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JEL Classification: D72, D31

Keywords: N/A

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Who turns out to vote? A fresh look into an old question*

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January 11, 2023

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Exploiting an individual-level administrative dataset in a large Italian municipality, we investigate the impact of income shocks and exposure to ethnic diversity on electoral turnout. A large positive income shock increases turnout only among the poor, while both adverse income and diversity shocks tend to dampen turnout. Estimates are larger at the lower tail of the income distribution, where a large negative income shock reduces turnout by 7.9%, and among poor elderly people whose turnout drops by 13.5%. The entry of a populist party induces a relative increase (decrease) in turnout among the poor (rich) who suffered an income loss.

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Keywords: Electoral Turnout, Administrative Data, Ethnic Diversity, Income Shocks

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1 Introduction

Understanding the determinants of voter turnout, both at individual and contextual level, has been a long-standing interest of politicians, scholars, and news commentators alike. Indeed, active citizens participation is essential to the well-functioning of a representative democracy and changes in the composition of the electorate may have major consequences for policymaking (see e.g., Vernby 2013; Fowler 2013; Madestam et al. 2013).

While studies about the demographic and socioeconomic profile of the electorate proliferated in the past few decades, what is largely overlooked is a clear insight into how eligible voters react to socio-economic shocks *directly* hitting them and the consequences of said shocks on *actual* voter engagement. This is mainly due to a lack of detailed individual-level data about who casts a ballot in an election coupled with fine-grained information on individual circumstances and their evolution over time.

In this work we exploit a unique administrative dataset that matches individual register and tax records from 2002 to 2013 with voter rolls covering four rounds of elections held in Bologna, a municipality in northern Italy, to investigate the impact of two shocks on electoral participation: (i) economic shocks, bringing about a sizable variation (positive or negative) in household income and (ii) close exposure to ethnic diverse groups, due to the arrival of immigrants from distant ethnic background in one's dwelling (henceforth, diversity shocks).[1] There is no reason to expect that all voters react in the same way to a shock: as we follow the universe of eligible voters over time, we can precisely uncover striking differences in the shock-turnout gradient over the income distribution, age and other attributes of the electorate, and in conjunction with changes in the political arena (e.g., the rise of a populist party, such as the Five Star Movement).

As far as income is concerned, while the widespread agreement is that voter turnout is higher among the rich than the poor, it is difficult to tease out whether it is income itself responsible for this difference or other correlated socio-economic factors, such as education, interest in politics, civic engagement, and turnout at elections. To address this issue, we exploit accurately measured individual income fluctuations in the year preceding an election to isolate the income effect.[2] A distinctive feature of our work is that we can measure short-term income shocks, both positive and negative, based on variations of eligible voters' income across consecutive years preceding an election, relative to those experienced by others in the same income bracket, which we take as reference to gauge whether a shock is sizable. These shocks are then considered as candidate drivers of actual individual turnout, together with income level and other socio-demographic characteristics.[3] By considering the universe of eligible voters in Bologna, we can investigate whether voters from the bottom quarter of the initial income distribution are more or less sensitive to negative (or positive) income shocks than their rich counterparts.

We uncover a positive income gradient in voter turnout and this relationship is highly heterogeneous across income classes. Negative income shocks tend to alienate all voters, but this effect fades away as income level increases. Furthermore, large positive shocks increase turnout only

[1] Elections held in Bologna are a suitable venue to examine whether income and diversity shocks play a role in a context historically characterized by profound civic engagement, as portrayed by (Putnam et al., 1994), and low level of segregation (ethnic groups are uniformly spread all over the city).

[2] Directly observing who casts a ballot, rather than voting intentions, addresses the usual concerns about measurement error in survey data. Moreover, differently from measures constructed from survey data, our income shocks are not vulnerable to misreporting and nonresponse.

[3] Due to lack of data, evidence on the effects of income shocks on individual turnout is scant. A notable exception is Schafer et al. (2022), who exploit a previous, less detailed version of our dataset and document that individual voter turnout falls substantially as income drops from some positive value to zero from one electoral year to the next, while the opposite transition has no effects.

among the poor. On the contrary, individuals placed at the top of the income distribution are not particularly sensitive to income shocks: if anything, when facing a large positive shock the probability of turnout decreases by one p.p. If we compare the response of these two groups, we see that eligible voters from the bottom quintile of the initial income distribution increase their participation by 7 p.p. compared to the top quintile who experienced a shock of the same relative size. The size of the effect is large and it reduces by one third the turnout gap between these two groups.[4] These findings are in line with the theoretical predictions of resource models of political participation (Brady et al., 1995; Rosenstone, 1982). As a threshold level of income is necessary for participation in politics, we might expect not only that income matters for turnout, but also that short-term economic adversity does: a sizable income loss just before elections may make citizens less likely to turn out to vote, especially if they are poor to begin with. Indeed, people facing economic strains may have little time to devote to politics and lose interest in it. On the contrary, positive income shocks should only mobilize the poor.

Recent studies have also highlighted the importance of local contextual factors in determining turnout - for a recent meta-analysis of the literature, see Smets and Van Ham (2013). Among these, following the surge in immigration flows to Western countries, local ethnic diversity has received increasing attention. A strand of studies (Bellettini et al., 2016, 2020; Dinesen and Sønderskov, 2016) lend support to a prominent view in political science (Alesina and La Ferrara, 2000; Putnam, 2007) that ethnic diversity in residential contexts may reduce social cohesion, trust and pro-social behavior, including political participation and turnout. Other works reach the opposite conclusion, that is the absence of a significant connection between diversity and turnout (Bhatti et al., 2017). All the aforementioned contributions rely on somewhat large contexts (e.g., census tract, precinct or some arbitrarily defined spatial unit) where, again, it is difficult to tease out the effect of local ethnic diversity from other characteristics of the communities. Thus, it is crucial to measure diversity at a sufficiently low level (such as at the building level) to ensure that voters' contact with ethnic others is unavoidable.

