distinct but observationally equivalent in ethnicity, language, and socioeconomic attributes.

Identifying the multicultural neighborhood premium/discount relies on the universe of property transactions in Northern Ireland between 2021 and 2025, and hyper-local neighborhood religious composition data from the UK census. To isolate causality, we leverage neighborhoods' religious make-up in the 1659 Census of Ireland as an instrument to estimate hedonic pricing regressions. Even after almost four centuries, a neighborhood's religious composition in 1659 remains a significant predictor of multiculturalism in that location today. The persistence of the colonial allocation suggests that homophily did not neutralize the initial settlement patterns.

Contrary to prior research, we find that buyers pay a considerable premium to live in a multicultural neighborhood. A one standard deviation increase in multiculturalism significantly raises the average sale price by 9.6%, or £10,385 per property. External validity checks – using property sales in areas of the Republic of Ireland that were also colonized but lie outside Northern Ireland and its institutional characteristics today – corroborate the findings and instrument relevance. Diagnostic checks show the density of British and Irish settlement in 1659 is unrelated to pre-colonization agricultural productivity, infrastructure, local socioeconomic factors, and does not correlate with contemporary observables such as cultural amenities, education, school quality, unemployment, occupational profiles and a range of additional forces that may influence property values.

To illustrate the intuition underlying our econometric results, we develop a stylized housing market model. The model compares equilibrium house prices in segregated and multicultural neighborhoods under fixed housing supply and points to the tension between factors that drive house prices in different directions. Households' homophilic desire to

live among others of the same cultural background, provide an incentive for segregation and contribute to downward pressure on house prices in multicultural neighborhoods. In contrast, when multicultural neighborhoods offer, for example, attractive features – such as better schools or more skilled residents and thus learning externalities – this can offset the effects of homophily and raise overall demand and house prices there. Our stylized model shows that, in principle, diverse neighborhoods may either have a price premium or a discount, depending on the dominance of factors driving housing demand. Consistent with this framework, our empirical strategy exploits quasi-random variation in neighborhood composition to estimate the net effect of multiculturalism on house prices, capturing the aggregate influence of factors such as homophily and neighborhood desirability.

In line with the model’s predictions, the data show multiculturalism transmits to real asset prices by increasing demand. Properties in culturally diverse areas attract buyers from a broader spectrum of society, whereas segregated neighborhoods primarily appeal to households from the same background as existing residents. In multicultural neighborhoods, properties are more liquid and are significantly more likely to attract buyers from both cultures. A standard deviation increase in multiculturalism raises (lowers) the probability of an inter (intra) cultural transaction by 27% (11%), highlighting that these areas appeal to buyers across the cultural divide.

This paper contributes to the literature on house price differentials and ethnic/racial segregation. The dominant view is that households pay more for an identical unit of housing in a segregated neighborhood due to homophilic preferences, demand for co-located group-specific amenities, or because discrimination in majority out-group neighborhoods reallocates demand to areas with a higher own-group share (King and Mieszkowski, 1973; Cutler et al., 1999; Box-Couillard and Christensen, 2024).¹ In contrast, we find that buyers pay a premium to live in heterogeneous neighborhoods and a novel demand-driven transmission mechanism that is distinct from households’ preferences and discrimination. We answer the call of Jackson et al. (2017) to utilize well-identified variation to disentangle

¹A parallel body of work estimates the economic consequences of ethnolinguistic diversity. Generally, more homogeneous societies exhibit better outcomes but many studies face difficulties in isolating causality. See Alesina and La Ferrara (2005) and Guiso et al. (2006) for reviews.

the equilibrium value of multiculturalism from other sources of influence.

Related articles show within-ethnicity price premiums (discounts) for properties in neighborhoods where a group constitutes the majority (minority) due to incomplete search as ethnicity-specialized real estate agents source buyers within their social networks (Wong, 2013, 2014; Agarwal et al., 2019; Davis et al., 2024). Conversely, we find no evidence of inter- or within-culture price premia or differentials irrespective of a neighborhood’s multiculturalism and the background of the transacting parties. Our paper makes two contributions to this literature. First, we estimate the probability of inter-culture matching is significantly higher (lower) in multicultural (segregated) neighborhoods. This suggests buyer-seller identities have limited effects on prices, and the multicultural premium reflects a greater number of potential buyers bidding up equilibrium prices in these neighborhoods. Second, existing research focuses mainly on Singapore and the United States. The evidence we present suggests market dynamics behave differently in other contexts.

Another body of research studies social interactions and neighborhoods’ residential composition. In most theoretical models, even slightly homophilistic preferences can produce separating equilibria (e.g. in culture, ethnicity or religion) across geographical space within a short period of time (Schelling, 1969, 1971; Cutler and Glaeser, 1997; Patacchini and Zenou, 2016). Empirical evidence in the US further suggests tipping points beyond which neighborhoods rapidly transition from mixed to uniform occupancy (Card et al., 2008; Shertzer and Walsh, 2019). Uniquely, our data allow us to trace the composition of neighborhoods across almost 400 years. Contrary to theoretical models’ predictions, and despite the groups in our setting having strong homophilic preferences, we do not find perfect sorting even over such a long time span. The correlation between a neighborhood’s cultural share in 1659 and 2021 is 0.4. Explaining the underlying reasons falls outside the scope of this paper, but our findings suggest that multiculturalism’s economic benefits may dominate the utility gained from locating nearby in-group members.

The paper is structured as follows. Section 2 outlines a housing market model featuring neighborhood diversity. Section 3 provides institutional details while in Section 4

we describe the data and econometric methods. Section 5 reports and discusses the findings and transmission mechanisms. We conduct robustness tests in Section 6 and draw conclusions in Section 7.

2 Conceptual Framework

Across the world, neighborhoods’ residential composition varies sharply between segregated and multicultural. Figure 1 illustrates the high degree of variation along ethnic, racial, and religious lines in Belfast, London, New York, and Sarajevo. Similar patterns exist in myriad cities and regions irrespective of economic development. This paper focuses on Northern Ireland, where segregated neighborhoods – predominantly Catholic or Protestant – exist alongside multicultural areas where households from both cultures live together. To conceptualize the effects of multiculturalism on house prices, we introduce a simple, stylized housing model that articulates the key mechanisms and intuition behind the econometric tests.

Suppose there are three distinct neighborhoods, labeled Neighborhood 1, Neighborhood 2, and Neighborhood 3. Each neighborhood is populated by the same number of households and has a fixed and equal supply of housing, denoted by \bar{S} , such that

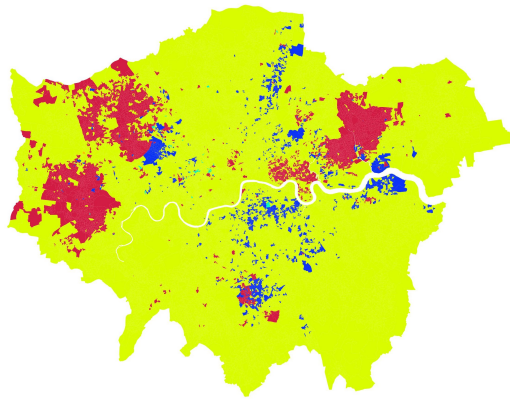
$$\bar{S}_1 = \bar{S}_2 = \bar{S}_3 = \bar{S}.$$

This assumption is consistent with Northern Ireland’s institutional characteristics: column 1 in Online Appendix Table 1.A shows neighborhoods contain an equal number of houses irrespective of their residential composition.

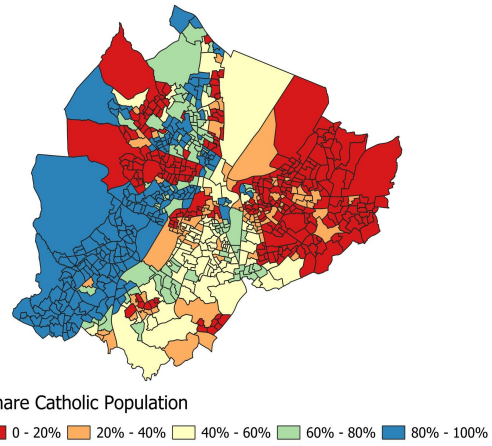
In this framework, there are two types of households, denoted c and p , that have homophilic preferences giving them taste for living in proximity to people from the same background. Households of type p prefer to live in either Neighborhood 1 or Neighborhood 3, while c type households prefer Neighborhood 2 or Neighborhood 3. Neighborhoods 1 and 2 are thus culturally segregated, while Neighborhood 3 is multicultural since both

Figure 1: Neighborhood Composition Examples

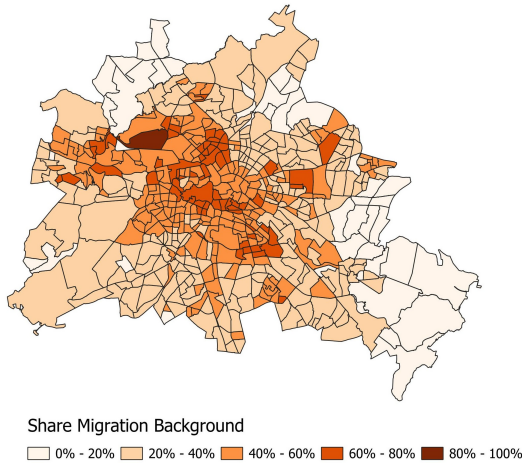
A: London



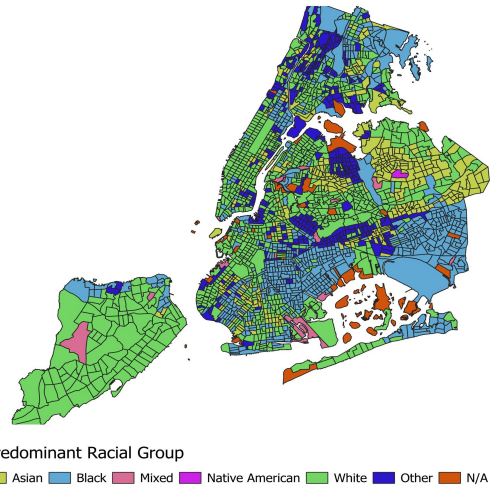
B: Belfast



C: Berlin



D: New York



Notes: Panel A maps London's predominant ethnic group across Lower Super Output Areas using the 2021 UK Census (Office for National Statistics). Panel B depicts the percentage of Catholics in Belfast's Data Zones from the 2021 Northern Ireland Census (NISRA). Panel C presents the share of residents with a migration background in Berlin's LOR-Planungsräume based on register statistics as of 31 December 2024 (Amt für Statistik Berlin-Brandenburg). Panel D shows the predominant racial group in each 2020 census tract of New York City using the U.S. Census Bureau's 2020 Redistricting (P.L. 94-171) data.

types coexist.² Apart from their preference to live in certain neighborhoods, the two types of household have identical characteristics.³

In Neighborhood 1, populated only by type p households, housing demand is inversely related to prices, and is given by

$$D_1(P_1) = \alpha_p - \beta_p P_1.$$

Similarly, demand in Neighborhood 2, where only type c households live, is given by

$$D_2(P_2) = \alpha_c - \beta_c P_2,$$

where, P_1 and P_2 denote house prices in Neighborhoods 1 and 2, respectively. The parameters α_j represent baseline demand for housing whereas the β_j parameters reflect the sensitivity of demand to price changes for each household type $j \in \{p, c\}$. Setting demand equal to the fixed housing supply, \bar{S} , in each neighborhood yields equilibrium prices

$$P_1 = \frac{\alpha_p - \bar{S}}{\beta_p} \quad \text{and} \quad P_2 = \frac{\alpha_c - \bar{S}}{\beta_c}.$$

In the multicultural Neighborhood 3, both types c and p households demand housing, leading to a combined demand function expressed as

$$D_3(P_3) = (\alpha'_c - \beta'_c P_3) + (\alpha'_p - \beta'_p P_3),$$

with house price P_3 . The parameters α'_c and α'_p represent the baseline housing demand of types c and p in Neighborhood 3, while β'_c and β'_p capture their respective sensitivities to price. For equilibrium in Neighborhood 3, we again equate demand with supply, $D_3(P_3) =$

²Catholics and Protestants have almost equal aggregate population shares of 46% and 43%, respectively, in the 2021 Census. The remaining 11% of the population does not identify as Catholic or Protestant. This group may plausibly demand housing in all areas. Indeed the data show non-Catholics/non-Protestants are evenly distributed across neighborhoods with a mean (median) neighborhood population share of 11.33% (9.97%), indicating the effect of this group on housing demand is homogeneous across locations. For this reason, we do not explicitly model this group.

³Section 3 provides quantitative support for this assumption. Specifically, Northern Ireland's Catholics and Protestants are observationally equivalent in their socioeconomic characteristics.

\bar{S} . Substituting the demand function, we obtain an expression for the equilibrium price

$$P_3 = \frac{\alpha'_p + \alpha'_c - \bar{S}}{\beta'_p + \beta'_c}.$$

To understand whether multiculturalism or segregation leads to higher house prices, we compare prices in the culturally diverse Neighborhood 3 with those in the segregated Neighborhoods 1 and 2 to find the conditions for $P_3 > P_2$ and $P_3 > P_1$. The price in Neighborhood 3 exceeds that in Neighborhood 1 if

$$\begin{aligned} P_3 &> P_1 \\ \Leftrightarrow \alpha'_p \beta_p + \alpha'_c \beta_p - \alpha_p \beta'_p - \alpha_p \beta'_c &> \bar{S}(\beta'_p + \beta'_c - \beta_p). \end{aligned}$$

Similarly, the price in Neighborhood 3 exceeds price in Neighborhood 2 if

$$\begin{aligned} P_3 &> P_2 \\ \Leftrightarrow \alpha'_p \beta_c + \alpha'_c \beta_c - \alpha_c \beta'_p - \alpha_c \beta'_c &> \bar{S}(\beta'_p + \beta'_c - \beta_c). \end{aligned}$$

Since we assume c and p households are identical in characteristics apart from their location preferences, we impose that price sensitivities across neighborhoods and types are equal, $\beta_p = \beta'_p = \beta_c = \beta'_c = \beta \neq 0$. Survey evidence in Section 3 supports this assumption. This allows us to simplify the above conditions to

$$\alpha'_p + \alpha'_c - 2\alpha_p > \bar{S}, \tag{1}$$

for the case $P_3 > P_1$ and

$$\alpha'_p + \alpha'_c - 2\alpha_c > \bar{S}, \tag{2}$$

for $P_3 > P_2$. Under the assumption of equal price sensitivities, equations (1) and (2) show that prices in the multicultural neighborhood exceed those in the segregated neighborhoods

if baseline demand is relatively higher in the multicultural area.

This model is sufficiently flexible to account for both higher house prices in multicultural relative to segregated neighborhoods, as well as the opposite outcome. The outcome depends on the parameters α'_j and α_j for baseline demand, which can be driven by various factors that are not individually modeled in our stylized framework. They include, for example, the social pressure of residents to live with one's own type, which would drive the tendency of $\alpha'_j < \alpha_j$.⁴ Other examples are school quality, the occupational and educational profiles of inhabitants. In the case of Northern Ireland, Online Appendix Table 1.A shows local school performance, measured through pupils' grades in compulsory examinations at age 16, as well as the share of residents working in managerial and professional occupations and degree holders is significantly higher in multicultural neighborhoods which contributes to driving $\alpha'_j > \alpha_j$. Other factors may also drive demand in this direction, such as the fact that homes in multicultural neighborhoods may attract more potential buyers, making home ownership in multicultural neighborhoods valuable as homes are more liquid assets. Whether the factors that drive α'_j above α_j dominate, or vice versa, remains an open question, one that our empirical tests address.⁵

Capturing the various determinants of baseline housing demand, and their effects on property prices, is notoriously difficult. This paper focuses on the aggregate effects of these forces on house prices which the model shows may, in principle, lower or increase house prices in multicultural neighborhoods. In Section 4, we address the question of the effects of neighborhood composition on house prices from an empirical standpoint. We use a novel instrumental variable strategy based on historical quasi-random cultural allocations to identify the net effect of various factors influencing housing demand.

⁴For the case of Northern Ireland, we find strong evidence of homophily in the data. Table 1 shows segregated neighborhoods exist while in Table 2 people report they are similar to others living in their neighborhood.

⁵The data show that in the overall population Catholics and Protestants are observationally equivalent in their socioeconomic characteristics (see Table 2). However, Online Appendix Table 1.A shows the composition of people living in multicultural and segregated neighborhoods differs in terms of skills and educational attainment.

3 Background Details

Northern Ireland was created in May 1921 following the partition of Ireland and is part of the UK.⁶ It comprises six counties of the historic province of Ulster, while the remaining three belong to the Republic of Ireland.⁷ Until the mid-1500s, Ireland was largely controlled by native clans and remained almost entirely Catholic, untouched by the Reformation. Under the Tudor monarchy, the English Crown began extending its authority beyond the Pale, a small region around Dublin. Resistance peaked with the Nine Years' War (1593–1603), led by a confederation of Ulster chiefs who were ultimately defeated. Most submitted to the Crown, retained their lands, and were pardoned. However, two chieftains fled to Europe in 1607 to seek support for a rebellion, whereupon their departure was declared treasonous, and their Ulster lands were confiscated.

In 1609, the Ulster Plantation was launched to assert British control by colonizing these seized lands. Estates were granted to English and Scottish nobles (Undertakers), military veterans (Servitors), and loyal Irish grantees. Estate allocations were made from London, with little knowledge of local conditions, as there was no prior English presence in Ulster, trade links, and the British Crown had no maps of the region until 1658 (Gardiner and McNeill, 2016).

Colonization created neighborhoods of varying religious diversity. Servitors and native grantees were permitted an unlimited number of Irish tenants on account of their military experience and local standing, while the non-seized area was granted to the native Irish. These areas tended to become homogeneously Catholic (Irish). Undertakers were charged

⁶Ireland's political status was a fractious issue in UK politics during the 1800s and early 1900s. After the Irish War of Independence (1919–1921), the Government of Ireland Act 1920 intended to partition Ireland into two self-governing polities that would remain part of the UK. The six north eastern counties (Antrim, Armagh, Derry/Londonderry, Down, Fermanagh, and Tyrone) were to form 'Northern Ireland' with the remaining counties becoming 'Southern Ireland'. The Act was passed by the British parliament in November 1920 and came into force on May 3, 1921. Southern Ireland was largely unrecognized by its citizens who instead supported the self-declared Irish Republic in the Irish War of Independence. Following the conflict, under the Anglo-Irish Treaty of December 1921 Southern Ireland left the UK and became the Irish Free State which evolved into the Republic of Ireland. A clause in the Treaty granted Northern Ireland the right to opt out and remain in the UK, which it did.

⁷There are four provincial regions of Ireland. Ulster contains the counties of Antrim, Armagh, Derry/Londonderry, Down, Fermanagh, and Tyrone which are the constituent counties of Northern Ireland. The counties Cavan, Donegal, and Monaghan are part of the Republic of Ireland.

with clearing natives from their estate and importing settlers from their English and Scottish lands. Settlers were mandated to be Protestant, English-speaking, and loyal to the King. However, an administrative rule allowed 25% of the population in an Undertaker’s estate to comprise Irish natives where famines in England and Scotland restricted settler availability, and created exogenous variation in neighborhoods’ cultural composition.⁸

3.1 Contemporary Identities

Efforts to religiously convert the native population failed due to linguistic differences, hostility following land dispossession, and the indigenous Catholic clergy’s prevention efforts (Elliott, 2001). An enduring legacy of colonization is that contemporary Catholics (Protestants) are largely the descendants of historic natives (settlers). Today, both communities speak English and are ethnically white, but retain distinct cultures demarcated by religious identity (Lee, 1985; McAllister, 2000; Muldoon et al., 2007).⁹

Table 1 provides quantitative insights into the groups’ identities using data from the nationally representative Northern Ireland Life and Times survey.¹⁰ For each variable, we report the mean value among Catholics and Protestants, the difference between them, and the *t*-statistic from a *t*-test of equality in means. Religion is a basis for group identity, constituting the primary basis for party politics, which revolves around the sovereignty issue of remaining in the UK (Unionism) versus reunification with the Republic of Ireland (Nationalism). Table 1 shows Catholics are significantly more likely to support Nationalist parties, view themselves as Nationalists and favor Irish reunification, whereas Protestants typically support Unionist parties, think of themselves as being Unionists and advocate remaining part of the UK.

The table further shows that religious background is a strong predictor of which culture

⁸Undertakers were required to import families comprising at least 24 adult men per 1,000 granted acres from their British lands. Estates ranged in size between 1,000 and 2,000 acres, with 30% reserved as a demesne for the grantee. This geographically size led many tenants to choose to reside near their fields rather than locate in nucleated settlements (Hunter, 2018).

⁹Northern Ireland also has comparatively low rates of immigration, relative to the rest of the UK, or the Republic of Ireland.

¹⁰Online Appendix Table 4.B describes the data set. Each observation has a weight that allows us to construct a nationally representative sample.

Table 1: Identity and Attitudes

| Variable | Mean | | Diff | t-stat |
|---|----------|------------|---------|-----------|
| | Catholic | Protestant | | |
| <i><u>Political outlook</u></i> | | | | |
| Support a Nationalist party | 0.6005 | 0.0350 | 0.5655 | 22.87*** |
| Support a Unionist party | 0.0075 | 0.5580 | -0.5504 | 21.80*** |
| Do you think of yourself as a Nationalist? | 0.6407 | 0.0219 | 0.6188 | 26.18*** |
| Do you think of yourself as a Unionist? | 0.0101 | 0.6608 | -0.6508 | -26.88*** |
| Should NI remain part of the UK? | 0.2111 | 0.7834 | -0.5723 | -20.33*** |
| Should NI reunify with ROI? | 0.5302 | 0.0569 | 0.4733 | 18.13*** |
| <i><u>National & religious identity</u></i> | | | | |
| See yourself as part of Catholic community | 0.8769 | 0.0022 | 0.8747 | 56.19*** |
| See yourself as part of Protestant community | 0.0025 | 0.8271 | -0.8246 | -43.13*** |
| Spouse is Catholic | 0.8256 | 0.0702 | 0.7553 | 27.82*** |
| Spouse is Protestant | 0.0553 | 0.5580 | -0.5027 | -18.53*** |
| Identify as British | 0.0377 | 0.4967 | -0.4590 | -17.23*** |
| Identify as Irish | 0.6683 | 0.0263 | 0.6421 | 27.36*** |
| Spouse has same national identity | 0.8702 | 0.9106 | -0.0404 | -1.54 |
| <i><u>Cultural traditions & community perceptions</u></i> | | | | |
| Catholic traditions enhance society | 3.1717 | 2.5329 | 0.6388 | 8.23*** |
| Protestant traditions enhance society | 2.6121 | 2.7593 | -0.1472 | -1.75* |
| Favorable view of Catholic people | 3.3829 | 2.9648 | 0.4180 | 6.16*** |
| Favorable view of Protestant people | 2.8111 | 3.2039 | -0.3929 | -5.55*** |
| Bonfires are legitimate cultural celebration | 0.1306 | 0.5780 | -0.4474 | -15.22*** |
| Feel safe in an Orange Hall | 1.4246 | 3.0154 | -1.5908 | -14.83*** |
| Feel safe in a GAA club | 3.5201 | 1.8458 | 1.6743 | 16.61*** |
| Feel safe in a Catholic school | 3.7060 | 2.7121 | 0.9939 | 12.21*** |
| Feel safe in a Protestant school | 2.9874 | 3.2741 | -0.2874 | 3.38*** |
| <i><u>Neighborhood composition</u></i> | | | | |
| Live in a Catholic area | 0.4648 | 0.0547 | 0.4101 | 15.78*** |
| Live in a Protestant area | 0.0729 | 0.4496 | -0.3767 | -13.56*** |
| Live in a mixed area | 0.4422 | 0.4464 | -0.0042 | -0.12 |

Notes: This table uses individual microdata from the 2023 Northern Ireland Life and Times Survey. Respondents are aged 18 years or over and live in private households across Northern Ireland. Each respondent reports whether they identify as Catholic or Protestant, which we encode using a dummy variable. We drop observations that do not report being Catholic or Protestant, although there are only a few observations of this group. The table reports t-tests comparing attitudinal responses to questions whose answers are either yes/no or scored on a Likert-scale ranging between 0 (low) and 4 (high). Online Appendix Table 4.B describes the variable description of each variable in the data set. Catholic (Protestant) denotes the mean response to a question by people who identify as being Catholic (Protestant). Diff is the difference between the Catholic and Protestant mean values. t-stat reports the t-statistic from a test of equality that the difference between the mean Catholic and Protestant values is zero. *** indicates statistical significance at the 1% level. Source: ARK. Northern Ireland Life and Times Survey, 2023 [computer file]. ARK www.ark.ac.uk/nilt [distributor], August 2024.

a respondent views themselves as belonging to. Each group has distinct cultural traditions, and typically espouses a more favorable view of their own culture’s traditions, people and amenities than the other.¹¹ Culture aligns with national identity, with Catholics (Protestants) significantly more likely to report being Irish (British), and their spouse typically holds the same national identity. Intermarriage between the groups was rare historically, and even today only 7% (6%) of Catholics’ (Protestants’) spouses are Protestant (Catholic). Finally, the groups exhibit homophilic preferences as shown by the existence of segregated Catholic and Protestant neighborhoods. However, multicultural areas also exist and contain equal shares of residents from each culture.

A consequence of these entrenched cultural divisions is a high level of religious segregation in Northern Ireland’s schools.¹² Figure 2 demonstrates how parental choices map almost one-to-one onto religious affiliation: the vast majority of schools admit either predominantly Catholic or Protestant cohorts. Even in ‘mixed’ neighborhoods, few schools have balanced religious compositions, and those that do are integrated institutions which are relatively uncommon. Schools’ religious profile thus tends to be a cultural amenity.

3.2 Socioeconomic Characteristics

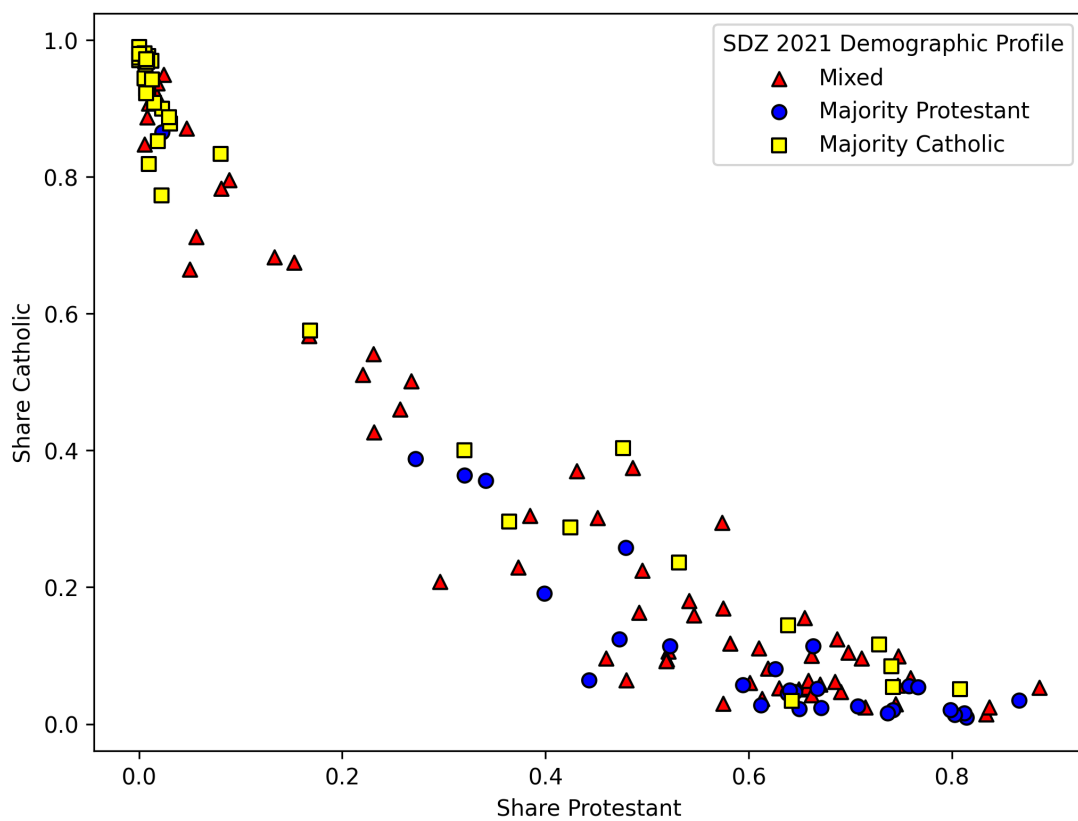
Despite sharply different identities, Catholics and Protestants are observationally equivalent along socioeconomic dimensions. Table 2 presents evidence using household-level information from the Understanding Society Household Panel survey. For each variable, the table provides the mean among Catholic and Protestant households, as well as *t*-tests on the equality of various household characteristics between the groups.

Throughout the table, the *t*-statistics are insignificant. For example, the groups have

¹¹Bonfires and Orange Halls are associated with the Orange Order, a fraternal organization that defends Protestant civil and religious liberties. These events can be controversial and Catholics sometimes voice concerns that they are sectarian and triumphalist. Members meet at Orange Halls. The Gaelic Athletic Association is an openly nationalist sports association whose members are predominately Catholic. Its constitution states, ‘Those who play its games, those who organise its activities and those who control its destinies see in the GAA a means of consolidating our Irish identity.’ See <https://www.gaa.ie/api/pdfs/image/upload/wyb4qbqzii6vstod1ygg.pdf>

¹²Although there is no statutory requirement for religiously segregated schooling in Northern Ireland, in practice the vast majority of schools are managed by denomination—‘controlled’ schools under Protestant authorities and ‘maintained’ schools under the Catholic Church—while a small integrated sector (less than 10% of post-primary places) formally promotes a mixed-faith intake.

Figure 2: School Segregation



Notes: Each dot denotes a secondary school which educates students between the ages of 11 and 18. This graph illustrates the Catholic and Protestant share of school students registered at each secondary school during the 2022/23 academic year. Students are classified as Catholic, Protestant, or Other (which contains other individuals from other Christian faiths, non-Christians and those with other or no religious beliefs). Schools are classified by the demographic profile of the Census 2021 Super Data Zone in which they are located. Majority Catholic/Protestant areas are defined as neighborhoods with a $\frac{2}{3}$ majority of the respective religious group. Mixed neighborhoods are all others. Source: NI School Census 2022/23.

equivalent gross and net monthly household income, hours worked per week, employment probabilities, and work in similar occupations and industries. There are no significant differences in property size or value, mortgage characteristics (outstanding balance, term, type of mortgage), housing costs (monthly mortgage/rent payment), or wealth (home equity), the incidence of late housing payments, or financial outlook. Both cultures have similar consumption patterns, white goods ownership, education qualifications and marital status. There is also no statistical difference in ethnicity between the groups, and both cultures speak English as their native language.¹³ They report their neighborhoods are equally cohesive, and each group has a similar propensity to remain there.

4 Data

The empirical tests draw on various data sources.

4.1 Property Sales

We collect information from `propertypal.com` on every property listed for sale in Northern Ireland, between January 2021 and January 2025.¹⁴ For each property, we observe the address (street name, number, postcode), property characteristics (number of bedrooms, reception rooms, bathrooms), property type (detached, semi-detached, terrace, apartment, etc.) and the real estate agent marketing the property. The data report the initial price and listing date, the sales price and the sold subject-to-contract (STC) date.¹⁵ Towards the end of the sample, the number of unique daily viewers of each listing is also available to us. Online Appendix D describes similar data for sold properties in the Republic of Ireland that we use for external validity tests.

¹³Census 2021 data show that 97% of Northern Ireland’s population identifies as white.

¹⁴`Propertypal.com` is a platform that aggregates estate agents’ property listings. It features almost all properties advertised for sale.

¹⁵The STC date is when the vendor and buyer agree to a sale in principle. At this point, contracts are not exchanged, but the legal process of conveyancing begins. We use the STC rather than the subsequent sale completion date to measure listing duration because this excludes legal delays.

Table 2: Between Group Comparisons

| Variable | Mean | | Diff | <i>t</i> -stat |
|--|------------|----------|--------|----------------|
| | Protestant | Catholic | | |
| <i>Income & employment</i> | | | | |
| Monthly gross HH income | 2,813 | 2,844 | -30.70 | -0.44 |
| Monthly net HH income | 2,453 | 2,452 | 1.56 | 0.02 |
| Number not employed in HH | 0.99 | 1.00 | -0.02 | -0.58 |
| Managerial position | 0.36 | 0.36 | 0.00 | 0.18 |
| Weekly job hours | 32.90 | 32.00 | 0.90 | 1.57 |
| Weekly overtime hours | 2.25 | 2.11 | 0.14 | 0.55 |
| Weekly paid overtime hours | 4.17 | 3.79 | 0.38 | 0.67 |
| Industry code | 63.54 | 65.02 | -1.48 | -1.16 |
| Private employer | 0.57 | 0.58 | -0.00 | -0.10 |
| <i>Property & housing costs</i> | | | | |
| Rooms in house | 5.18 | 5.15 | 0.03 | 0.54 |
| Property cost | 10.64 | 10.68 | -0.03 | -0.33 |
| Year mortgage began | 2000 | 2000 | 0.07 | 0.09 |
| Remaining mortgage term | 15.45 | 15.73 | -0.28 | -0.37 |
| Mortgage balance | 10.76 | 10.79 | -0.03 | -0.29 |
| Interest only mortgage | 0.05 | 0.06 | -0.01 | -0.36 |
| Monthly mortgage | 442 | 489 | -46 | -1.34 |
| Monthly rent | 306 | 316 | -10 | -0.67 |
| <i>Household wealth & finances</i> | | | | |
| Home equity | 11.55 | 11.40 | 0.14 | 1.07 |
| Late on housing | 0.10 | 0.12 | -0.02 | -1.33 |
| Financial outlook | 2.66 | 2.64 | 0.02 | 1.07 |
| <i>Household expenditure</i> | | | | |
| Gas bill | 401 | 401 | 8.83 | 0.34 |
| Heating oil bill | 913 | 936 | -23 | -1.23 |
| Electricity bill | 637 | 662 | -25 | -0.91 |
| Monthly food bill | 178 | 174 | 3.95 | 0.94 |
| Monthly supermarket expenditure | 143 | 145 | -1.56 | -0.42 |
| <i>White goods</i> | | | | |
| Washing machine | 0.98 | 0.98 | -0.00 | -0.27 |
| Drier | 0.68 | 0.68 | 0.00 | 0.10 |
| Dish washer | 0.52 | 0.50 | 0.02 | 0.92 |
| Mobile phone | 0.89 | 0.89 | -0.00 | -0.28 |
| <i>Health</i> | | | | |
| General health | 2.66 | 2.63 | 0.03 | 0.55 |
| GP visits | 1.47 | 1.51 | -0.04 | -0.55 |
| Outpatient visits | 0.79 | 0.80 | -0.02 | -0.33 |
| Hospital visits | 1.89 | 1.88 | 0.01 | 0.40 |
| <i>Education & relationships</i> | | | | |
| Years of education | 14.13 | 14.19 | 0.06 | 0.10 |
| Married | 0.17 | 0.15 | 0.02 | 1.26 |
| <i>Ethnicity & neighborhood</i> | | | | |
| Ethnicity | 1.13 | 1.16 | -0.03 | -0.31 |
| Similar to others in neighborhood | 2.08 | 2.03 | 0.05 | 0.77 |
| Will stay in neighborhood | 1.91 | 1.97 | -0.06 | -0.85 |
| Buckner's neighborhood cohesion | 3.87 | 3.86 | 0.01 | 0.16 |

Notes: This table uses household-level data from wave 12 of the Understanding Society Survey. The number of observations varies between variables because not all respondents provide an answer to each survey question. Protestant (Catholic) indicate the mean value of each variable in the survey among people from Northern Ireland who report being Protestant (Catholic). 'Diff' is the difference between the mean value for Protestants and Catholics. *t*-stat is the test statistic from a *t*-test on the equality of the mean Protestant and Catholic values for each variable.