To this end, in this paper we exploit fine-grained geo-localized and longitudinal individual data to build a novel measure of personal exposure based on a change in the ethnicity of the next-door neighbor. In particular, we identify all buildings whose formerly only Italian residents experienced, in a pre-electoral year, a personal contact with ethnic others following the arrival of a household with at least one member of African or Asian citizenship (alternatively, with at least one non-OECD member), and we compare their decision to vote with that of those living in a residential unit of only Italians. We show that buildings are rather similar within a precinct and that the arrival of a foreign household is not correlated with the characteristics of the Italian households residing there. On these premises we leverage plausibly exogenous variation in personal exposure to ethnic diversity to investigate its association with the electoral participation of natives.

Exposure to ethnic others may have different effects across the income distribution, as less affluent electors may disproportionately fear the competition of immigrants in the labor market and in access to basic public services and/or feel that their interests are not well represented in the political spectrum.[5] We show that the diversity shock discourages electoral engagement. The magnitude of the effect decreases as income increases and is statistically significant only for the first three quintiles of the income distribution. For the richest group the estimate turns positive, albeit insignificant. After the exposure, the difference in the probabilities of casting a ballot for natives initially placed in the lowest and highest quintiles is about 3 p.p., which further increases

[4] Average turnout is 69% and 89% in the lowest and highest income groups, respectively. Other breakdowns of average turnout by age, gender, and electoral round are provided in the Appendix, Table A4.

[5] For instance, left-wing parties, which traditionally represent low-income voters' interests on redistributive issues, typically maintain a pro-immigrant stance that may demobilize the poor (Barone et al., 2016; Bellettini et al., 2020).

the turnout gap between these two groups by about 15%.

Finally, we exploit the fact that our data span multiple elections taking place before and after two major economic crises (the financial crisis of 2007/2008 and the European debt crisis of 2011) and before and after the entry of the Five Star Movement in the Italian political arena to examine the electoral response to the aforementioned shocks in different contexts.[6] Negative income shocks, especially during or after major economic crises, may fuel a sense of insecurity among voters and foster abstention, as a form of political protest, or support for populist parties (Guiso et al., 2017). We show that before entry of the Five Star Movement, following a sizable adverse income shock the propensity to alienation of the poorest is accentuated with the crisis (about 7.2 p.p. in 2008). This propensity markedly diminished after the Five Star Movement entry in the political arena (about 2.4 p.p. in 2013). The opposite trend is observed among the rich: the propensity to alienation is more marked after the change in the political arena (about 1.9 p.p. in 2008 vs 3.2 p.p in 2013). This finding seems to accord with a familiar armchair observation that the entry of a populist party after the breakout of crises might contribute to mobilize poor voters hit by adverse income shocks. Instead, the demobilization of the rich may reflect their desire to punish traditional parties.

The remaining of this paper is organized as follows. Section 2 gives an overview of the data, Section 3 sets up the empirical strategy, while the main results are presented in Section 4. Section 5 exploits data heterogeneity and Section 6 concludes.

2 Data

To identify the effects of socio-economics shocks on turnout we leverage a new dataset entirely retrieved from official administrative records and covering the universe of Bologna citizens. The dataset matches individual register and tax record data from 2002 to 2013 with individual turnout behavior of eligible voters across four consecutive elections (municipal elections were held in 2004 and 2009, national elections in 2008 and 2013), which leaves us with a sample of about 1.08 million observations. The official records contain information about place and year of birth, gender, marital status, country of origin, taxable income, and domicile of each citizen of Bologna and her household members.

Crucial to our empirical strategy for the identification of the effect of economic and diversity shocks on turnout are two specific features of the data. The first distinctive feature is the income history obtained from administrative records of declared taxable income. The availability of this information combined with individual voting participation allows us to study in depth individual income as a turnout determinant, by looking not only at income levels (as usually done in the economic and political science literature) but also at the role played by income fluctuations, either positive or negative, over time. From individual records, we can compute income fluctuations also at the household level and use the adjusted household income definition of the OECD to account for household composition.[7]

We first compute a year-on-year variation in household income levels to construct indicators of positive and negative income shocks, and of shocks of different size, pertaining different deciles of the income distribution. Specifically, let s_{jt} be the absolute value of the change in income between two consecutive years ($t-1$ and t) for a household j belonging to the *d-th* decile of the income distribution in year $t-1$, and z_d the standard deviation of the (absolute value of) the income

[6] The Five Star Movement is a populist party founded by Beppe Grillo, a former comedian, in October 2009. It often criticized austerity policies and advocated the introduction of a guaranteed minimum income scheme as a response to the increasing economic insecurity faced by the low-income class.

[7] See the Appendix for details regarding the construction of this variable.

shocks occurring in the *d-th* decile in year $t-1$. We then compare the magnitude of a single shock, s_{jt}, with its reference point, z_d, to construct a set of indicators of shocks of different sign and size. Specifically, we consider the absolute value of the size of a shock as i) large, when it exceeds z_d, both for negative and positive shocks (henceforth, L- and L+); ii) moderate, when it belongs to the interval $[0.5z_d, z_d]$, again both negative and positive (henceforth, M- and M+); and iii) negligible, when the magnitude is of a small entity, i.e., smaller than one half of z_d, and denoted by S_0.