4.2 Title Deeds

To gain additional insights into the cultural background of transacting parties, we obtain a representative random sample of properties' title deeds from the Land & Property Services (LPS).¹⁶ Each title deed records the property address, the date of each sale, the names and previous address of both the current and previous registered owners, and an indicator for whether there is an outstanding mortgage. Online Appendix Figure 2.E shows the deeds sample is representative of the property sales data set. Importantly, title deeds allow us to infer the cultural affiliations of a property's buyer and seller using surnames. In Northern Ireland, surnames often indicate religious background, and persist through generations. We thus retrieve the religious affiliation and surname of every respondent to the 1901 Census of Ireland (approximately 4.5 million individuals) and classify a property's owner as Catholic or Protestant if over 80% of individuals with the same surname in 1901 are Catholic or Protestant, respectively.

4.3 Archival Data

The 1659 Census of Ireland provides the earliest granular population record at scale. Between 1654 and 1659 surveyors visited each townland and counted the number of 1) Irish, and 2) English and Scottish inhabitants. We digitize the census and aggregate townland population counts to the parish level. Parishes are traditional units of ecclesiastical and civil administration that persisted with little change from late medieval times. They are also important for local civil society, focused, for example around the parish church. See Online Appendix Figure 4.G for further details.

The 1659 census does not contain returns for county Tyrone which contains 7% of property sales observations.¹⁷ We therefore impute parish-level population data for Tyrone

¹⁶In Northern Ireland, it is mandatory that either the new property owner or their solicitor notifies LPS upon completion of a transaction, after which LPS updates the property's official title deed. LPS acts as a commercial data provider; consequently, their substantial fees limited the scope of our data collection to a random subsample of transactions.

¹⁷The introduction to the census notes that the absence of data may have been because the surveyors, who concurrently collected poll tax, embezzled this money and did not report to the Exchequer (page iv).

using the 1666 Hearth Money Rolls (HMR).¹⁸ Robinson (1978) provides a map of Tyrone indicating each British and Irish household’s location that paid the hearth tax in 1666. We overlay the parish boundaries and count the number of British and Irish households in each parish.¹⁹ To establish the accuracy of the HMR as a population measure, we retrieve HMR data for counties Antrim (1669) and Derry/Londonderry (1663) and compute the correlation between the number of people living in each parish as reported by the 1659 census and HMR.²⁰ The pairwise correlations are significant at 1% and equal 0.6895 for Antrim and 0.6904 in Derry/Londonderry. Inevitably, the correlation is less than unity because the census counted individuals whereas the HMRs report the number of hearths, which more likely captures households. Ultimately, the historic diversity variable we use in the econometric tests relies on the relative presence of British and Irish in a parish, rather than level-based measures. The imputation procedure is thus likely informative.

4.4 Multiculturalism Variables

We follow the 2021 census and define a neighborhood as a data zone (DZ).²¹ We then calculate multiculturalism using an inverse Herfindahl-Hirschman index (HHI)

$$\begin{aligned} M_n^{2021} &= 1 - HHI_n \\ &= 1 - (Catholic_n^2 + Protestant_n^2 + Other_n^2), \end{aligned} \tag{3}$$

where M_n^{2021} denotes multiculturalism in neighborhood n in the 2021 census; $Catholic_n$, $Protestant_n$, and $Other_n$ are the ratio of Catholics, Protestants, and Others (that is, people who identify neither as Catholic nor Protestant) to the total population living in neighborhood n , respectively. A value of 0 implies complete segregation whereas increasing

¹⁸The Irish Parliament passed the Hearth Money Act in 1662 to raise funds to support the royal household following the restoration of King Charles II. A tax of 2 shillings was levied on every hearth or ‘other place used for firing’ throughout Britain and Ireland.

¹⁹See Online Appendix Figure 2.D for the Robinson (1978) household location map.

²⁰We use HMR data from Antrim and Derry/Londonderry as these are the only sources available.

²¹DZs are geographically delimited areas that have no administrative purpose other than for statistical reporting in the decennial UK census. In 2021, there were 3,780 DZs in Northern Ireland.

Table 3: Summary Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------------------------------|--------|----------|-----------|----------|---------|
| Price | 31,897 | 11.5968 | 0.459 | 10.6018 | 12.9663 |
| Multiculturalism ²⁰²¹ | 31,897 | -0.9466 | 0.4884 | -3.5885 | -0.4113 |
| Multiculturalism ¹⁶⁵⁹ | 31,897 | -0.9560 | 0.8278 | -11.5129 | -0.6931 |
| Bedrooms | 31,897 | 3.1961 | 0.8957 | 1 | 14 |
| Bathrooms | 31,897 | 1.6342 | 0.8241 | 1 | 11 |
| Receptions | 31,897 | 1.5347 | 0.7575 | 1 | 8 |
| Population | 31,897 | 6.2322 | 0.2779 | 4.9488 | 7.6728 |
| GVA | 31,897 | 3.2482 | 1.0994 | 0.673 | 7.9335 |
| Rural | 31,897 | 0.2734 | 0.4457 | 0 | 1 |
| School quality | 31,897 | 90.7559 | 6.2763 | 63.2 | 100 |
| Integration index | 31,897 | -0.7973 | 0.7846 | -3.4753 | -0.0314 |
| Failed Sale | 31,897 | 0.0078 | 0.0878 | 0 | 1 |
| Price Cut | 31,897 | 0.0146 | 0.1198 | 0 | 1 |
| Featured property | 31,897 | 0.0056 | 0.0749 | 0 | 1 |
| Culturally-focused agent | 31,897 | 0.499 | 0.5 | 0 | 1 |
| Agent productivity | 31,897 | 19.6404 | 6.6622 | 0 | 106 |
| English estate | 31,897 | 0.222 | 0.4156 | 0 | 1 |
| Undertaker estate | 31,897 | 0.1555 | 0.3623 | 0 | 1 |
| Non-plantation | 31,897 | 0.6716 | 0.4697 | 0 | 1 |
| Battle distance | 31,897 | 2.8239 | 0.8540 | -4.378 | 4.2725 |
| Castle distance | 31,897 | 0.8857 | 0.8047 | -3.3037 | 2.6967 |
| Plantation fort distance | 31,897 | 0.8383 | 0.8933 | -4.4620 | 3.1678 |
| Harbor distance | 31,897 | 2.3346 | 1.1401 | -2.0339 | 4.3933 |
| Navigable river | 31,897 | 0.0394 | 0.1945 | 0 | 1 |
| Famine intensity | 31,706 | -1.108 | 0.4095 | -5.3365 | -0.197 |
| Housing quality | 31,706 | -3.4958 | 0.9021 | -10.4459 | -2.0799 |
| Agricultural share | 31,706 | -2.5228 | 0.3491 | -3.2833 | -1.8839 |
| Manufacturing share | 31,706 | -2.5396 | 0.3175 | -3.9585 | -2.0692 |
| Land value | 31,706 | 0.3418 | 0.9426 | -2.7838 | 2.4638 |
| Population density | 31,706 | -0.2327 | 0.7518 | -3.0554 | 1.393 |
| Troubles deaths | 31,897 | -2.9777 | 6.3116 | -11.5129 | 4.8363 |
| Loyalist violence | 31,897 | 0.0509 | 0.1824 | 0 | 1 |
| Republican violence | 31,897 | 0.0542 | 0.1519 | 0 | 1 |
| Immigration (non-UK) | 31,897 | 0.0348 | 0.0777 | 0 | 2.3003 |
| Net migration (domestic) | 31,897 | 0.0037 | 0.101 | -0.5533 | 1.4265 |
| Housing stock | 31,897 | 6.7364 | 1.0594 | 0 | 7.8610 |
| Mortgage credit | 31,897 | 12.3325 | 0.6853 | 7.8779 | 13.9738 |
| Grammar schools | 31,897 | 3.7347 | 4.2771 | 0 | 15 |
| Orange halls | 31,897 | 10.7517 | 7.5502 | 0 | 35 |
| GAA clubs | 31,897 | 9.5584 | 7.7698 | 0 | 25 |
| Catholic schools | 31,897 | 3.3002 | 3.3747 | 0 | 11 |
| Protestant schools | 31,897 | 2.8954 | 2.3408 | 0 | 11 |
| Degree share | 31,897 | -1.174 | 0.3868 | -2.7169 | -0.1991 |
| Health clinics | 31,897 | -10.6566 | 3.2896 | -11.5129 | 3.7377 |
| Dentists | 31,897 | -10.4531 | 3.4687 | -11.5129 | 2.4849 |
| Libraries | 31,897 | 0.0265 | 0.1605 | 0 | 1 |
| DFI expenditure | 31,897 | -11.1416 | 2.2532 | -11.5129 | 2.9669 |
| Belfast commuting time | 31,897 | 0.8082 | 0.6391 | 0 | 1.6094 |
| For sale (%) | 3,691 | 0.9370 | 0.6815 | 0.0559 | 5.6748 |
| Sold ³⁰ (%) | 3,691 | 0.7836 | 0.5910 | 0 | 5.2147 |
| Sold ⁶⁰ (%) | 3,691 | 0.8851 | 0.6485 | 0 | 5.5215 |

Notes: This table presents summary statistics of the main dataset used in the analysis. Online Appendix Table J provides variable descriptions. All variables are measured in natural logarithms, with the exceptions below. Variables measured in levels: bedrooms, bathrooms, receptions, school grades, agent productivity, Loyalist violence, Republican violence, immigration (non-UK), net migration (domestic), mortgage credit, grammar schools, Orange Halls, GAA clubs, Catholic schools, Protestant schools. Dummy variables: rural, failed sale, price cut, featured property, segregated agent, English estate, Undertaker estate, navigable river, non-plantation.

values indicate greater multiculturalism.²² We primarily measure multiculturalism using a HHI index due to precedent in the literature (Alesina and La Ferrara, 2005; Ottaviano and Peri, 2006; Alesina et al., 2016). Similarly, we calculate 1659 multiculturalism as

$$M_n^{1659} = 1 - (British_n^2 + Irish_n^2), \quad (4)$$

where $British_n$ and $Irish_n$ are the ratio of British and Irish people to total population living in neighborhood n in the 1659 census. Online Appendix H details on how we translate the 1659 data to contemporary neighborhoods. In robustness tests we measure multiculturalism using Cutler et al. (1999)’s integration index. Online Appendix I reports how it is constructed.

4.5 Additional Variables

We merge the property-level sales data with the contemporary and historic multiculturalism variables. The 2021 census provides further demographic and socioeconomic information that is potentially relevant in explaining house prices. For each DZ, we extract the population, share of residents who are degree holders, the share of the workforce employed in each 2-digit industry, occupation, and other information. Gross value added (GVA) captures the value of goods and services produced in a neighborhood.²³ To capture the local education environment, we use annual school-level information from the Northern Ireland School Census provided by the Department of Education through Open Data NI, and the Education Authority. For each school, we observe its postcode, the religious composition of pupils, and grades.²⁴ Additional historic and contemporary variables are taken

²²A HHI measure assumes that cultures mix to a greater extent in neighborhoods with more equal population group shares. However, a neighborhood would appear perfectly diverse where both communities comprise 50% of the population, even if they reside on segregated streets. For robustness purposes, we therefore calculate the inverse of Cutler et al. (1999)’s isolation index, which we coin the integration index. Under this measure a neighborhood is more multicultural if Catholics and Protestants reside together within an area. Online Appendix I provides details.

²³To avoid measurement issues during the COVID-19 pandemic, we use the average of GVA between 2015 and 2019.

²⁴Across the UK, secondary school pupils take compulsory General Certificate in Secondary Education (GCSE) exams at age 16. Performance in these exams is crucial for determining access to post-16 education options, such as A-levels, vocational courses, or apprenticeships, and can influence university

from various sources. Online Appendix J describes each variable in the data set, its level of aggregation and source. We report summary statistics in Table 3.

5 Identification Strategy and Diagnostic Tests

The key challenge to estimating the effect of multiculturalism on house prices is that cultural composition likely correlates with other, possibly unobservable, neighborhood characteristics and amenities. However, the quasi-random settlement and displacement patterns of British colonists and Irish natives in 1659 provides a credible source of exogenous variation that can isolate causality. Figure 3 shows that the density of British (Irish) settlement in 1659 broadly overlaps with a location’s Protestant (Catholic) population share in 2021. The pairwise correlation between multiculturalism across time in a neighborhood is 0.4 and Table 4 shows a significant positive correlation between multiculturalism in 1659 and 2021. Neighborhoods that were historically more multicultural are more likely to remain so today.

To identify the multicultural housing premium/discount, we use an instrumental variables estimator. The first stage estimates

$$M_n^{2021} = \alpha_1 + \alpha_2 M_n^{1659} + \alpha_3 X_n + \varepsilon_n, \quad (5)$$

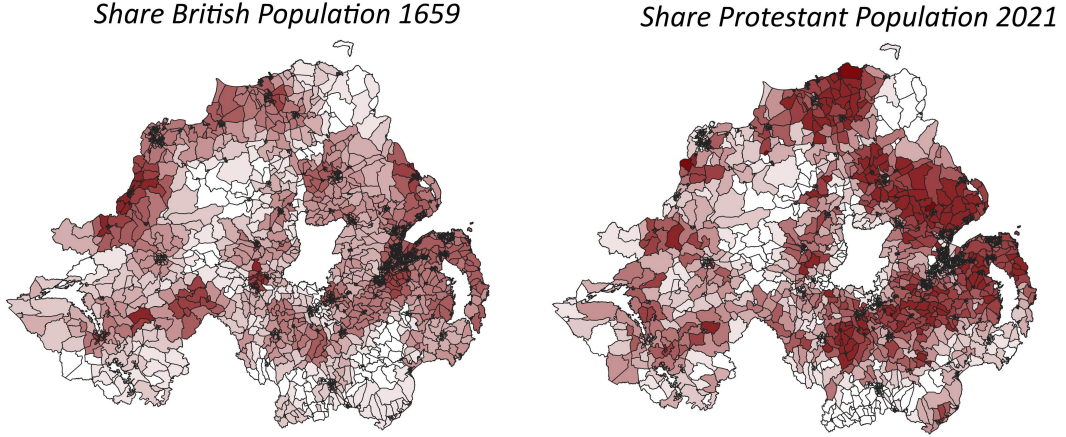
where M_n^{2021} (M_n^{1659}) is multiculturalism in 2021 (1659) in neighborhood n ; X_n is a vector of controls; ε_n is the error term. In the second stage, we estimate

$$Y_{inlt} = \beta_1 + \beta_2 \hat{M}_n^{2021} + \beta_3 X_{inlt} + \varphi_l + \varphi_t + \nu_{inat}, \quad (6)$$

where Y_{inlt} is a dependent variable (sales price, liquidity) for property i in neighborhood n located in local government district (LGD) l at month-year t ; \hat{M}_n^{2021} is the prediction of M_n^{2021} from equation (5); X_{inlt} is a vector of controls; ν_{inlt} is the error term. φ_l and

admissions, especially for competitive courses. We use the school’s share of year 12 students achieving 5 or more GCSEs at grade 4 or above to measure performance.

Figure 3: British Population Share 1659



Notes: The map on the left shows the British population share in each parish during 1659. Darker (lighter) shading indicates a higher British (Irish) share of the population. Data are taken from the Census of Ireland 1659. 2021 Datazone boundaries are superimposed for comparability. The map on the right shows the 2021 Protestant population share across 2021 census Datazones. Darker (lighter) shading indicates a higher Protestant (Catholic) population share. Data are taken from the 2021 UK Census.

φ_t denote LGD and month-year fixed effects, respectively. We use LGDs as they are geographically small units that eliminate local-level unobserved heterogeneity, and are the lowest-level of local government. φ_t purges all time-varying macroeconomic confounds.

5.1 Testing for Correlation with Observables

The key identifying assumption is that a neighborhood's religious composition in 1659 does not correlate with house prices or other housing market outcomes today, except through its influence on contemporary multiculturalism. More formally, that $Corr(M_n^{1659}, \nu_{int} = 0)$. While we cannot explicitly verify the exclusion restriction, we are able to test whether the particular variation we isolate in our IV strategy correlates with observables. To do so, we regress key contemporary property- and neighborhood-level observables on our instrument, conditioning on a minimal set of fixed effects.