Table A2 in the Appendix reveals a significant share of households being hit by an income shock across all income quintiles but in a different degree: 24% of the households at the bottom of the income distribution experience an income change in two consecutive years. This fraction steadily increases with income and it almost doubles in the top income quintile. Furthermore, the nature of a shock greatly changes across quintiles: the likelihood of a large negative shock is monotonically increasing across income quintiles, from zero in the first quintile to 16% in the fifth quintile. The reverse is true when we consider a large positive income shock (15% in the first quintile and 8.5% in the fifth quintile). A similar pattern is observed for moderate positive shocks.[8]

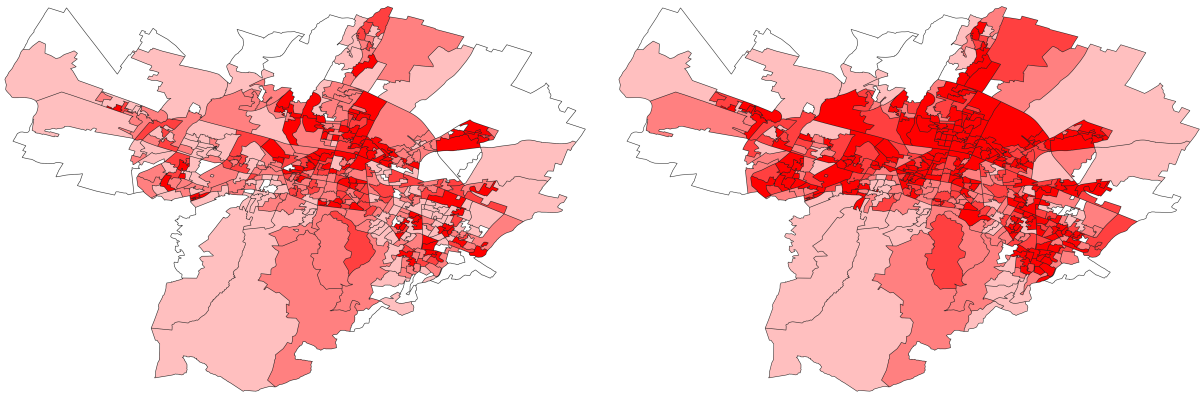
Equipped with this rich variation in income shocks across individuals and over time, we can assess the differential impact of income fluctuations for individuals who share similar income levels but have recently experienced different income shocks. Our findings will contribute to shed light on the long-standing question of whether and how income shocks may affect political participation. Previous empirical work of whether a poor economy depresses voter participation has generally yielded mixed results because of the lack of high frequency individual income data.[9]

The second distinctive feature of the dataset is that we can exploit longitudinal information about all households living in each building in Bologna to measure the exposure of eligible voters to ethnic diversity over time. Figure 1 displays the fraction of ethnically diverse buildings in the first and last electoral year for each precinct in our sample, where a building is considered ethnically diverse if it hosts at least one household with one or more members of Asian or African origin.

[8] The absence of large negative shocks in the first quintile is due to left-truncation.

[9] A few related contributions provide causal evidence that higher individual income has a positive effect on turnout in other contexts. Araujo (2021) identifies a substantial increase in voter turnout after the adoption of a basic income scheme in Brazil. Akee et al. (2018) show that the receipt of unconditional cash transfers increased children's voting propensity in adulthood among those raised in initially poorer families in rural western North Carolina, while parents' turnout was unaffected. De La O (2013) finds that targeted programs led to substantive increases in voter turnout in Mexico. Markovich and White (2022) provide evidence that in New York City higher minimum wage increased voter turnout among low-income workers by several percentage points. All these contributions rely on administrative data to measure changes in economic circumstances. In a comparative study using survey data from six countries, Jungkunz and Marx (2022) conclude that there are few significant short-term effects of income changes on political involvement. This finding, however, may suffer from measurement error. In this paper we take a step forward by examining the short-term effect of household income shocks on individual turnout along the income distribution, controlling for household income level. As argued above, our estimates are more robust as we rely on a unique panel of individual-level data from administrative sources.

Figure 1: Share of buildings with some ethnically diverse households



(a) Year 2004 (b) Year 2013

Note: Share of buildings with at least one household with one or more members of Asian or African origin, by precinct, in 2004 (panel a) and 2013 (panel b). The five shadings, from lighter to darker, correspond to 0–6%, 6%–12%, 12%–18%, 18%–24% and above 24%.

Two comments are in order here. First, this figure documents a striking change in the ethnic connotation of the city in a decade. By 2013, in almost all precincts, about 10% of the buildings hosted at least one ethnically diverse household, and in densely populated precincts such share exceeds one fourth. Second, unlike cities in the United States, there is no segregation and the presence of ethnically diverse households is spread all over the city.[10]

Exposure to ethnic diversity is not a prerogative of the poor. In fact, an important fraction of Italian households lives in ethnically diverse buildings, spanning from 28% in the bottom income quintile to 21% at the top of the income distribution - see the Appendix, Table A3. In ethnically diverse buildings, Italian households cohabit with an average of 14% of African and Asian households, and this is common to all income groups. In sum, a large number of individuals, spread across all income groups and precincts, is exposed to ethnic diversity, and increasing so over time.

Based on these considerations, the city of Bologna provides an interesting setting to study whether personal exposure to ethnic diversity plays a role even in a context historically characterized by strong political engagement and low ethnic segregation. To this end, rather than considering the usual stock variables based on shares of immigrants or transformations of the latter, we propose a novel micro-level measure of eligible voters' exposure to ethnic diversity. In particular, we exploit variation across voters on the arrival of an ethnically diverse household in an Italian-only building, an event which occurs in roughly 3% of our individual-year observations in our dataset.[11]

To the best of our knowledge, this is the first study that exploits variation in the exposure to ethnic diversity across buildings within a precinct. The number of precincts is 437 and the average number of buildings per precinct is about 73. A precinct covers rather narrow geographic areas and, while households' characteristics may vary considerably across precincts (e.g., average household income ranges from twelve to sixty thousand euros across precincts, see the Appendix, Table A1), they are rather similar within a precinct.