Table 4 presents the results of these tests. First, the historical instrument is strongly and statistically significantly positively correlated with contemporary multiculturalism,

Table 4: Instrument Diagnostics

| Dependent variable | 1 Multiculturalism ¹⁶⁵⁹ coefficient | 2 <i>t</i> -stat | 3 LGD FE | 4 Obs | 5 <i>R</i> ² |
|---|--|---------------------|----------------|----------|----------------------------|
| <u><i>Contemporary diversity</i></u> | | | | | |
| Multiculturalism ²⁰²¹ | 0.0556*** | 3.53 | Yes | 3,660 | 0.13 |
| Integration index | 0.1028*** | 4.81 | Yes | 3,660 | 0.34 |
| <u><i>Cultural amenities</i></u> | | | | | |
| Catholic schools | 0.0516 | 1.42 | Yes | 3,660 | 0.83 |
| Protestant schools | 0.0907 | 1.57 | Yes | 3,660 | 0.68 |
| Orange halls | 0.1891 | 0.89 | Yes | 3,660 | 0.71 |
| GAA clubs | -0.1766 | -1.31 | Yes | 3,660 | 0.79 |
| <u><i>Exposure to the Troubles</i></u> | | | | | |
| Troubles deaths | -0.0016 | -1.35 | Yes | 3,660 | 0.14 |
| Loyalist violence | 0.0005 | 0.23 | Yes | 3,660 | 0.03 |
| Republican violence | -0.0039 | -0.67 | Yes | 3,660 | 0.09 |
| <u><i>Macro conditions</i></u> | | | | | |
| Population | -0.0040 | -0.68 | Yes | 3,660 | 0.04 |
| GVA | -0.0279 | -1.34 | Yes | 3,660 | 0.07 |
| Household deprivation | 0.0133 | 0.68 | Yes | 3,660 | 0.12 |
| Unemployment | -0.0015 | -1.06 | Yes | 3,660 | 0.13 |
| Health deprivation | 0.0011 | 0.78 | Yes | 3,660 | 0.08 |
| Housing deprivation | -0.0008 | -0.48 | Yes | 3,660 | 0.16 |
| <u><i>Public goods</i></u> | | | | | |
| DFI spending | -0.0000 | -0.52 | Yes | 3,660 | 0.01 |
| <u><i>Migration</i></u> | | | | | |
| Immigration (non-UK) | 0.0003 | 0.38 | Yes | 3,660 | 0.05 |
| Net migration (domestic) | 0.0002 | 0.13 | Yes | 3,660 | 0.01 |
| <u><i>Education & occupations</i></u> | | | | | |
| School quality | 0.0008 | 0.48 | Yes | 3,660 | 0.12 |
| Degree (%) | 0.0052 | 0.73 | Yes | 3,660 | 0.04 |
| Unemployment | -0.0015 | -1.06 | Yes | 3,660 | 0.13 |
| Routine job | -0.0021 | -0.34 | Yes | 3,660 | 0.07 |
| Technical & supervisory | -0.0085 | -1.05 | Yes | 3,660 | 0.12 |
| Upper management & professional | 0.0092 | 0.70 | Yes | 3,660 | 0.05 |
| <u><i>Housing market</i></u> | | | | | |
| Housing stock | -0.0019 | -0.37 | Yes | 3,660 | 0.04 |
| Detached houses | -0.0022 | -0.44 | Yes | 3,660 | 0.07 |
| Semi-detached houses | -0.0061 | -1.34 | Yes | 3,660 | 0.02 |
| Mortgage credit | 0.0180 | 1.49 | Yes | 3,660 | 0.28 |

Notes: This table presents estimates of the equation $Y_n = \alpha + \beta M_n^{1659} + \varphi_l + \varepsilon_n$, where Y_n is an outcome variable in neighborhood n in LGD area l during the sample period; M_n^{1659} is the (ln) 1659 HHI variable; φ_l denotes local government district fixed effects; ε_n is the error term. Variable definitions are shown in Table 8.J. We cluster the standard errors by parish and report the corresponding t -statistics in parentheses. *** denotes statistical significance at the 1% level.

suggesting a valid first stage and a significant reduced-form effect of our instrument on multiculturalism. However, we see no evidence of significant correlations between the instrument and any observable contemporary neighborhood-level characteristics. Historic multiculturalism is unrelated to the presence of cultural amenities, exposure to the Troubles, neighborhoods’ population and gross value added, public goods availability, household deprivation, unemployment, migration, the quality of schools, unemployment and the occupations of people living in a neighborhood.²⁵ The instrument also does not predict a neighborhood’s housing stock, the composition of its properties or mortgage credit availability. Together, the evidence points towards the instrument being valid as it does not predict a neighborhood’s post-colonial economic trajectory.

5.2 Settlement Patterns

The institutional setting also speaks to the instrument’s exogeneity. Pre-1609 there was no English presence in Ulster, trade links were minimal, and the English Crown did not have a map of the province until 1656.²⁶ Colonization was thus undertaken without knowledge of local topography or agricultural conditions, and estates were assigned by decision makers in London without understanding of the region. The religious composition of settlements also hinged on famines in England and Scotland. Moreover, the area available for colonization was restricted to the confiscated landholdings of the O’Neill and O’Donnell clans, whose borders were determined by pre-colonization conflicts among native chiefdoms.

Each factor made it difficult for decision makers to choose estate locations with economically advantageous features, such that settlement locations are unlikely to systematically

²⁵The Troubles was a conflict in Northern Ireland about the region’s sovereignty from the late 1960s until 1998 between Unionist/Loyalist (overwhelmingly Protestant) and Nationalist/Republican (overwhelmingly Catholic) paramilitary groups. 3,532 people died during the conflict. The Northern Ireland peace process led to paramilitary ceasefires and talks between the main political parties, which resulted in the Good Friday Agreement of 1998 that restored peace and self-government to Northern Ireland.

²⁶Gardiner and McNeill (2016) note, ‘As tension increased in Ireland during the later sixteenth century, the demand for land maps grew; it was boosted by the success of Robert Lythe, the first cartographer to spend a long time in the country and to carry out a serious programme of land survey. The information was limited to where English agents could move and record, which excluded the Gaelic north: “it was in the Irishry of northern and north-western Ireland that cartography lagged furthest behind contemporary written sources.”’ Merchant trade records report no pre-1609 trade between Ulster and England. See <https://www.nationalarchives.gov.uk/help-with-your-research/research-guides/merchant-trade-records-port-books-1565-1799/> for details.

Table 5: Settlement Patterns

| Dependent variable | 1 Settlers / acre | 2 Irish / acre | 3 Multiculturalism ¹⁶⁵⁹ |
|---------------------|----------------------|--------------------|---------------------------------------|
| Barley productivity | 0.0008 (0.81) | 0.0005 (0.84) | 0.0007 (1.21) |
| Potato productivity | -0.0016 (-0.48) | -0.0001 (-0.06) | -0.0018 (-0.98) |
| Rye productivity | 0.0013 (1.11) | -0.0001 (-0.12) | 0.0007 (0.97) |
| Castle | 0.5117 (1.03) | 0.3165 (1.42) | 0.3786 (1.55) |
| Harbor distance | -0.0551 (-0.81) | -0.0217 (-0.44) | 0.0214 (0.56) |
| Battle distance | 0.0363 (0.28) | -0.0291 (-0.74) | 0.0209 (0.26) |
| Barony FE | Yes | Yes | Yes |
| Observations | 277 | 277 | 277 |
| R^2 | 0.30 | 0.38 | 0.23 |

Notes: This table reports estimates of equation (7). Variable descriptions are reported in Online Appendix Table J. The standard errors are clustered by barony and the corresponding t -statistics are reported in parentheses. ** indicates statistical significance at the 5% level.

correlate with local economic conditions that persist until today. To provide more formal insights, we correlate settlement and cultural diversity patterns in 1659 with measures of infrastructure and agricultural productivity that predate the Plantation that could plausibly influence colonization decisions and contemporary economic outcomes. We estimate

$$y_{pb} = \alpha + \beta X_{pb} + \gamma_b + \varepsilon_{pb}, \quad (7)$$

where y_{pb} is an outcome variable (British inhabitants per acre, Irish inhabitants per acre, multiculturalism¹⁶⁵⁹) in parish p of barony b in 1659; X_{pb} is a vector containing agricultural productivity for various crops, an indicator of whether the parish contains a pre-1609 castle and distances to the nearest historical harbor and Nine Years' War battlefield; γ_b denotes barony fixed effects; ε_{pb} is the error term.²⁷

²⁷We use the Calorific Suitability Index developed by Galor and Özak (2016), which uses FAO-GAEZ field-level data that measures the productivity of crops without fertilizer and under rain-fed conditions. This measure is widely used to approximate pre-industrial agricultural productivity (Costinot et al., 2016). We aggregate the field-level (areas measuring 10 km²) data to the parish level. Clarkson and Crawford (2016) report that the staple foods in Ireland prior to colonization were grains (barley and rye) and that potatoes were introduced during the early 1600s. We include the distance to a Nine Years' Battlefield to account for potential learning during military campaigns.

Throughout Table 5, we find no significant associations between any of the agricultural productivity variables, military infrastructure, proximity to harbors or Nine Years' War Battlefields and the number of settlers or Irish natives per acre, or multiculturalism in 1659. In essence, neither British colonists nor Irish natives chose settlement locations with economically advantageous characteristics, making it unlikely that the instrument correlates with historical factors that have an enduring effect on housing markets. Together, the evidence in this section strongly supports the relevance and validity of our instrumental variable approach.

6 The Effects of Multiculturalism on House Prices

Panel A in Table 6 reports OLS estimates of equation (6) using log sales price as the dependent variable. The multicultural price elasticity in column 1 is 0.0297 and significant at the 1% level. Property prices are thus higher in more multicultural neighborhoods. Among the control variables, we find that houses with more bedrooms, bathrooms, and receptions that are located in areas with larger populations and higher gross value added sell for significantly higher prices. School quality is significantly positively associated with property values whereas there is little difference in prices between rural and urban locations.

To hone in on causal inferences, we turn to instrumental variables estimation in column 2. The second-stage estimate of the local average treatment effect (LATE) is larger relative to the OLS effect size and significant at the 1% level. Economically, a standard deviation increase in multiculturalism equates to a 9.6% higher sales price, or £10,385 for the average property in the data set, suggesting cultural composition is a meaningful determinant of property values. The positive relationship is consistent with the model's prediction that properties sell for higher prices in heterogeneous neighborhoods because there exists greater housing demand. This mechanism also provides an explanation for why the OLS estimates are downward biased. If multiculturalism is positively correlated with demand

Table 6: Multiculturalism and House Prices

| Estimator | 1 OLS | 2 | 3 | 4 IV | 5 |
|---------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Level of aggregation | | Property | | | Neighborhood |
| Dependent variable: Sale price | | | | | |
| Panel A: OLS and second-stage results | | | | | |
| Multiculturalism ²⁰²¹ | 0.0297*** (4.78) | 0.1959*** (2.87) | 0.1927*** (3.21) | | 0.2339*** (3.43) |
| Bedrooms | 0.1280*** (31.17) | 0.1310*** (30.19) | 0.1309*** (30.40) | 0.1310*** (30.50) | 0.1322*** (27.19) |
| Bathrooms | 0.1259*** (30.49) | 0.1242*** (28.61) | 0.1243*** (28.76) | 0.1262*** (29.69) | 0.1256*** (29.03) |
| Receptions | 0.1116*** (32.99) | 0.1073*** (27.60) | 0.1073*** (28.32) | 0.1081*** (29.59) | 0.1088*** (24.29) |
| Population | 0.0629*** (4.72) | 0.0838*** (5.01) | 0.0834*** (5.14) | 0.0779*** (5.22) | 0.0841*** (5.20) |
| GVA | 0.0179*** (5.57) | 0.0078 (1.47) | 0.0080 (1.62) | 0.0166*** (4.75) | 0.0061 (1.14) |
| Rural | 0.0071 (0.89) | 0.0209** (2.04) | 0.0206** (2.07) | -0.0050 (-0.57) | 0.0267*** (2.64) |
| School quality | 0.0016*** (2.64) | 0.0006 (0.77) | 0.0006 (0.83) | 0.0015** (2.34) | 0.0003 (0.44) |
| Integration index | | | | 0.0872*** (3.20) | |
| Local government district FE | Yes | Yes | Yes | Yes | Yes |
| Property type FE | Yes | Yes | Yes | Yes | Yes |
| Month \times Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 31,897 | 31,897 | 31,897 | 31,897 | 24,327 |
| MOP weak-ID F-stat | | 31.25 | 17.25 | 160.59 | 30.94 |
| 10% critical value | | 23 | 6 | 23 | 23 |
| 95% AR confidence interval | | [.08, .35] | [.07, .38] | [.04, .14] | [.12, .40] |
| Hansen J-stat p-value | | | 0.91 | | |
| Panel B: First-stage results | | | | | |
| Multiculturalism ¹⁶⁵⁹ | | 0.0545*** (5.59) | 0.0546*** (5.70) | 0.1225*** (12.67) | 0.0520*** (5.56) |
| Servitor | | | -0.1373** (-2.32) | | |

Notes: Panel A presents estimates of equation (6). Variable definitions are shown in Table 8.J. Panel B presents estimates of equation (5). In column 5 all variables are averaged by neighborhood-month-year and we calculate the mean neighborhood-month-year share of each property type and use these variables in place of the property type fixed effects. Standard errors are clustered by neighborhood (data zone) and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

shocks in the error term, OLS will underestimate the premium.²⁸

Diagnostic tests indicate the historical instrument is relevant. First-stage estimates in Panel B show neighborhoods that were more multicultural in 1659 remain so today. The historic coefficient estimate is significant at 1%. Furthermore, the Montiel Olea-Pflüger (MOP) F-statistic is 31.25 which comfortably exceeds the 10% critical value (23) while the LATE also lies within the 95% Anderson-Rubin confidence interval. Each piece of evidence thus suggests colonization had an enduring influence on residential composition.

The second diagnostic check focuses on instrument validity. We estimate an overidentified model in which we use a Servitor dummy variable that equals 1 if a Plantation settlement was overseen by a Servitor, 0 otherwise. As military veterans, Servitors typically did not have British estates from which they could draw settlers and were thus allowed an unlimited number of Irish tenants. Servitor areas thus tend to be less multicultural, both historically and today, satisfying the relevance condition.²⁹ Furthermore, the lands allocated to Servitors appears plausibly random: the data show no significant differences in the characteristics of these areas and other types of colonists.

Column 3 presents the overidentified model estimates. Despite the change in the instrument set, the economic magnitude of the LATE is almost identical to the baseline estimate (0.1927) and is significant. The signs of the instrumental variables coefficient estimates in Panel B are consistent with the intuition above: multicultural areas in 1659 continue to remain more diverse today whereas neighborhoods assigned to Servitors are 12.83% less heterogeneous.³⁰ Both coefficient estimates are significant, and collectively the instrument set passes the MOP weak identification test. The p-value of the Hansen J-stat is 0.91. While this does not provide definitive evidence that the exclusion restriction holds, there is no strong evidence against instrument validity.

Measuring multiculturalism using a HHI approach assumes greater mixing between

²⁸An alternate explanation for the difference in magnitude between the OLS and IV parameter estimates is that property prices differ between segregated Catholic and Protestant neighborhoods. Online Appendix Table 3.A shows this is not the case.

²⁹The average 1659 Irish population share in servitor (non-servitor) parishes was 64.9% (48.6%). This difference is significant at the 1% level (t-stat = 8.37). The average 2021 Catholic population share in servitor areas is 61.8% (43.2%). The difference is significant at the 1% level (t-stat = 5.92).

³⁰The effect size is $(e^{-0.1373} - 1) \times 100\% = 12.83\%$

groups in neighborhoods where they have similar population shares. However, a neighborhood will appear completely diverse where the two groups have equal population shares, even if they live on perfectly segregated streets. To validate the inferences, we instead use the integration index, which provides insights into how geographically intertwined communities are within an area. Estimates in column 4 continue to show that house prices are significantly higher in multicultural areas. While the integration index’s parameter estimate is smaller relative to the equivalent HHI specification, it implies that increasing multiculturalism by a standard deviation raises prices by 6.8% which is comparable to the baseline instrumental variable estimate.

Finally, column 5 reports neighborhood-level estimates to evaluate whether the statistical significance in the previous columns reflects a large number of observations. We find a similar pattern of evidence and the second-stage multicultural parameter is comparable in economic and statistical magnitude to the baseline results.

6.1 Transmission Mechanisms

In this section, we test how the effect of multiculturalism transmits to property values. First, we show that demand and market liquidity varies according to neighborhood heterogeneity. We then demonstrate that residential composition, rather than cultural amenities, matters for prices and show evidence that properties in multicultural neighborhoods attract buyers from a wider spectrum of society.