It is noteworthy that, within a precinct, the likelihood of the arrival of a household of Asian

[10] A similar trend emerges when we use a different definition of exposure to ethnic minorities from outside the OECD group.

[11] This percentage is quite stable across income quintiles (see the Appendix, Table A3, for details).

or African origin in a building tenanted by Italian households is not correlated with the average characteristics of the latter (i.e., gender ratio, share of individuals 65 years and older, average household income and average household size in the building) - see the Appendix, Section A.4 for more details. Hence, this evidence suggests that exposure to ethnic diversity is plausibly exogenous across buildings within a precinct. Since we are interested in studying the effect of a genuine exposure to ethnic diversity on turnout, we consider only eligible voters who did not change their domicile before an election in order to avoid any spurious correlation due to the choice of relocating. This leaves us with more than one million of individual observations.

Finally, we use information about all Bologna citizens to construct contextual variables that might be relevant in a turnout analysis, such as population density, average income, income inequality, share of females, share of children, and share of individuals over 60 in a precinct. A description of these variables is available in the Appendix, Section A.1.

3 Empirical Strategy

We model turnout with linear probability models that exploit the occurrence of income and diversity shocks across the income distribution. Formally, the estimation equation used for the income shocks is the following:

$$Turnout_{it} = \sum_{q=2}^{5} \alpha_q IncQ^q_{it-1} + \sum_{s=\{L-;M-;M+;L+\}} \beta_s Shock^s_{it} + \\ + \sum_{s=\{L-;M-;M+;L+\}} \sum_{q=2}^{5} \gamma_{qs} IncQ^q_{it-1} \times Shock^s_{it} + \\ + \delta X_{it} + \zeta_{nt} + \theta_p + \epsilon_{it} \quad (1)$$

while the estimation equation used for the diversity shocks is:

$$Turnout_{it} = \sum_{q=2}^{5} \lambda_q IncQ^q_{it-1} + \mu_1 Exposure_{it-1} + \mu_2 Exposure_{it-2} + \\ + \mu_3 Exposure_{it-1} \times Exposure_{it-2} + \sum_{q=2}^{5} \xi_{q1} IncQ^q_{it-1} \times Exposure_{it-1} + \sum_{q=2}^{5} \xi_{q2} IncQ^q_{it-1} \times Exposure_{it-2} + \\ + \sum_{q=2}^{5} \xi_{q3} IncQ^q_{it-1} \times Exposure_{it-1} \times Exposure_{it-2} + \\ + \nu X_{it} + \pi_{nt} + \tau_p + \eta_{it} \quad (2)$$

where i denotes the eligible voter and t refers to the election years: 2004, 2008, 2009, and 2013. The dependent variable in both specifications is $Turnout_{it}$, a binary indicator of individual electoral participation. Note that the shocks, and all other control variables, are also observed in-between elections and therefore we can exploit variation in their lags.[12] $IncQ^q_{it-1}$ are the dummies identifying

[12] In our previous related work (Schafer et al., 2022) in-between electoral years' information was not yet available and could not be used.

income quintile in the year before an election, and in Equation 1, $Shock_{it}^{s}$ are dummies for the four income shocks ($s = \{L-; M-; M+; L+\}$) that each individual experiences (S_0 being the baseline). The full set of interactions between the income quintiles dummies and the income shocks dummies identifies the heterogeneous effects of shocks along the income distribution. For example, the marginal contribution to turnout of a $M-$ (medium negative) income shock for an individual belonging to the second quintile of the income distribution is calculated, after estimation, as $\hat{\beta}_{M-} + \hat{\gamma}_{2M-}$.

Equation 2 includes dummies for the exposure of individual i to an ethnically diverse household in her building one year and two years before each electoral round ($Exposure_{it-1}$ and $Exposure_{it-2}$), together with the full set of their interactions with the quintile dummies and their cross interaction. Due to the presence of such cross interaction term (and all the interactions with quintile dummies), we can define the impact of the diversity shock, for each quintile, as the marginal effect of current exposure when past exposure is equal to 0. This corresponds to the effect on turnout of the arrival of at least one ethnic diverse household at time $t-1$, when at time $t-2$ no ethnic diverse household was present. For example, the impact on turnout of the diversity shock for an individual belonging to the third quintile of the income distribution is $\hat{\mu}_1 + \hat{\xi}_{31}$.

The estimation equations also include X_{it}, a set of time varying and time constant individual characteristics (age bins, sex, marital status, distance from the polling station), and (possibly time varying) covariates at different levels of aggregation: household (% of female, % children, % over65, number of household members), building where the voter lives (number of households in the building), and precinct (population density, mean household income, Gini Index, % females, % children and % over 65). The specifications include neighborhood-by-year fixed effects (ζ_{nt}, pi_{nt}), where n ($n = 1, ..., 9$) refers to the neighborhood of residence, as well as precinct fixed effects (θ_p,τ_p) where p ($p = 1, ..., 435$) denotes the voter's electoral precinct. Finally, ϵ_{it} and η_{it} are idiosyncratic error terms.

Although in principle feasible, we do not include individual fixed effects for two main reasons. First, we are interested in heterogeneous effects of shock variables across quintiles: the interacted specification is strongly supported by our results.[13] Introducing individual fixed effects in the interacted specification would heavily reduce the estimation sample since individual jumps over the income distribution across time are rare. Moreover, in the interacted specification, we are already exploiting – thanks to our shock variables - the existing time variation in income within each quintile. Second, we are able to insert the main effects of individual income, a crucial time varying regressor – rarely available in empirical studies of electoral turnout – which is likely to capture individual time-varying unobserved heterogeneity (related to personality traits, political interest etc.), therefore avoiding the black-box nature of individual fixed effects. The estimation is performed by means of OLS, with standard errors clustered at the individual level. The estimated coefficients are reported in the Appendix, Table A5. In the next section, we present and discuss the marginal effects calculated using linear combinations of the OLS coefficients.