We approximate demand using the number of unique daily viewers a property listing attracts. Intuitively, if multiculturalism raises demand, properties in more heterogeneous neighborhoods should attract a greater number of potential buyers, resulting in a higher number of unique viewers. Column 1 in Table 7 shows that among sold properties a 10% increase in multiculturalism raises the number of unique daily viewers by 7.04%. In column 2, we consider all listings during the sample period, that is, irrespective of whether a sale is agreed. The effect size equates to a 2.50% increase in views for a 10% increase in multiculturalism. The weaker effect is consistent with unsold properties garnering fewer

potential buyers, which attenuates the multiculturalism parameter.³¹

Table 7: Transmission Channels

| Channel | 1 | 2 | 3 | 4 | 5 | 6 |
|----------------------------------|---------------------|---------------------|------------------------|------------------------|---------------------|----------------------|
| | Demand | | Liquidity | | Amenities | |
| Dependent variable | Views | | Sold ³⁰ (%) | Sold ⁶⁰ (%) | Price | |
| Panel A: second-stage results | | | | | | |
| Multiculturalism ²⁰²¹ | 0.7035*** (2.73) | 0.2501* (1.85) | 0.6482*** (2.92) | 0.7501*** (2.99) | 0.1644** (2.35) | 0.1259** (1.97) |
| Catholic schools | | | | | 0.0010 (0.27) | -0.0015 (-0.47) |
| Protestant schools | | | | | 0.0092*** (3.27) | 0.0071*** (2.83) |
| GAA clubs | | | | | -0.0016 (-0.99) | -0.0009 (-0.69) |
| Orange halls | | | | | 0.0023** (2.33) | 0.0021** (2.52) |
| Degree share | | | | | | 0.3065*** (18.06) |
| Health clinics | | | | | | -0.0010 (-0.86) |
| Dentists | | | | | | 0.0002 (0.15) |
| Libraries | | | | | | 0.0557* (1.72) |
| DFI expenditure | | | | | | 0.0012 (0.87) |
| Belfast commuting time | | | | | | 0.0128 (0.83) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes |
| Local government district FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Property type FE | Yes | Yes | No | No | Yes | Yes |
| Month \times Year FE | Yes | Yes | No | No | Yes | Yes |
| Observations | 2,311 | 8,184 | 3,691 | 3,691 | 31,897 | 31,897 |
| MOP weak-ID F-stat | 8.093 | 25.480 | 35.05 | 23.193 | 28.201 | 25.488 |
| 10% critical value | 23 | 23 | 23 | 23 | 23 | 23 |
| 95% AR confidence interval | [.07, .31] | [.07, .31] | [.21, 1.29] | [.28, 1.20] | [.05, .40] | [.02, .27] |
| Panel B: first-stage results | | | | | | |
| Multiculturalism ¹⁶⁵⁹ | 0.0579*** (5.77) | 0.0579*** (5.77) | 0.0394*** (4.82) | 0.0394*** (4.82) | 0.0452*** (4.72) | 0.0500*** (5.05) |

Notes: Panel A presents estimates of equation (6). Variable definitions are shown in Table 8.J. The unreported control variables are bedrooms, bathrooms, receptions, population, GVA, rural, and school quality. Panel B presents estimates of equation (5). Standard errors are clustered by neighborhood (data zone), and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

When more buyers are willing to purchase an asset, it becomes more liquid, resulting in higher market prices (Fontaine and Garcia, 2012; Nagel, 2016). We therefore ask whether multicultural neighborhoods are more liquid markets across columns 3 and 4 of the table. A consistent pattern of results emerges. Increasing multiculturalism by 10% significantly raises the the probability that a property is sold within 30 and 60 days of listing by 6.48%

³¹Daily viewer statistics only became available during the sample period, which is why there are fewer observations than in Table 6.

and 7.50%, respectively.³²

Alternatively, properties may obtain higher prices in multicultural neighborhoods because both Catholic- and Protestant-specific cultural amenities are concentrated there, such that cultural amenities rather than residential composition drives demand (Wong, 2013). Northern Ireland’s key cultural amenities are schools and organizations that promote British or Irish identity. We therefore saturate equation (6) with variables measuring the number of Catholic and Protestant secondary schools, Orange halls, and GAA clubs within a 10 kilometer radius of each neighborhood. In column 5, we find that the number of Protestant schools and Orange halls are positively associated with house prices, but Catholic amenities have no significant effect. Importantly, while cultural amenities matter for property values, they the multicultural price premium endures.

A related potential explanation is that heterogeneous neighborhoods are endowed with superior non-cultural amenities for which all groups have a taste. Households may choose where to live according to residents’ educational profile, access to healthcare and education services, public goods provision, and commuting times. Column 6 shows prices are significantly higher in neighborhoods where a larger share of the population have a degree and with better access to libraries. However, the remaining amenities’ coefficient estimates are insignificant and cultural composition continues to exert a significantly positive effect on house prices. It appears that multiculturalism itself matters, and the effect we detect is not entirely driven by amenities.

6.2 Title Deeds Analysis

Our proposed demand channel implies greater heterogeneity in the composition of transacting parties in multicultural neighborhoods, and a concentration of within-group sales in segregated ones. In essence, the multicultural premium reflects a greater number of potential property buyers in these neighborhoods. To test this conjecture, we estimate

$$y_{pnl} = \alpha + \beta M_n^{2021} + \gamma X_{pnl} + \varphi_l + \varphi_t + \varepsilon_{pnl}, \quad (8)$$

³²Head and Lloyd-Ellis (2012) use days on the market to measure housing market liquidity.

where $y_{hnl t}$ is an outcome variable for property p in neighborhood n of LGD l sold in month-year t ; all other variables are defined as previously.

To test whether intercultural transactions are more prevalent in multicultural areas, we estimate equation (8) using *Inter* (*Intra*) which equals 1 if transacting parties are from different (the same) cultural backgrounds (Catholic to Protestant or vice versa), and 0 otherwise. Column 1 in Table 8 shows a significantly higher probability of an intercultural transaction in multicultural neighborhoods. A standard deviation increase in cultural diversity raises the probability of an inter-group transaction by 1.21 percentage points, or 16% relative to the mean. Consistently, the estimates in column 2 indicate a significantly lower probability of an intra-culture transaction in more heterogeneous neighborhoods. A standard deviation increase in multiculturalism reduces the probability of a within-group transaction by 5.24 percentage points, or 35%. Both pieces of evidence suggest that properties in multicultural neighborhoods attract more potential buyers by appealing to a wider cross-section of society.

Table 8: Title Deeds Evidence

| Dependent variable | 1 Inter | 2 Intra | 3 | 4 | 5 Price | 6 | 7 | 8 |
|----------------------------------|--------------------|-----------------------|------------------|---------------------------|------------------------|------------------|------------------|---------------------|
| Neighborhood | | All | | $M^{2021} \leq \bar{\mu}$ | $M^{2021} > \bar{\mu}$ | SC | SP | All |
| Multiculturalism ²⁰²¹ | 0.0258** (2.22) | -0.1144*** (-5.54) | | | | | | 0.1206*** (3.34) |
| Price | 0.0007 (0.07) | -0.0019 (-0.14) | | | | | | |
| Inter | | | 0.0036 (0.10) | 0.0069 (0.11) | 0.0220 (0.49) | 0.0174 (0.09) | 0.1412 (0.92) | |
| LGD FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| Month \times Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property FE | No | No | No | No | No | No | No | Yes |
| Observations | 3,054 | 3,054 | 3,054 | 1,525 | 1,529 | 320 | 172 | 3,054 |
| R^2 | 0.12 | 0.14 | 0.60 | 0.58 | 0.65 | 0.43 | 0.59 | 0.42 |

Notes: The table presents estimates of equation 8. In column 1, the dependent variable equals 1 if the transacting parties are Catholic and Protestant, 0 otherwise. In column 2, the dependent variable equals 1 if the transacting parties are either both Catholic or both Protestant, 0 otherwise. In columns 3 to 7 the dependent variable is the natural logarithm of the sales price. $\bar{\mu}$ denotes the mean of neighborhood multiculturalism in the sample. The sample in column 6 (7) contains segregated Catholic (Protestant) neighborhoods where at least 80% of the population is from that religious background. Variable definitions are shown in Table 8.J. We cluster the standard errors by neighborhood and report the corresponding t -statistics in parentheses. *, **, *** denotes statistical significance at the 10%, 5% and 1% level respectively.

Title deeds also provide a window into whether the multicultural premium reflects

discrimination or other forces including incomplete search within social networks. For example, if parties discriminate by demanding higher prices from purchasers from the other culture, properties in multicultural neighborhoods would sell for systematically higher prices because there are more inter-cultural exchanges. Across column 3 to 7 of the table, we find this is not the case. Indeed, we find no significant price premium/discount for inter-cultural transactions irrespective of whether a property is located in a less or more multicultural neighborhood (columns 4 and 5) or segregated Catholic and Protestant neighborhoods (columns 6 and 7). Overall, the title deeds evidence suggests the multicultural price premium reflects greater demand from a broader cross-section of society rather than discrimination or other forces.³³

As a validation check, we leverage the panel structure of the title deeds to ascertain whether changes in neighborhoods' multiculturalism translate into higher property prices. Column 8 presents estimates from a model including property fixed effects to purge all property-level unobserved heterogeneity. The multiculturalism parameter is positive and significant. A standard deviation increase in multiculturalism raises sold prices by 7.69% which is consistent with the baseline effect size, despite the smaller sample.

7 Extensions and Robustness Tests

Next, we undertake a series of sensitivity checks to ascertain whether the findings generalize, and then rule out contemporary and historical confounds.

7.1 External Validity and Instrument Falsification Tests

Although the Northern Irish economic laboratory has several econometric advantages, it is natural to ask whether the findings generalize to other contexts. We can examine external validity since two counties in the Republic of Ireland (Donegal and Monaghan) were also colonized which provides a testing ground outside Northern Ireland's institutional

³³The institutional architecture of Northern Ireland's real estate market means transacting parties are frequently unaware of a counter party's name or identity until after a sales price has been agreed whereupon contracts are exchanged. This limits the extent to which discrimination can influence pricing decisions.

framework.³⁴

Table 9: External Validity and Falsification Tests

| Estimator | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------|---------------------|---------------------|---------------------|----------------------------------|--------------------|
| | IV | | | OLS | |
| Aggregation level | Property | | | Small area | |
| Dependent variable | Price | | | Multiculturalism ²⁰²² | Catholic share |
| Panel A: Second-stage and OLS results | | | | | |
| Multiculturalism ²⁰²² | 0.3012*** (2.94) | 0.2109*** (2.60) | 0.2190*** (2.76) | | |
| Population | | 0.2499*** (5.68) | 0.2502*** (5.81) | | |
| Newbuilt | | 0.7035*** (6.93) | 0.7188*** (7.00) | | |
| Colonized | | | | 0.0047 (1.00) | -0.0038 (-0.82) |
| County FE | No | Yes | No | No | No |
| Property Type FE | No | Yes | Yes | No | No |
| Month × Year FE | No | Yes | No | No | No |
| Month × Year × County FE | No | No | Yes | No | No |
| Observations | 17,194 | 17,194 | 17,194 | 3,550 | 3,550 |
| R ² | - | - | - | 0.01 | 0.01 |
| MOP weak-ID F-stat | 84.53 | 92.47 | 91.48 | - | - |
| 10% critical value | 23 | 23 | 23 | - | - |
| 95% AR Confidence Interval | [.11, .51] | [.07, .38] | [.09, .38] | - | - |
| Panel B: First-stage results | | | | | |
| Multiculturalism ¹⁶⁵⁹ | 0.0270*** (9.19) | 0.0280*** (9.62) | 0.0278*** (9.57) | - - | - - |

Notes: We use property-level data for Donegal and Monaghan in columns 1 to 3. Panel A presents estimates of equation (6). The dependent variable is the natural logarithm of sales price (in Euros). Multiculturalism²⁰²² is the natural logarithm of 1 minus the religious HHI in the property's 2022 census small area; Population is the natural logarithm of the population living in the census small area; Newbuilt is a dummy variable equal to 1 if a property is a newbuild, 0 otherwise. We use small area-level data for Munster from the 2022 census in columns 4 and 5. Plantation is a dummy variable equal to 1 if a small area lies within the Munster Plantation (the counties of Cork, Kerry, Limerick, and west Waterford) and 0 in contiguous counties (Clare, Tipperary, east Waterford). The dependent variable in column 4 (5) is Multiculturalism²⁰²² (the Catholic population share). Standard errors are clustered by neighborhood (small area) and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A of Table 9 reports second-stage estimates of equation (6) using the property-level data set for Donegal and Monaghan. Column 1 shows an unconditional specification in which the multicultural parameter estimate is positive and significant. In the Republic of Ireland, the most similar unit of local government administration to a LGD is a county. We therefore append the model with county, property type, and month-year fixed effects

³⁴We are unable to include observations from Cavan, the third county of Ulster now located in the Republic of Ireland, in this test because it does not have a 1659 census return. The Introduction to the 1659 Census suggests information is missing because poll collectors embezzled collected proceeds and did not report to the Crown.

to most closely approximate the estimation environment in the baseline tests, and control for neighborhood population and whether a property is a new build. In column 2, the LATE is 0.2109 and significant, while it is almost unchanged in column 3 when including county-month-year fixed effects in the specification to ensure the panel structure of the data does not drive the inferences.

Despite the change in economic laboratory, the inferences endure. Moreover, the estimates imply that a standard deviation increase in multiculturalism raises house prices by 8.39% which is remarkably similar to the baseline effect. This setting also offers a window into instrument relevance. Across all specifications in Panel B, the instrument is individually significant, and the MOP F-statistics indicate that instrument relevance holds.

Identification in the econometric model flows from historic settlement patterns. Falsification tests provide insights into whether colonization is relevant in determining contemporary multiculturalism rather than another force. During the 1580s the English Crown confiscated land in Munster, a province in the Republic of Ireland, and colonized the area with British settlers.³⁵ This colonization attempt ultimately failed to establish a British presence as settlers fled the area in the face of a local rebellion in 1598. This allows us to test whether historically colonized lands are more multicultural today because of the persistence of the transplanted population or other factors. Using the religious composition of each small area in the 2022 Irish census, we estimate

$$Y_n^{2021} = \alpha + \beta \text{Colonized}_n + \varepsilon_n, \quad (9)$$

where Y_n^{2021} is either the contemporary Multiculturalism variable or Catholic population share in small area n ; Colonized_n is a dummy variable equal to 1 if a small area lies within the Munster Plantation (Cork, Kerry, Limerick, and west Waterford) and 0 in contiguous non-colonized counties (Clare, Tipperary, east Waterford).

Columns 4 and 5 of Table 9 report estimates of equation (9), showing that the colonized

³⁵Land was seized from the Desmond clan following a series of rebellions to maintain independent rule.

coefficient estimate is close to zero and insignificant. Destruction of British settlements in Munster resulted in a religiously homogenous society today, unlike in colonized areas of Ulster. It thus appears plausible that the Ulster Plantation is the key driver of multiculturalism today and that the instrument set is relevant.

7.2 Contracting Frictions

In the UK, transacting parties may withdraw from a house sale at any point before both parties sign a contract.³⁶ An alternate hypothesis for the multicultural premium could be that contracting frictions are less severe in these areas. The data allow us to test this proposition as we can observe if a sold property’s status changes from ‘sold STC’ to ‘for sale’, indicating breakdown of a sale. Column 1 in Table 10 shows no evidence that the probability of contracting frictions differs according to cultural diversity.

The segregation discount could reflect negative neighborhood-level externalities that limit liquidity and lead vendors to accept greater haircuts to sell their assets, or systematic mispricing. Real estate agents may market properties to different intensities depending on a location’s cultural composition. Columns 2 and 3 show no significant relationships between multiculturalism and the probability that a seller cuts the sales price, or whether a property has a featured listing.

Housing markets frequently exhibit costly search frictions that cultural social networks may alleviate. In a segmented housing market, vendors may rely on real estate agents who specialize in a single cultural group and use their social networks to increase within-group transactions, resulting in lower prices due to incomplete search effort (Agarwal et al., 2019). The multicultural premium could thus reflect social network discounts, which are more pronounced in segregated neighborhoods. Using the geography of agents’ listings, we calculate the average Protestant population share of their listings’ neighborhoods and designate a culturally-focused agent as one whose average Protestant population share lies

³⁶After a buyer’s offer is accepted, a house is sold STC. This is only an informal agreement to buy/sell the house and is not enforceable in law. The conveyancing process typically takes at least three months to complete before the parties sign a contract. Property sales may thus fall through during the interim period simply because the buyer, and/or seller, decide not to proceed with the deal. The legally binding contract is typically signed on the day of, or a few days before, the legal transfer of ownership.

Table 10: Contracting Frictions and Real Estate Market Tests

| Estimator | (1) | (2) | (3) | (4) | (5) |
|----------------------------------|----------------------|-----------------------|---------------------|----------------------|----------------------|
| Dependent variable | Failed sale | Price cut | Featured | Sale price | |
| Panel A: Second-stage results | | | | | |
| Multiculturalism ²⁰²¹ | -0.0033 (-0.24) | 0.0115 (1.23) | -0.0058 (-0.44) | 0.2184*** (2.73) | 0.1959*** (2.86) |
| Bedrooms | -0.0009 (-1.21) | -0.0010 (-0.98) | -0.0001 (-0.23) | 0.1318*** (29.43) | 0.1310*** (30.19) |
| Bathrooms | 0.0001 (0.21) | 0.0001 (0.08) | 0.0002 (0.33) | 0.1233*** (27.43) | 0.1242*** (28.61) |
| Receptions | -0.0003 (-0.36) | 0.0018 (1.53) | 0.0006 (0.66) | 0.1069*** (26.82) | 0.1073*** (27.63) |
| Population | -0.0022 (-0.81) | -0.0019 (-0.66) | -0.0002 (-0.09) | 0.0858*** (4.93) | 0.0838*** (5.01) |
| GVA | -0.0000 (-0.05) | -0.0026*** (-2.96) | 0.0002 (0.18) | 0.0069 (1.19) | 0.0079 (1.47) |
| Rural | -0.0035** (-2.29) | -0.0055*** (-3.06) | -0.0025* (-1.76) | 0.0226** (2.10) | 0.0209** (2.04) |
| School quality | 0.0000 (0.03) | -0.0001 (-0.52) | -0.0001 (-1.19) | 0.0007 (0.93) | 0.0006 (0.76) |
| Culturally-focused agent | | | | 0.0404** (2.03) | |
| Agent productivity | | | | | -0.0001 (-0.20) |
| Local government district FE | Yes | Yes | Yes | Yes | Yes |
| Property type FE | Yes | Yes | Yes | Yes | Yes |
| Month × Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 31,897 | 31,897 | 31,897 | 31,897 | 31,897 |
| MOP weak-ID F-stat | 31.25 | 31.25 | 31.25 | 25.12 | 31.10 |
| 10% critical value | 23 | 23 | 23 | 23 | 23 |
| 95% AR confidence interval | [.08, .35] | [.08, .35] | [.08, .35] | [.08, .42] | [.08, .35] |
| Panel B: First-stage results | | | | | |
| Multiculturalism ¹⁶⁵⁹ | 0.0545*** (5.59) | 0.0545*** (5.59) | 0.0545*** (5.59) | 0.0473*** (5.01) | 0.0544*** (5.58) |

Notes: This table presents estimates of equation (6). Variable definitions are shown in Table 8.J. Standard errors are clustered by neighborhood (data zone), and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

either below the 25th or above the 75th percentile. Contrary to the conjecture, in column 4, we find culturally-focused agents sell properties for a significant 4.12% premium while the LATE remains robust. Finally, column 5 shows that the findings are not driven by real estate agents' productivity.