4 Main Results

We present here the main results about the effects of income and diversity shocks on the individual probability of turning out to vote. To this purpose, we rely on Figure 2 where we plot marginal effects over income quintiles. In panel (a) results are shown for different types of income shocks, while panel (b) collects results for the diversity shock.

[13] Testing for constant effects of the shocks across quintile always leads to rejecting the null hypothesis.

By inspection of Figure 2 we uncover a positive income gradient in voter turnout and this relationship is highly heterogeneous across income classes. Moreover, the size of the income shocks (ranging from L- to L+) plays a role on individual electoral participation.

Positive income shocks matter only for the poor, but they do so only if large (L+). Notice that at the first quintile, the income shock L+ implies an increase in turnout of about 6 p.p. relative to receiving a negligible shock. The effect is quite large: it boosts turnout by 8.7% (average turnout is 68.9% at $IncQ^1_{it-1}$). Strikingly, this effect reduces by one third the turnout gap between electors at the bottom and the top income groups. This suggests that a substantial income gain can indeed boost electoral participation among those who struggle to meet ends. While we discern a positive effect also in the second quintile, it is half the size of the gradient estimated at the bottom of the income distribution.

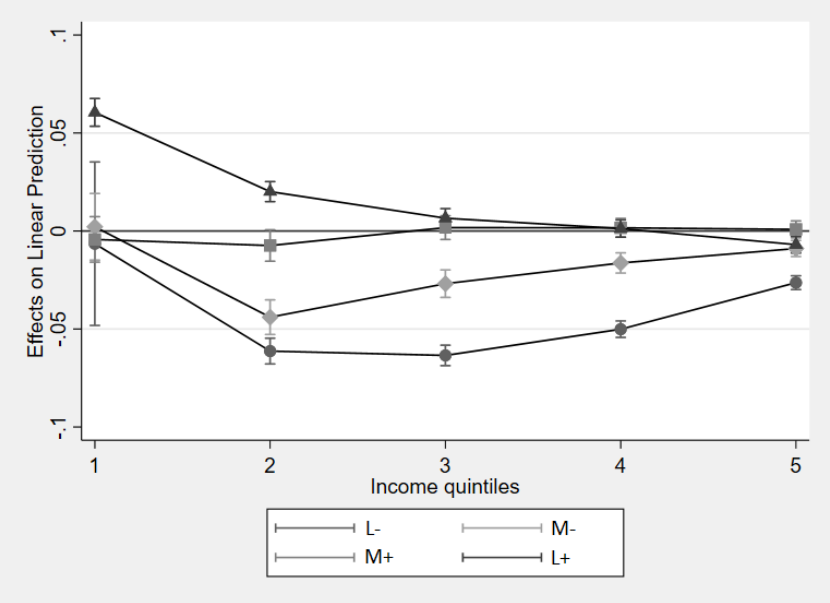
On the contrary, both large and medium negative shocks (L-, M-) negatively affect voters' turnout throughout the income distribution, with L- displaying a stronger effect at all quintiles. For instance, the estimated size is -6.1 p.p. for L- and -4.4 p.p. for M- at the second quintile. These figures are sizable: a large adverse shock reduces turnout by 7.9%, and a medium shock by 5.7% (average turnout is 77% at $IncQ^2_{it-1}$). Further, the effect fades away monotonically as income increases: at the fifth quintile the effect is still statistically different from zero but heavily reduced in size (-2.6 p.p. for L- and -0.9 p.p. for M-; average turnout is 89% at $IncQ^5_{it-1}$).[14] Consistently with the resource theory of political participation (e.g. (Brady et al., 1995)), our evidence points to an asymmetric role of positive and negative income shocks. In sum, while negative shocks hinder participation of all voters, with stronger effects in the bottom half of the income distribution, a positive one, if large enough, can mobilize economically disadvantaged voters.

We now turn to the results on the diversity shock, shown in Figure 2, panel (b). Here, the marginal effect measures the change in the probability of voting at time t induced by the arrival at time $t-1$ of an ethnically diverse household in a building where there were none at time $t-2$. The figure reveals marked differences along the income distribution: a diversity shock discourages electoral participation, with an effect that is statistically different from zero for the first three quintiles and stronger at the bottom of the income distribution, where the magnitude is -3.2 p.p.; then the gradient vanishes monotonically to zero after the fourth quintile. As in the case of adverse income shocks, we discern demobilization, which may be due to the fact that diversity fosters a sense of social alienation, possibly nested in the labor market condition, competition for health and child care, ethnic diversity in the classroom and/or cultural clash[15] (foreigners in Italy are in general competing with low-skilled, poor locals).

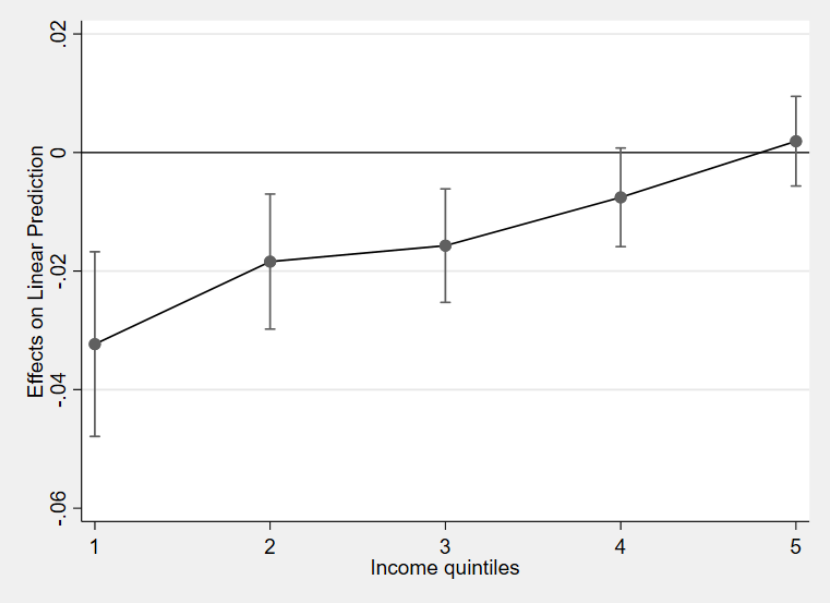
[14] The marginal effect at the first income quintile can be disregarded since negative shocks for poor people are very rare and therefore estimation of the marginal effects very imprecise, as standard error shows.