7.3 Sensitivity Checks

The principal threat to identification in our setting are historical factors that simultaneously correlate with the instrument and influence neighborhoods' economic trajectory over the long run. It is not clear what these confounds might be, and the earlier diagnostic tests suggest the instrument is plausibly randomly assigned. Nevertheless, in this section we examine the most likely historical influences.

We begin by excluding observations from county Tyrone to ensure the findings do not reflect the imputation procedure we use in the absence of 1659 census data. The estimates in column 1 of Table 11 are robust.

Next, we consider colonization-specific attributes that vary across space. Unlike in the rest of the colonized lands, the London Corporation was tasked with settling county Derry/Londonderry. As a powerful financial and commercial institution, controlling trade and overseeing London's guilds and livery companies, it potentially had greater financial resources and trade linkages than Undertakers and Servitors, which may have a lasting economic impact through its settlements. Relatedly, English colonists may have imported new technologies, or estates overseen by Undertakers were more successful due to their greater wealth compared to Servitors and native grantees. Non-colonized areas may evolve differently if they have inferior ex-ante natural endowments. The British Crown may have learned about local conditions from military campaigns during the Nine Years' War and used this information to choose superior settlement sites. Across columns 3 to 5 of Table 11, we find the inferences are robust to these considerations.

Settlement may be more intensive around military infrastructure that predates the Plantation due to its defensive purposes, while the security it provides may also provoke

Table 11: Historical Robustness Tests

| Sample | 1 Ex-Tyrone | 2 Ex-Derry/ L'Derry | 3 | 4 | 5 All | 6 | 7 |
|----------------------------------|--------------------|---------------------------|----------------------|--------------------|---------------------|-----------------------|-----------------------|
| Dependent variable: Sale price | | | | | | | |
| Multiculturalism ²⁰²¹ | 0.1477** (2.04) | 0.1470** (2.39) | 0.1689** (2.22) | 0.1738** (2.20) | 0.1944*** (2.78) | 0.2181*** (2.77) | 0.1974*** (2.88) |
| English estate | | | 0.0164 (1.28) | | | | |
| Undertaker estate | | | -0.0481** (-2.46) | | | | |
| Non-plantation | | | | 0.0292 (1.26) | | | |
| Battle distance | | | | | 0.0013 (0.28) | | |
| Castle distance | | | | | | -0.0049 (-0.90) | |
| Plantation fort distance | | | | | | 0.0152** (2.23) | |
| Harbor distance | | | | | | -0.0365*** (-4.61) | |
| Navigable river | | | | | | 0.0054 (0.17) | |
| Famine intensity | | | | | | | 0.0946*** (3.51) |
| Housing quality | | | | | | | 0.0464*** (5.19) |
| Agricultural share | | | | | | | 0.0217 (0.58) |
| Manufacturing share | | | | | | | -0.0282 (-0.72) |
| Land value | | | | | | | 0.0413** (1.98) |
| Population density | | | | | | | -0.1085*** (-4.90) |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Local government district FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property type FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month \times Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 27,936 | 29,682 | 31,897 | 31,897 | 31,838 | 31,897 | 31,706 |
| MOP weak-ID F-stat | 24.81 | 34.48 | 24.40 | 24.61 | 30.80 | 24.97 | 29.02 |
| 10% critical value | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 95% AR confidence interval | [.03, .33] | [.03, .29] | [.04, .34] | [.04, .37] | [.08, .35] | [.09, .41] | [.08, .37] |

Notes: This table presents estimates of equation (6). Variable definitions are shown in Table 8.J. The unreported control variables are bedrooms, bathrooms, receptions, population, GVA, rural, and grammar school distance. Standard errors are clustered by neighborhood (data zone) and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

the creation of markets that differentially influence subsequent economic development. Harbors and navigable rivers have potentially similar effects by encouraging easier settlement and access to trade routes. Colonists may fortify prosperous settlements to protect their investments. In column 6, we capture these influences by adding controls for distance to the nearest pre-colonization castle, harbor, a dummy for whether a navigable river runs through the parish a neighborhood is located in, and distance to a Plantation fort. While some of these factors correlate significantly with contemporary house prices, the multicultural parameter estimate is unaffected.

The 1821, 1841, and 1851 censuses provide the earliest data on demographics, economic development, and industrial specialization in Ireland. Using this information we append the model with controls for the intensity of the Irish Potato famine, housing quality, the population share working in agriculture and manufacturing, per-acre land values, and population density. The estimates in column 7 remain robust.

Next, we examine the importance of more contemporary phenomena. Between the late 1960s and 1998 a conflict between loyalist (Protestant) and republican (Catholic) paramilitary groups known as the Troubles resulted in approximately 3,500 deaths. The legacy of the Troubles may persist through time. Using street-level information on every Troubles death, we calculate a neighborhood's exposure to the violence and its composition

Table 12: Contemporary Robustness Tests

| Sample | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|----------------------------------|---------------------|-----------------------|---------------------|---------------------|---------------------|-----------------------|---------------------|--------------------|---------------------|---------------------|---------------------|
| | All | | | | | Ex-inv | Pandemic | | Monetary tightening | | |
| | | | | | | | | During | Post | Pre | Post |
| Dependent variable: sale price | | | | | | | | | | | |
| Multiculturalism ²⁰²¹ | 0.1815** (2.50) | 0.2034*** (2.63) | 0.1971*** (2.86) | 0.1872*** (2.77) | 0.1897*** (2.86) | 0.1391** (2.08) | 0.1991*** (2.97) | 0.1736** (2.28) | 0.2136*** (2.66) | 0.1567*** (2.33) | 0.2344*** (2.60) |
| Troubles deaths | -0.0016* (-1.82) | | | | | | | | | | |
| Loyalist violence | | -0.1013*** (-5.33) | | | | | | | | | |
| Republican violence | | 0.0317 (0.77) | | | | | | | | | |
| Immigration (non-UK) | | | 0.1619*** (2.60) | | | | | | | | |
| Net migration (domestic) | | | 0.0456 (0.68) | | | | | | | | |
| Housing stock | | | -0.0113 (-0.61) | | | | | | | | |
| Grammar schools | | | | 0.0074*** (3.84) | | | | | | | |
| Mortgage credit | | | | | 0.0621*** (8.73) | | | | | | |
| Unemployment | | | | | | -0.0128*** (-8.85) | | | | | |
| Control variables | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Local government district FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Property type FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Month × Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 31,897 | 31,897 | 31,897 | 31,897 | 31,897 | 31,897 | 30,938 | 16,806 | 15,091 | 18,430 | 13,467 |
| MOP weak-ID F-stat | 27.76 | 23.25 | 31.07 | 30.88 | 31.23 | 24.74 | 32.19 | 23.64 | 30.86 | 26.45 | 29.74 |
| 10% critical value | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 | 23.11 |
| 95% AR confidence interval | [.06, .36] | [.07, .40] | [.08, .35] | [.07, .34] | [.08, .34] | [.03, .29] | [.09, .37] | [.05, .35] | [.05, .35] | [.03, .31] | [.08, .46] |

Notes: This table presents estimates of equation (6). Variable definitions are shown in Table 8.J. The unreported control variables are bedrooms, bathrooms, receptions, population, GVA, rural, and school quality. Standard errors are clustered by neighborhood (data zone) and the corresponding t -statistics are reported in parentheses. *, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

composition (loyalist/republican victims). Importantly, the instrument does not predict the intensity of the Troubles. Columns 1 and 2 of Table 12 show prices are somewhat lower in areas with more intense exposure to violence, and this effect is more pronounced for violence against loyalist communities. However, the multicultural parameter remains very similar to the baseline effect.

Immigration and movement by people within Northern Ireland may influence housing demand within a neighborhood, while changes in the housing stock affect supply and equilibrium prices. Households may locate in proximity to grammar schools because they provide better educational outcomes.³⁷ Numerous studies show a link between property prices and access to mortgage credit. Local economic conditions, captured by the neighborhood unemployment rate, may influence property values. While all of these factors could correlate with multiculturalism, the findings are robust to controlling for these factors in columns 3 to 6, and hold when excluding investment properties in column 7.

The early sample period spans the COVID-19 pandemic, when property prices appreciated in the face of greater demand for larger houses and households accumulated savings. During the later sample window the Bank of England quickly tightened monetary policy in an effort to contain inflation. While these are aggregate phenomena that the month-year fixed effects capture, we show in columns 8 to 11 that multiculturalism exerts a significantly positive effect on house prices before and after each episode.

7.4 Non-linear Neighborhood Demand

While we assume demand and cultural shares are linearly related, the possibility exists for a non-linear, say logarithmic, relationship. For example, when the Catholic population share is 0, demand is restricted to Protestants and prices tend to be low and vice versa. House prices are then highest where the groups have equal population shares resulting in an inverse-U-shaped relationship between own population shares and prices.

³⁷A grammar school is a selective school for students aged 11-18 that admits students within their catchment area based on their academic ability. These schools offer an academically focused curriculum, often preparing students for mandatory exams. A higher proportion of students progress to higher education relative to non-selective schools.

To test this conjecture, we first estimate

$$P_{int} = \alpha + \beta X_{int} + \varphi_{nt} + \varepsilon_{int}, \quad (10)$$

where P_{int} is the sales price of house i in neighborhood n during month-year t ; X_{int} is the vector of control variables in column 1 of Table 6; φ_{nt} and φ_t denote neighborhood-month-year fixed effects; ε_{int} is the error term. From this regression, we retrieve $\hat{\varphi}_{nt}$, which measures the average relative price of sold properties in the neighborhood during month t after controlling for their characteristics and unobserved heterogeneity. Next, we estimate

$$\hat{\varphi}_{nt} = \alpha + \beta_1 S_{nt} + \beta_2 S_{nt}^2 + \varphi_n + \varphi_t + \varepsilon_{nt}, \quad (11)$$

where all variables are defined as previously, except S_n and S_n^2 is either the Catholic or Protestant population share and its square, respectively, and ε_{nt} is the error term.

Columns 1 and 2 of Online Appendix Table 2.A present estimates of equation (11) using the Catholic share. We find evidence of diminishing returns. Increasing the Catholic share significantly increases prices, but the squared Catholic share coefficient estimate is significantly negative, leading to a turning point when Catholics exceed 42% of the population. The patterns hold in column 3 when we measure S_{nt} using the Protestant share, although the turning point is somewhat higher. Online Appendix Figure 1.A graphically depicts the results showing the downward-opening parabola. Furthermore, it indicates increasing returns to multiculturalism. Relaxing the assumption of linear demand thus leaves the key inferences unchanged.

8 Conclusions

Our examination of how multiculturalism influences residential property prices reaches two conclusions. First, households are willing to pay a premium to live in culturally diverse areas, which reflects a demand. Assets located in culturally diverse areas are more liquid as they sell faster, and attract a greater number of potential buyers. These patterns reflect

that multicultural neighborhoods appeal to buyers from a broader cross-section of society whereas demand for housing in homogenous areas is more limited to households that share existing residents' culture. This is a novel finding that departs from existing contributions emphasizing the role of discrimination and social networks (Wong, 2013; Agarwal et al., 2019).

Second, our data allow us to study neighborhoods' residential composition across almost 400 years. This time span is unique, and considerably longer than the information available in prior studies. Contrary to theoretical models' predictions on residential sorting, we find remarkable persistence multiculturalism. Even under mild homophilic preferences, agents should quickly sort into highly segregated areas (Schelling, 1971; Card et al., 2008), however, our data show imperfect sorting even over a very long horizon. We interpret this finding as evidence that there are local socioeconomic benefits of living in mixed neighborhoods that agents incorporate into their location choices and potentially dominate the tendency to cluster in homogeneous areas.

Our results have many important public policy implications. The Good Friday Agreement, which began Northern Ireland's peace process, stimulated faster house price appreciation between 1998 and 2007 in areas with greater ex-ante exposure to violence (Besley and Mueller, 2012). Our econometric setup accounts for this and the legacy of violence. However, the findings indicate that property prices may increase where neighborhoods become more multicultural following the cessation of violence. In other contexts, policymakers encourage culturally diverse neighborhoods through regulation and devote substantial amounts of money in their budgets to support it.³⁸ Such measures are often justified on the grounds of improving cohesion, maintaining social capital and limiting burdens

³⁸Notable examples include the Gautreaux Program in Chicago that offered rent subsidies to African Americans living in public housing who wished to move to diverse areas. The city of Zürich's Integration Policy aims to create societal cohesion by ensuring cultural mixing in a neighborhood when deciding upon apartment rental applications. Singapore places upper limits on the number of Chinese, Indian and Malay households living in a precinct to avoid ethnic segregation. Germany, the Netherlands and the United Kingdom impose strict restrictions on where refugee immigrants settle to avoid ethnic concentration, while many countries have 'integration maintenance programs' or 'neighborhood stabilization programs' to encourage diversity (Wong, 2013). The European Union's Asylum, Migration and Integration fund dedicates €9.9 billion to promoting a multicultural society while the integration budget is \$615 million and \$738 million in Sweden and the Netherlands, respectively (Wong, 2014).

on public services. However, an unintended consequence may be that this increases the attractiveness of a neighborhood and drives up property values.

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Online Appendix

A Additional Tables and Figures

Table 1.A: Mixed and Segregated Neighborhood Characteristics

| Dependent variable | 1 Housing stock | 2 School grades | 3 Degree share | 4 Management & professional |
|--------------------|-----------------------|-----------------------|----------------------|-----------------------------------|
| Mixed | 0.0064 (0.40) | 0.0142*** (3.21) | 0.1105*** (4.82) | 0.1894*** (4.83) |
| LGD FE | Yes | Yes | Yes | Yes |
| Observations | 3,661 | 3,661 | 3,661 | 3,661 |
| R^2 | 0.038 | 0.126 | 0.043 | 0.055 |

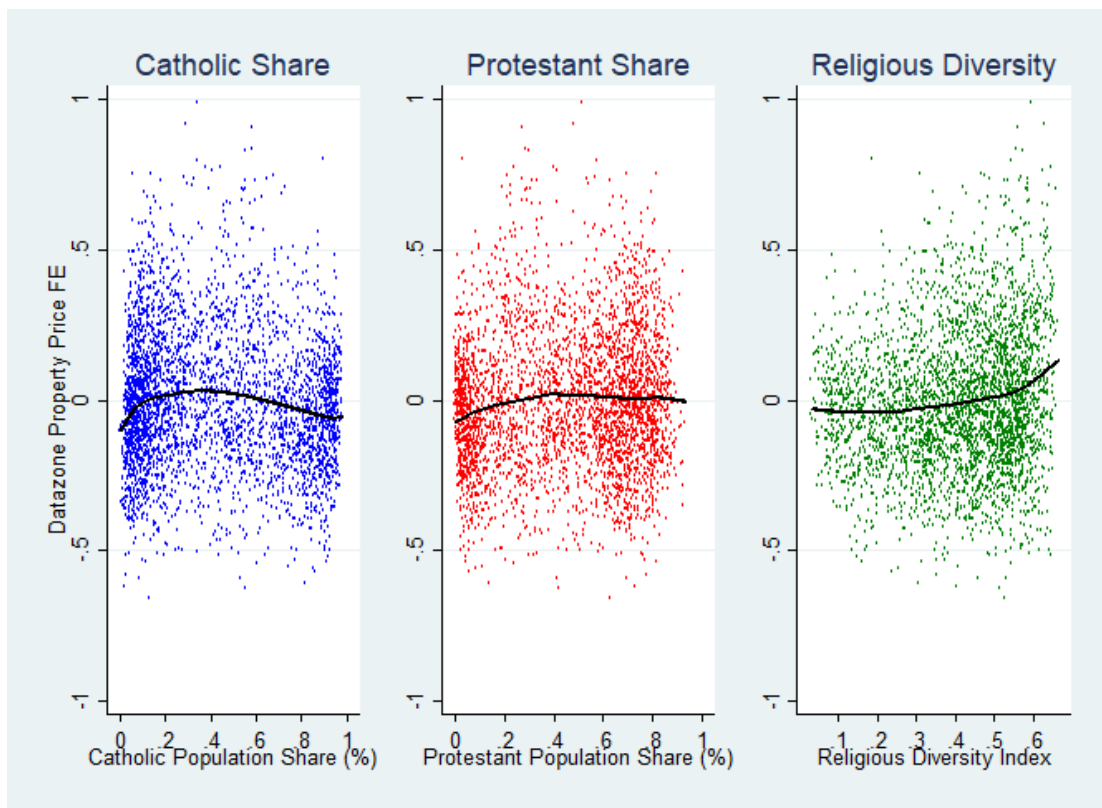
Notes: Panel A presents estimates of $Y_{na} = \alpha + \beta Mixed_{na} + \varphi_a + \varepsilon_{na}$ where Y_{na} is an outcome variable in neighborhood n in LGD a ; $Mixed_{na}$ is a dummy variable equal to 1 if the Catholic population share is at least 33% and the Protestant population share is at least 33%, 0 otherwise; φ_a denotes LGD fixed effects; ε_{na} is the error term. The sample contains all neighborhoods. Variable definitions are shown in Table 8.J. We cluster the standard errors by LGD and report the corresponding t -statistics in parentheses. *** denote statistical significance at the 1% level.