[15] Individuals with fewer resources, e.g. due to low education, may be less open minded towards people with different cultural values from their own (Alesina and Tabellini (2022) provide a comprehensive discussion of cultural versus economic forces as drivers of the political consequences of immigration). As we include household income quintiles in all specifications, these estimated effects are net of individual characteristics correlated with income, such as education, individual ability, etc.

Figure 2: Main effects



(a) Income Shocks



(b) Diversity Shock

Note: Marginal effects of income shocks (panel a) and diversity shock (panel b) on turnout along the income distribution, obtained from regressions 1 and 2, respectively. Table A.5 in the Appendix presents for the raw estimation results of the coefficients upon which the displayed marginal effects are computed.

5 Heterogeneous Effects

Adding an additional level of interactions in Equations 1 and 2, we now explore differences in the shock-turnout gradient over the income distribution by electoral round, age, and gender.[16] As for the income shock, we will focus on the large negative one (L-).

5.1 Electoral rounds

Figure 3 illustrates the results of a triple-interacted specification (shock×quintile×round) when the type of election is a municipal (panels a and c) or a national one (panels b and d), for both types of shocks: income (panels a and b) and diversity (panels c and d). Each regression is run only on the year in which the specific rounds of election took place.

Interestingly, for both types of elections, municipal and national, our time span covers one election before and after major economic crises: specifically, before and after the 2007/2008 financial crisis, for municipal elections, and before and after the 2011 European debt crisis, for national elections. Moreover, in October 2009, after municipal elections were held in Bologna, a new political force entered the Italian political arena, namely the Five Star Movement, a populist party founded by the former comedian Beppe Grillo. The Movement had no political stance on immigration but criticized austerity policies, advocating the introduction of income support schemes for those mostly hit by the crises and depicting itself as the new political opposition against left- and right-wing coalitions that alternated in power in Italy.[17]

By allowing for heterogeneous effects of our shocks by electoral round, we seek to capture demobilization/mobilization effects in the aftermath of crises and following the entry of an anti-establishment populist party in the Italian political arena.

A striking difference arises when evaluating the effect of the L- income shock at different electoral rounds. Specifically, although panel (a) shows no significant evidence of heterogeneous effects of the L- income shock across quintiles between 2004 and 2009 (albeit the estimated coefficient is 1-2 p.p larger in absolute value at the second and third quintiles in 2009, that is, post the financial crisis and before entry of the Five Star Movement), we spot a milder negative impact of the shock on the poor in 2013 (that is, post the debt crisis and after the entry of the Five Star Movement), relative to 2008. The opposite trend is observed for the rich (panel b). In particular, in absolute value, the coefficient of the L- income shock is approximately 5 p.p. *lower* in 2013 than in 2008 at the second quintile and 2 p.p. *higher* at the upper two quintiles.

When diversity shocks are considered, for both types of elections, there are mild to null heterogeneous effects by election round, both between 2004 and 2009 and between 2008 and 2013 (panel c and d).

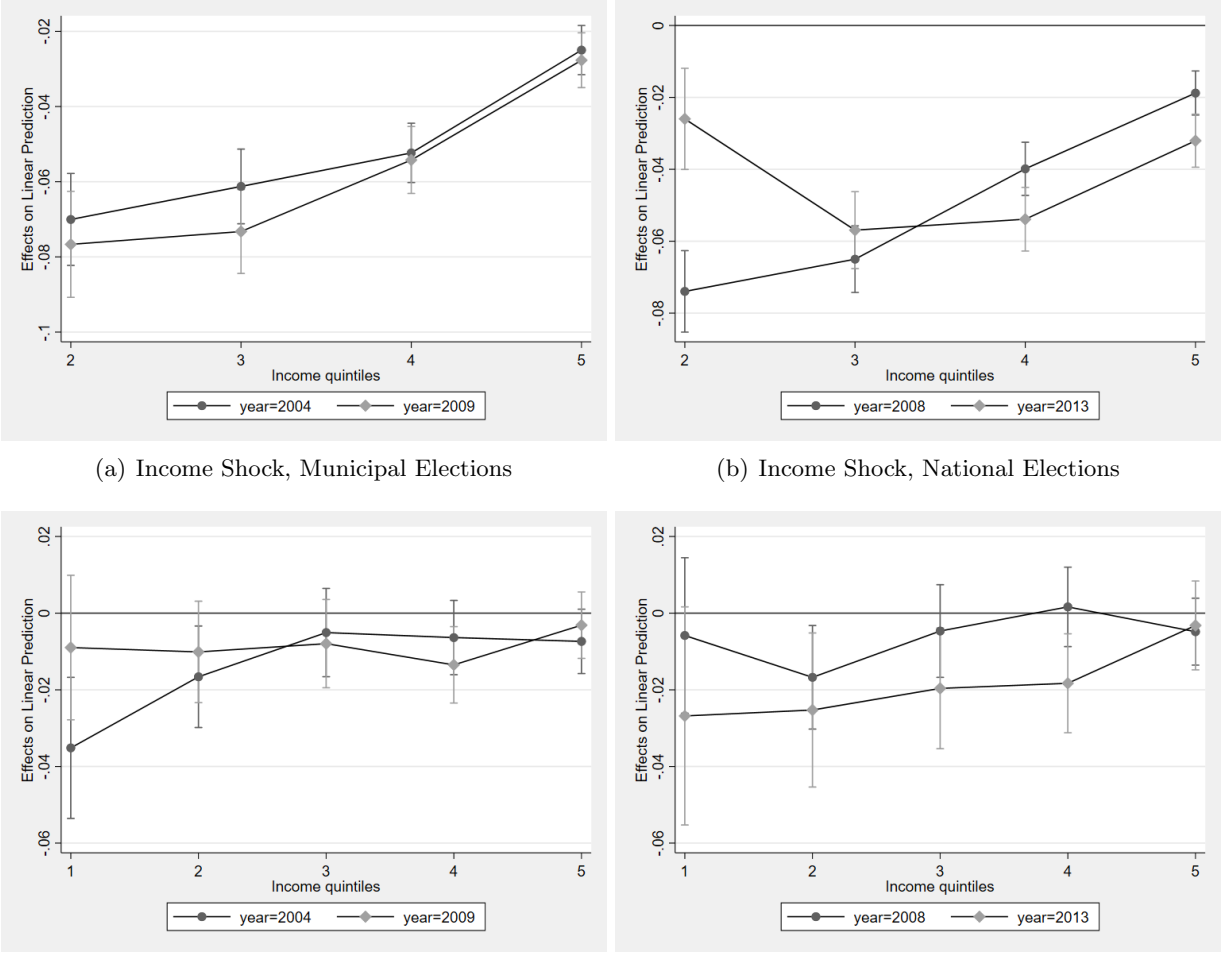
Overall these findings suggest that entry of the Five Star Movement, with its anti-party and pro-poor rhetoric, contributed to mobilize the most vulnerable, lower-income class voters in the aftermath of economic crises. Upper-income class voters, instead, were demobilized by the crises: they increasingly chose abstention to voice their discontent and punish traditional coalitions. Finally, the entry of the Five Star Movement and economic crises do not seem to change the probability to turn out to vote after experiencing a diversity shock. This may reflect the neutral stance of

[16] For example, when exploiting possible heterogeneous effects of diversity shocks by gender, the interaction of the female dummy with each term in Equation 2 will be added to the main estimation equation and marginal effects will be computed accordingly.

[17] After the end of the so called First Republic in 1992, when the "Clean Hands" investigation uncovered widespread corruption of parties and entrepreneurs, new electoral Laws to regulate both municipal and national elections were promulgated in Italy in 1993. These rules favor the formation and alternation into power of right and left-wing coalitions by introducing a majoritarian electoral system in place of the previous mainly proportional one.

the Movement on immigration and the fact that voters are worried by the presence of immigrants mostly for cultural rather than for economic reasons.

Figure 3: Heterogeneous effects by electoral round



(a) Income Shock, Municipal Elections

(b) Income Shock, National Elections

(c) Diversity Shock, Municipal Elections

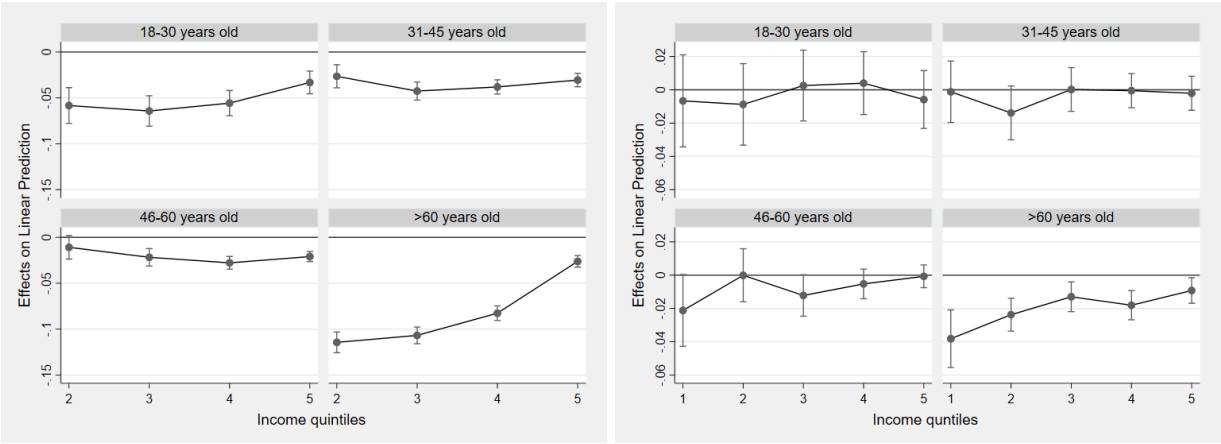
(d) Diversity Shock, National Elections

Note: Marginal effects of L- income shocks (panels a and b) and diversity shock (panels c and d) on turnout along the income distribution, by election years: municipal elections in 2004 and 2009, and national elections in 2008 and 2013, obtained from a regression where triple interactions between each shock, income quintiles and gender dummy are allowed.

5.2 Individual level heterogeneity

Breaking down demographic data, we document age disparities in turnout (Appendix, Table A4): 78% below age 30; 81% in the 30-45 group and over age 60; and it reaches its peak of 88 in the 45-60 age bin. In the case of a large negative income shock, the lion's share for the negative coefficient among the poor is due to voters aged 60 or more (panel (a), Figure 4). In particular, individuals at the bottom of the income distribution are quite sensitive to adverse income shocks: their probability of voting decreases by 11 p.p., that is, about 13.6% of the average turnout of people above 60. The effect fades away monotonically as income increases, but remains sizable up to the fourth quintile. Regarding the diversity shock (panel (b), Figure 4), we uncover a similar age profile but weaker in terms of size and statistical significance: poor elderly voters substantially drive the negative effect on turnout.