Table 2.A: Religious Composition and FE by Data Zone

| | 1 | 2 | 3 | 4 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Dependent variable: neighbourhood price residual | | | | |
| Catholic share | 0.375*** (0.0555) | 0.372*** (0.0571) | | |
| Catholic share ² | -0.445*** (0.0546) | -0.450*** (0.0560) | | |
| Protestant share | | | 0.315*** (0.0541) | 0.322*** (0.0546) |
| Protestant share ² | | | -0.305*** (0.0640) | -0.302*** (0.0645) |
| Neighborhood Controls | No | Yes | No | Yes |
| Month \times Year FE | Yes | Yes | Yes | Yes |
| Observations | 3,472 | 3,472 | 3,472 | 3,472 |
| R-squared | 0.025 | 0.043 | 0.011 | 0.028 |

The dependent variable is the datazone-level fixed effect, λ_{dz} , obtained from estimating $\log(P_{it}) = \alpha + \beta_1 \text{Bedrooms}_i + \beta_2 \text{Bathrooms}_i + \beta_3 \text{Receptions}_i + \gamma \text{PropertyType}_i + \theta_t + \lambda_{dz} + \varepsilon_{it}$, where θ_t denotes month-year fixed effects. These λ_{dz} are then regressed on religious composition variables (Catholic and Protestant shares and their squares); specifications (2) and (4) additionally include controls for $\log(\text{population})$, $\log(\text{gross value added})$, and an indicator for urban/rural/mixed datazones. Standard errors are reported in parentheses, and *** indicates $p < 0.01$.

Figure 1.A: Datazone Property Prices by Religious Composition



Notes: This figure plots the neighborhood price residual from equation (10) against the Catholic population share, the Protestant population share, and the Multiculturalism index. We fit Lowess curves to the distribution to nonparametrically describe the relationship between the variables.

Table 3.A: House Prices in Mixed and Segregated Neighborhoods

| Neighborhood composition | Mean sales price (£) |
|---|----------------------|
| 40% minimum Catholic & Protestant share | 123,007 |
| 45% minimum Catholic & Protestant share | 135,944 |
| 90%+ Catholic share | 101,722 |
| 90%+ Protestant share | 103,777 |

Notes: This table reports the mean sales price of properties in multicultural (defined as those where the Catholics and Protestants each account for at least 40% or 45% of neighborhood population, that is, together they make-up at least 80% or 90% of total population) and segregated neighborhoods (defined as those where Catholics account for at least 90% of neighborhood population, or where Protestants account for at least 90% of neighborhood population).

B Northern Ireland Life and Times Survey Variables

Table 4.B: NILT Variable Description

| Variable | Description |
|--|--|
| Support a Nationalist party | A dummy variable equal to 1 if individual i supports a Nationalist political party, 0 otherwise |
| Support a Unionist party | A dummy variable equal to 1 if individual i supports a Unionist political party, 0 otherwise |
| Do you think of yourself as a Nationalist? | A dummy variable equal to 1 if individual i reports they view themselves as a Nationalist, 0 otherwise |
| Do you think of yourself as a Unionist? | A dummy variable equal to 1 if individual i reports they view themselves as a Unionist, 0 otherwise |
| Should NI remain part of the UK? | A dummy variable equal to 1 if individual i reports the long-term policy for Northern Ireland is to remain part of the UK (either through direct rule or a devolved government), 0 otherwise |
| Should NI reunify with ROI? | A dummy variable equal to 1 if individual i reports the long-term policy for Northern Ireland is to reunify with the rest of Ireland, 0 otherwise |
| National identify is British | A dummy variable equal to 1 if individual i thinks of them self as British, 0 otherwise |
| National identify is Irish | A dummy variable equal to 1 if individual i thinks of them self as Irish, 0 otherwise |
| See yourself as part of Protestant community | A dummy variable equal to 1 if individual i thinks of them self as part of the Protestant community, 0 otherwise |
| Spouse has same national identity | A dummy variable equal to 1 if individual i 's spouse has the same national identity, 0 otherwise |
| Spouse is Catholic | A dummy variable equal to 1 if individual i 's spouse is Catholic, 0 otherwise |
| Favorable view of Catholic people | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, 'How favourable or unfavourable do you feel about people from the Catholic community?' |
| Favorable view of Protestant people | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, 'How favourable or unfavourable do you feel about people from the Protestant community?' |
| Feel safe in a Catholic school | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, 'How safe would you feel going to an event in a Catholic secondary school?' |
| Feel safe in a Protestant school | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, 'How safe would you feel going to an event in a Protestant secondary school?' |
| Catholic traditions enhance society | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, 'Do the culture and traditions of the Catholic community add to the richness and diversity of Northern Ireland society?' |

Table 1.A cont'd: NILT Variable Description

| Variable | Description |
|--|--|
| Protestant traditions enhance society | A five point scale ranging between very unfavorable (0) and very favorable (4) in answer to the question, ‘Do the culture and traditions of the Protestant community add to the richness and diversity of Northern Ireland society?’ |
| Bonfires are legitimate cultural celebration | A five point scale ranging between strongly disagree (0) and strongly agree (4) in response to the question, ‘Are bonfires a legitimate form of cultural celebration?’ |
| Support flying flags | A five point scale ranging between strongly disagree (0) and strongly agree (4) in response to the question, ‘Do you support the flying of flags on lampposts throughout Northern Ireland on special dates for particular celebrations?’ |
| Feel safe in a GAA club | A five point scale ranging between very unsafe (0) and very safe (4) in response to the question, ‘How safe would you feel going to an event in a GAA club?’ |
| Feel safe in an Orange Hall | A five point scale ranging between very unsafe (0) and very safe (4) in response to the question, ‘How safe would you feel going to an event in an Orange Hall?’ |
| Live in majority Protestant area | A dummy variable equal to 1 if individual i describes the area they live in as mainly Protestant, 0 otherwise |

Notes: This table provides variable descriptions for the variables in Table 1. Source: ARK. Northern Ireland Life and Times Survey, 2022 [computer file]. ARK www.ark.ac.uk/nilt [distributor], June 2023.

C Understanding Society Database

Table 5.C: Understanding Society Variable Description

| Variable | Description |
|---------------------------------|---|
| Monthly gross HH income | Gross monthly household income in £ |
| Monthly net HH income | Post-tax monthly household income in £ |
| Number not employed in HH | Number of working age household individuals not in paid employment |
| Managerial position | A dummy variable equal to 1 if the household head works in a managerial position, 0 otherwise |
| Weekly job hours | Number of hours normally worked per week |
| Weekly overtime hours | Number of overtime hours in normal week |
| Weekly paid overtime hours | Number of hours worked as paid overtime per week |
| Industry code | SIC 2007 code of the industry the household head currently works in |
| Private employer | A dummy variable equal to 1 if the household head works for a private company, 0 otherwise |
| Rooms in house | Number of rooms in house |
| Property cost | Original property price (ln) |
| Year mortgage began | Year in which mortgage was first taken out |
| Remaining mortgage term | Number of remaining years on mortgage |
| Mortgage balance | Outstanding mortgage debt |
| Interest only mortgage | A dummy variable equal to 1 if the mortgage is interest only, 0 otherwise |
| Monthly mortgage | Monthly mortgage payment |
| Monthly rent | Monthly rent payment |
| Home equity | Property value less any outstanding mortgage balance |
| Late on housing | A dummy variable equal to 1 if the household is behind on monthly housing payments, 0 otherwise |
| Financial outlook | Subjective future financial situation |
| Gas bill | Annual gas expenditure |
| Heating oil bill | Annual heating oil expenditure |
| Electricity bill | Annual electricity expenditure |
| Monthly food bill | Monthly expenditure per household member on food from supermarkets and outside the home |
| Monthly supermarket expenditure | Monthly expenditure per household member on supermarket groceries |
| Washing machine | A dummy variable equal to 1 if the household has a washing machine, 0 otherwise |
| Drier | A dummy variable equal to 1 if the household has a tumble drier, 0 otherwise |
| Dish washer | A dummy variable equal to 1 if the household has a dish washer, 0 otherwise |
| Mobile phone | A dummy variable equal to 1 if the household has a mobile telephone, 0 otherwise |
| General health | Subjective rating of the respondent's health |
| GP visits | Number of visits to a general practitioner clinic during past 12 months |
| Outpatient visits | Number of visits to an out-patient clinic during past 12 months |
| Hospital visits | Number of visits to a hospital during past 12 months |

Table 2.B Cont'd: Understanding Society Variable Description

| Variable | Description |
|-----------------------------------|--|
| Ethnicity | Ethnicity of the household members (1: white, 2: Gypsy or Irish Traveller, 3: any other white background, 4: Black Caribbean, 5: Black African, 6: Asian, 7: any other mixed background, 8: Indian, 9: Bangladeshi, 10: Chinese) |
| Similar to others in neighborhood | A five point scale between 1 (strongly agree) and 5 (strongly disagree) that the household is similar to others in the neighborhood |
| Will stay in neighborhood | A five point scale between 1 (strongly agree) and 5 (strongly disagree) that the household plans to stay in the neighborhood |
| Buckner's neighborhood cohesion | Buckner's (1988) neighborhood cohesion instrument |
| Years of education | Years completed in education |
| Married | A dummy variable equal to 1 if the household head is married, 0 otherwise |
| Catholic | A dummy variable equal to 1 if the household identifies as Catholic, 0 if it identifies as Protestant |

Notes: This table defines each of the variables we use from the Understanding Society database. The source provides individual-level panel data, and weights for each individual, so that researchers can construct a nationally representative data set.

Table 6.C: Understanding Society Descriptive Statistics

| Variable | 1 Obs | 2 Mean | 3 σ | 4 Min | 5 Max |
|-----------------------------------|----------|-----------|---------------|----------|----------|
| Monthly gross HH income | 3,521 | 2,842 | 2084 | 0 | 16,694 |
| Monthly net HH income | 3,521 | 2,464 | 1,967 | 0 | 49,029 |
| Number not employed in HH | 3,521 | 0.99 | 0.89 | 0 | 7 |
| Managerial position | 1,325 | 0.36 | 0.48 | 0 | 1 |
| Weekly job hours | 1,377 | 32.46 | 10.56 | 2 | 84 |
| Weekly overtime hours | 1,372 | 2.17 | 4.62 | 0 | 50 |
| Weekly paid overtime hours | 393 | 3.91 | 5.39 | 0 | 40 |
| Industry code | 1,607 | 64.43 | 25.38 | 1 | 99 |
| Private employer | 1,375 | 0.57 | 0.50 | 0 | 1 |
| Rooms in house | 3,518 | 5.17 | 1.67 | 1 | 14 |
| Property cost | 712 | 10.68 | 1.31 | 3.61 | 13.82 |
| Year mortgage began | 407 | 2000 | 7.77 | 1972 | 2019 |
| Remaining mortgage term | 389 | 15.51 | 7.77 | 0 | 36 |
| Mortgage balance | 577 | 10.62 | 1.90 | 0 | 13.68 |
| Interest only mortgage | 401 | 0.01 | 0.08 | 0 | 1 |
| Monthly mortgage | 1,116 | 468 | 575 | 1 | 13,000 |
| Monthly rent | 485 | 199 | 204 | 0 | 1,050 |
| Home equity | 337 | 10.72 | 3.09 | 0 | 14.91 |
| Late on housing | 1,984 | 0.11 | 0.31 | 0 | 1 |
| Financial outlook | 3,465 | 2.65 | 0.67 | 1 | 3 |
| Gas bill | 994 | 402 | 394 | 0 | 3,500 |
| Heating oil bill | 2,721 | 912 | 494 | 0 | 7,000 |
| Electricity bill | 919 | 674 | 405 | 0 | 8,000 |
| Monthly food bill | 3,521 | 178 | 123 | 0 | 4,800 |
| Monthly supermarket expenditure | 3,521 | 145 | 109 | 0 | 4,800 |
| Washing machine | 3,515 | 0.98 | 0.14 | 0 | 1 |
| Drier | 3,515 | 0.68 | 0.47 | 0 | 1 |
| Dish washer | 3,515 | 0.52 | 0.50 | 0 | 1 |
| Mobile phone | 3,515 | 0.89 | 0.31 | 0 | 1 |
| General health | 2,226 | 2.65 | 1.18 | 1 | 5 |
| GP visits | 1,040 | 4.62 | 4.29 | 0 | 10 |
| Outpatient visits | 1,038 | 2.33 | 3.65 | 0 | 10 |
| Hospital visit | 1,042 | 0.12 | 0.32 | 0 | 1 |
| Ethnicity | 3,495 | 1.08 | 0.75 | 1 | 10 |
| Similar to others in neighborhood | 853 | 2.06 | 0.89 | 1 | 5 |
| Will stay in neighborhood | 852 | 1.94 | 0.96 | 1 | 5 |
| Buckner's neighborhood cohesion | 826 | 3.86 | 0.74 | 1 | 5 |
| Years of education | 3,521 | 14.14 | 1.38 | 11 | 17 |
| Married | 3,521 | 0.16 | 0.37 | 0 | 1 |

Notes: This table reports summary statistics for the variables in Table 2. σ denotes standard deviation.

D External Validity - Republic of Ireland

We exploit the fact that the counties Donegal and Monaghan were also part of the Ulster Plantation, but today belong to the Republic of Ireland, to conduct external validity tests. The Property Services Regulation Authority provides information on the address, date of sale, price and a description of the property for every housing transaction in the Republic of Ireland since 2010. We define a neighborhood as the census ‘small area’ in which a property is located. These geographical units are comparable to data zones, and we merge in information on each small area’s religious composition from the 2022 census. Finally, we link small areas to 1841 parishes and merge in the 1659 British and Irish population shares.

Data

We continue to rely on the 1659 Census of Ireland to construct the instrument. For contemporary multiculturalism data, we rely on the 2022 Irish Census at the Small Area level, which we designate as a neighborhood similar to a DZ. This source reports the proportion of Catholics and other religions living in each neighborhood. Consequently, we construct a 2022 multicultural measure using a simplified HHI based on the share of Catholics versus the share of all other groups:

$$Multiculturalism_n^{2022} = 1 - (Catholic_n^2 + Non - Catholic_n^2).$$

Property Transactions Data

Property-level price data is taken from the Irish Property Price Register (PPR), which records every property sale in the ROI since January 1, 2010.³⁹ Each PPR record details:

- The address of the property sold, including its Eircode.
- The transaction price (in euros).

³⁹Data accessed on November 25, 2024, via <https://www.propertypriceregister.ie/>

- The date of sale.
- Information on whether the property is new or second-hand.
- Whether the transaction is subject to a VAT charge.

Address Matching and Geolocation

An Eircode is the ROI's equivalent to the UK's postcode or a zip code in the United States. We merge together the property-level information with small areas in the 2022 Irish census by determining which small area each Eircode is located. This is achieved using a fuzzy string matching algorithm, applying an 80% similarity cutoff to ensure accurate matches. Once matched, the properties are geolocated to enable spatial analysis. We using GIS mapping to overlay small areas with historic parishes to merge in the 1659 data.

E Title Deeds Data

The Title Deeds

Title deeds are official legal documents proving ownership of property and typically include detailed information such as the date of registration, consideration paid (the transaction price), and the names of the current and previous owners. We complement our scraped data from PropertyPal with official records by obtaining copies of approximately 2,500 title deeds from the Land and Property Services (LPS) Northern Ireland. We randomly sample the entire `propertypal.com` database using stratification to ensure the subsample is geographically representative of the main sample.

We extract essential information from these deeds, notably the registration dates, consideration amounts, and owners' names. We then examine deeds that record at least two registered owners, thereby allowing us to identify the names of the transacting parties. This procedure results in 4,444 distinct transactions involving 1,828 unique properties. We then merge the title deeds information with the property characteristics from `propertypal.com`.

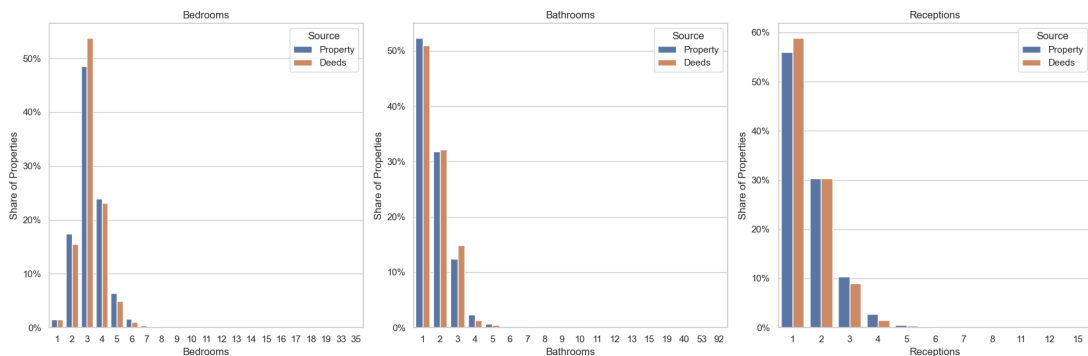
Representativity Tests

We first validate whether the title deeds subsample accurately represents the properties in the broader sample. Figure 2.E illustrates the distributions of property characteristics such as bedrooms, bathrooms, and receptions, within the deeds data set against those in the full sample. The comparison reveals no significant deviations, suggesting the properties present in the title deeds are broadly similar to those in our main dataset.

Identifying Religious Identity

Title deeds provide insights into the cultural background of transacting parties. In Northern Ireland, surnames often serve as strong indicators of religious background, reflecting historical demographic patterns influenced by religious affiliation. Owing to the low historical incidence of intermarriage between Catholics and Protestants, surnames have re-

Figure 2.E: Representativeness Tests



mained strongly affiliated with a specific religion over time. To distinguish buyers' and sellers' religious background, we leverage data from the 1901 Census of Ireland, collated by Barry Griffin, which provides detailed information on the proportion of individuals with specific surnames affiliated with Catholic or Protestant backgrounds. Matching surnames from the title deeds with those listed in the 1901 census, we classified surnames as either Catholic or Protestant if more than 80% of individuals bearing those surnames identified with one of these groups at that time. Transfers involving firms or companies were excluded to ensure accuracy in assigning individual religious identities. We further identify transactions occurring between related family members by comparing the surnames of buyers and sellers listed on the deeds. Transactions involving family transfers can commonly occur for various reasons, including the addition of a spouse to the deed or property inheritance. We classified a transaction as a family transfer if there was direct overlap in the surnames of buyers and sellers. These family transfers typically involve no consideration paid, indicating that such transfers represent internal household or family reorganization rather than market-based transactions. Owing to their nature, these transactions do not substantially influence price-based analyses in our study.

Table 7.E summarizes the distribution of transactions by religious identity categories under different sample restrictions:

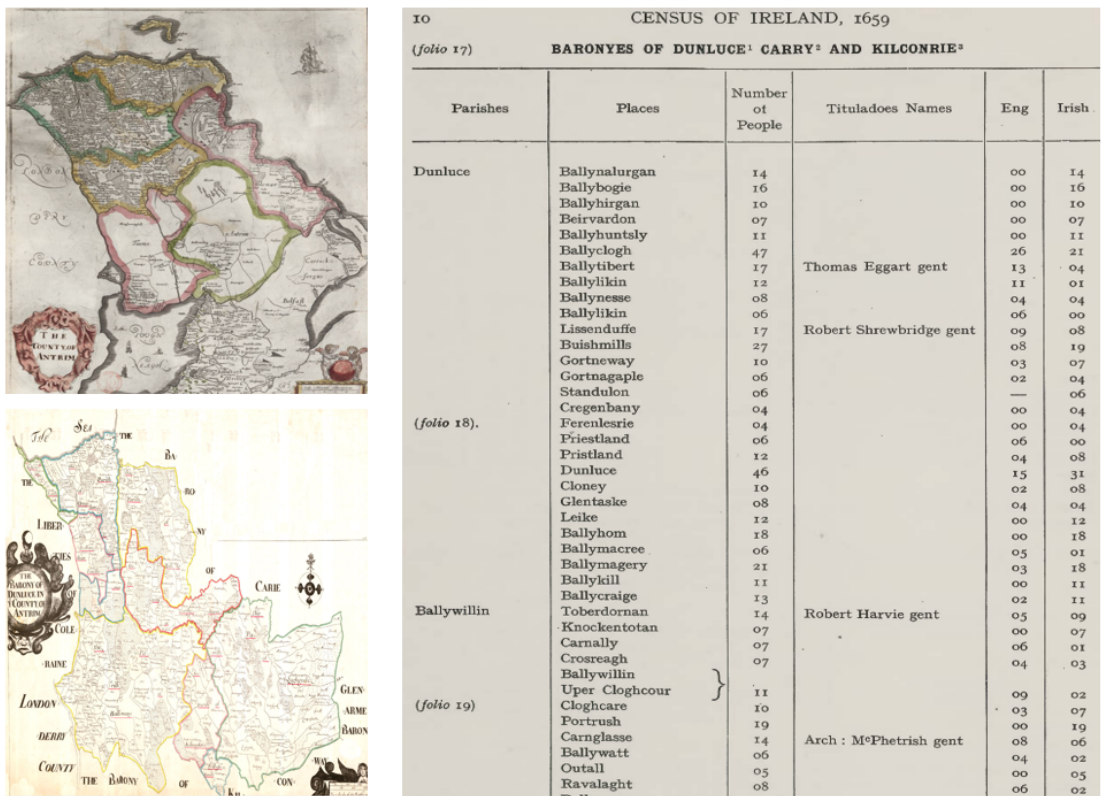
Table 7.E: Distribution of Transactions by Religious Identity

| Transaction Category | All Transactions | Post-2019 | Post-2019 Excl. Firms | Post-2019 Excl. Firms & Family |
|------------------------------|------------------|-----------|-----------------------|--------------------------------|
| Catholic to Catholic | 493 | 203 | 203 | 163 |
| Catholic to Protestant | 125 | 67 | 67 | 67 |
| Protestant to Protestant | 424 | 156 | 156 | 113 |
| Protestant to Catholic | 147 | 83 | 83 | 83 |
| Catholic to Unidentified | 428 | 245 | 245 | 244 |
| Protestant to Unidentified | 521 | 283 | 283 | 276 |
| Unidentified to Unidentified | 2306 | 1067 | 1067 | 989 |

Note:“Unidentified” refers to surnames not strongly associated with either Catholic or Protestant religious groups (less than 80% association). The exclusion of firms and family transfers helps isolate direct individual-to-individual property transactions.

F Down Survey and 1659 Census of Ireland Examples

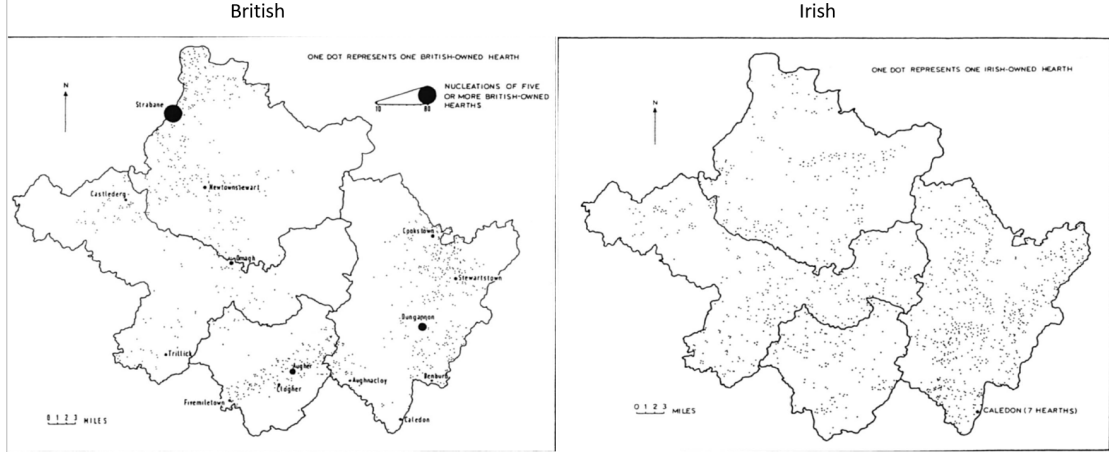
Figure 3.F: Census of 1659 Data



Notes: This figure shows maps from the Down Survey. The top left figure illustrates some of the baronies within county Antrim. The bottom left figure details the parishes that lie within the barony of Dunluce and their constituent townlands. The table on the right provides an example of the population data collected by the 1659 Census of Ireland. The left column lists parish names while the second column details the places (townlands) within each parish. For each townland the census reports the number of English and Scottish (labelled Eng) and Irish inhabitants living there. Titulados Names report the names of noblemen living within a townland. A Titulado often owned land, though not in every instance.

G Tyrone Hearth Money Map

Figure 4.G: Tyrone Hearth Map, 1666



Notes: This figure illustrates the location and number of British and Irish households paying the hearth tax in Tyrone during 1666. Source: Figures 3 and 4 in Robinson (1978).

H Mapping the 1659 Census to Contemporary Neighborhoods

In the 1659 census, population counts are available by townland which is nested within a parish. We first clean the data to ensure every historical townland is matched to the correct parish using <https://www.townlands.ie/>. Next, we establish to what extent each DZ n and parish p overlap using an “overlap-weight”

$$w_{np} = \frac{\text{Area}(DZ_n \cap p)}{\text{Area}(p)}. \quad (12)$$

These weights allow us to impute raw counts of British and Irish inhabitants into each DZ via

$$\tilde{B}_n = \sum_p w_{np} B_p, \quad \tilde{I}_n = \sum_p w_{np} I_p. \quad (13)$$

We then convert these into DZ-level shares by dividing by the total of the two groups:

$$B_n = \frac{\tilde{B}_n}{\tilde{B}_n + \tilde{I}_n}, \quad I_n = \frac{\tilde{I}_n}{\tilde{B}_n + \tilde{I}_n}. \quad (14)$$

I Integration Index

We calculate the integration index following Cutler et al. (1999). This approach requires religious composition of areas within a neighborhood. Since DZs are the lowest-level unit of analysis in the 2021 census, under this approach we define a neighborhood as a super data zone (SDZ).

$$\text{Index of integration} = 1 - \frac{\sum_{i=1}^N \left(\frac{\text{Catholic}_i}{\text{Catholic}_{\text{total}}} \cdot \frac{\text{Catholic}_i}{\text{Persons}_i} \right) - \left(\frac{\text{Catholic}_{\text{total}}}{\text{Persons}_{\text{total}}} \right)}{\min \left(\frac{\text{Catholic}_{\text{total}}}{\min_i(\text{Persons}_i)}, 1 \right) - \left(\frac{\text{Catholic}_{\text{total}}}{\text{Persons}_{\text{total}}} \right)} \quad (15)$$

In the equation above i refers to a DZ while *total* denotes a SDZ. All DZs are nested within a unique SDZ. The integration index begins with the percentage Catholic of the DZ occupied by the average Catholic in the SDZ or $\sum_{i=1}^N (\text{Catholic}_i / \text{Catholic}_{\text{total}}) \times (\text{Catholic}_i / \text{Persons}_i)$ where Persons_i denotes the total population of DZ i . We eliminate the effect coming from the overall size of the Catholic population by subtracting from this the percentage of Catholics in the SDZ as a whole ($\text{Catholic}_{\text{total}} / \text{Persons}_{\text{total}}$). Where there are low numbers of Catholics in the SDZ (i.e. neighborhood), it will be impossible for Catholics to be completely isolated from Protestants. The maximum value of this measure is $\min(\text{Catholic}_{\text{total}} / \text{Persons}_i, 1) - (\text{Catholic}_{\text{total}} / \text{Persons}_{\text{total}})$, where Persons_i is the size of the minimum population area (i.e. DZ). Cutler et al. (1999) divide the index by this maximum value so that the adjusted index ranges from 0 to 1. We subtract this value from 1 to provide a measure of integration rather than isolation.

J Variable Descriptions

Table 8.J: Variable Descriptions

| Variable | Description | Source | Aggregation |
|----------------------------------|--|----------------------------------|--------------|
| Multiculturalism ²⁰²¹ | Cultural diversity in 2021 in neighborhood n | 2021 UK Census | Neighborhood |
| Multiculturalism ¹⁶⁵⁹ | Cultural diversity in 1659 in the parish neighborhood n is nested | 1659 Irish Census | Neighborhood |
| Price | Price of house h in neighborhood n | propertypal.com | Property |
| Bedrooms | Number of bedrooms in house h in neighborhood n | Propertypal.com | Property |
| Bathrooms | Number of bathrooms in house h in neighborhood n | Propertypal.com | Property |
| Receptions | Number of reception rooms in house h in neighborhood n | Propertypal.com | Property |
| Population | Population living in neighborhood n | 2021 UK Census | Neighborhood |
| GVA | Gross value added in neighborhood n | 2021 UK Census | Neighborhood |
| Rural | A dummy variable equal to 1 if neighborhood n is rural, 0 otherwise | 2021 UK Census | Neighborhood |
| School grades | The mean GCSE grades of students at the nearest three schools to neighborhood n | Dept. of Education | Neighborhood |
| Views | The mean number of unique daily viewers for property h before STC | propertypal.com | Property |
| For sale (%) | The ratio of properties for sale in neighborhood n to total houses | propertypal.com & 2021 UK Census | Neighborhood |
| Sold ³⁰ (%) | The ratio of properties sold within 30 days of listing to total listings in neighborhood n | Authors' calculations | Neighborhood |
| Sold ⁶⁰ (%) | The ratio of properties sold within 30 days of listing to total listings in neighborhood n | Authors' calculations | Neighborhood |
| Catholic schools | The number of Catholic secondary schools within a 10 kilometer radius of neighborhood n | Authors' calculations | Neighborhood |
| Protestant schools | The number of Protestant secondary schools within a 10 kilometer radius of neighborhood n | Authors' calculations | Neighborhood |
| GAA clubs | The number of GAA clubs within a 10 kilometer radius of neighborhood n | Authors' calculations | Neighborhood |
| Orange Halls | The number of Orange Halls within a 10 kilometer radius of neighborhood n | Authors' calculations | Neighborhood |
| Degree share | The ratio of degree holders to total population in neighborhood n | 2021 UK Census | Neighborhood |
| Health clinics | The number of general practitioner clinics in neighborhood n | Open Data NI | Neighborhood |
| Dentists | The number of dental practices in neighborhood n | Open Data NI | Neighborhood |

Variable Descriptions cont'd

| Variable | Description | Source | Aggregation |
|--------------------------|---|-----------------------|--------------|
| Libraries | The number of libraries in neighborhood n | Open Data NI | Neighborhood |
| DFI expenditure | Per capita expenditure by the Department for Infrastructure in neighborhood n | Open Data NI | Neighborhood |
| Belfast commuting time | Time in hours to commute from neighborhood n to Belfast | Authors' calculations | Neighborhood |
| Failed sale | A dummy variable equal to 1 if house h in neighborhood n goes STC but is subsequently relisted, 0 otherwise | propertypal.com | Property |
| Price cut | A dummy variable equal to 1 if the price of house h in neighborhood n is reduced prior to STC, 0 otherwise | propertypal.com | Property |
| Featured | A dummy variable equal to 1 if house h in neighborhood n is a featured listing, 0 otherwise | propertypal.com | Property |
| Culturally-focused agent | A dummy variable equal to 1 if the average Protestant population share of the neighborhoods of a real estate agent's listings lies either below the 25 th or above the 75 th percentile | Authors' calculations | Property |
| Agent productivity | The average number of days on the market of properties marketed by the agent selling property h in neighborhood n | Authors' calculations | Property |
| English estate | A dummy variable equal to 1 if neighborhood n is located in an area colonized by an English Undertaker, 0 otherwise | Authors' calculations | Neighborhood |
| Undertaker estate | A dummy variable equal to 1 if neighborhood n is located in an area colonized by an Undertaker, 0 otherwise | Authors' calculations | Neighborhood |
| Non-plantation | A dummy variable equal to 1 if neighborhood n is located in an area outside the Ulster Plantation, 0 otherwise | Authors' calculations | Neighborhood |
| Battle distance | The distance between neighborhood n and the nearest battle during the Nine Years' War | Authors' calculations | Neighborhood |
| Castle distance | The distance between neighborhood n and the nearest pre-Ulster Plantation castle | Authors' calculations | Neighborhood |
| Plantation fort distance | The distance between neighborhood n and the nearest fort built during the Ulster Plantation | Authors' calculations | Neighborhood |
| Harbor distance | The distance between neighborhood n and the nearest pre-Ulster Plantation harbor | Authors' calculations | Neighborhood |
| Navigable river | A dummy variable equal to 1 if neighborhood n lies in a parish with a navigable pre-Ulster Plantation river | Authors' calculations | Neighborhood |

Variable Descriptions cont'd

| Variable | Description | Source | Aggregation |
|--------------------------|--|-------------------------------|--------------|
| Famine intensity | Population change between 1841 and 1851 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Housing quality | The ratio of first-class houses to total houses in 1841 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Agricultural share | The ratio of agricultural workers to total population in 1841 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Manufacturing share | The ratio of manufacturing workers to total population in 1841 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Land value | The per acre land value in 1821 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Population density | Population per square mile in 1841 in neighborhood n 's parish | Fernihough and O Grada (2022) | Neighborhood |
| Troubles deaths | The ratio of deaths to total population in neighborhood n | CAIN database | Neighborhood |
| Loyalist violence | The ratio of loyalist-affiliated deaths to total population in neighborhood n | CAIN database | Neighborhood |
| Republican violence | The ratio of republican-affiliated deaths to total population in neighborhood n | CAIN database | Neighborhood |
| Immigration (non-UK) | The ratio of non-UK immigrants to total population in neighborhood n | 2021 UK Census | Neighborhood |
| Net migration (domestic) | The ratio of net migration within Northern Ireland in neighborhood n | 2021 UK Census | Neighborhood |
| Housing stock | The number of properties in neighborhood n | 2021 UK Census | Neighborhood |
| Grammar schools | The number of grammar schools within a 10 kilometer radius of neighborhood n | Authors' calculations | Neighborhood |
| Mortgage credit | Mortgage credit originated per household in neighborhood n during month t | UK Finance | Neighborhood |
| Household deprivation | The rank of neighborhood n in terms of the share of deprived households | NOMIS | Neighborhood |
| Unemployment | The share of the workforce in neighborhood n that are unemployed | 2021 UK Census | Neighborhood |
| Health deprivation | The share of the households in neighborhood n that are in a deprived health state | NISRA | Neighborhood |
| Housing deprivation | The share of the households in neighborhood n living in a deprived housing | NISRA | Neighborhood |

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ISSN 2194-2188