Figure 4: Heterogeneous effects by age

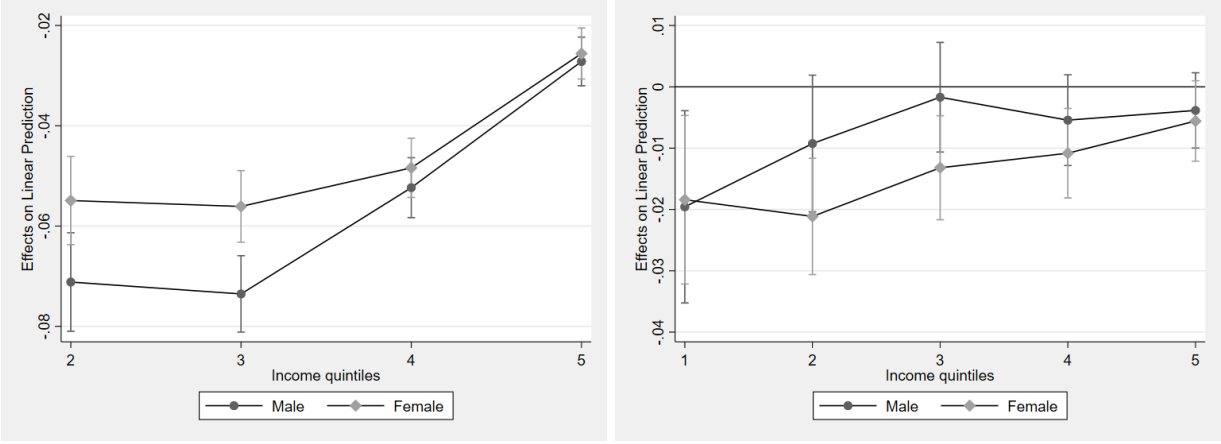


(a) Income Shock (b) Diversity Shock

Note: Marginal effects of L- income shocks (panel a) and diversity shock (panel b) on turnout along the income distribution by age bins, obtained from a regression where triple interactions between each shock, income quintiles and age bins dummies are allowed.

Interestingly, in our sample, male and female turnout is comparable: 84% and 81%, respectively. The negative response to the income shock is significantly larger among males until the third quintile (-7 p.p. vs. - 5,3 p.p., see panel (a), Figure 5). This may be due to the imbalance in the contribution to household income across spouses, where males (who typically contribute more) might be severely hit in terms of individual income.

Figure 5: Heterogeneous effects by gender



(a) Income Shock (b) Diversity Shock

Note: Marginal effects of L- income shocks (panel a) and diversity shock (panel b) on turnout along the income distribution, by gender, obtained from a regression where triple interactions between each shock, income quintiles and gender dummy are allowed.

6 Conclusion

Economic adversity is usually considered par for the alienation of voters and fear of immigrants might fuel the increasing support of populist parties. By means of a rich individual-level dataset merging longitudinal register, taxable income and turnout records of the universe of residents

in Bologna, a large municipality in northern Italy, this paper contributes to the literature on the socio-economic determinants of individual electoral turnout providing a fresh perspective on a long-standing issue which is crucial for healthy democracies, that is equality in political participation.

The availability of unique fine-grained geo-localized and longitudinal individual-level data allows us to work with new and very accurate measures of micro-level shocks on income and exposure to ethnic diversity as potential drivers of the electoral turnout of natives. By relying on administrative data, our estimates are not prone to measurement error which plagues analyses based on survey data.

In this setting we establish a set of compelling results that strongly support the "resource-based" theory of electoral turnout. We uncover a sizable negative effect of adverse income and diversity shocks on electoral turnout, whose magnitude is larger for less affluent and older voters. On the contrary, positive income shocks foster political participation among the poor. Although we restrict our attention to the Bologna case, this venue is particularly suitable to our study. At least since Putnam et al. (1994), Bologna is renowned for her profound civic engagement: our estimated effects can thus be taken as lower bounds that can be expected to be larger in other contexts.

Finally, we show that, following the entry of a new populist party in the political arena, the effect of negative income shocks on turnout is dampened for the poor and enhanced for the rich. Entry of a populist party contributes to mobilize poor voters when hit by adverse income shocks associated to economic crises, a result that is likely to generalize to other contexts. Instead, rich voters are demobilized by the crises and increasingly choose abstention, as the Five Star agenda is meant to capture the votes of the less affluent.

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A Online Appendix

A.1 Data Appendix

A compact list of the variables used in the analysis, their brief description, sources, and tables with relevant descriptives follow. Some of these variables are described in great details in Schafer et al. (2022). Subscripts h, b, and p indicate the level of aggregation (other than individual) at which variables are calculated: household, building and precinct level, respectively.

- **Turnout**: Dummy representing if the individual have been recorded at the poll station. This information is available for municipal elections in 2004 and 2009 and for national elections in 2008 and 2013, and have been hand collected from the Ministry of Interior's Bologna archive. They have been subsequently anonymously merged to administrative individual data by the municipality of Bologna's statistical office.
- **HH income**: Household income, measured in Euro, is calculated in several steps. First, individual incomes (made available to the municipality's statistical office by the Tax Authority) that are missing or equal to zero are set to the no-tax area threshold (ranging between 4186 euro in 2002 and 6518 in 2014). Then, the adjusted incomes of all members of a household are summed up and deflated by the consumer price index (base year 2002), and finally adjusted with the OECD modified scale. This scale assigns a weight of 1 to the household head, 0.5 to other household members aged 14 or older and 0.3 to those younger than 14. Within family, the summation of these coefficients is used as numerator when rescaling household income. In some cases we do not observe the HH income because nobody in the family filed taxes that year. It may occur for a number of reasons: a family who just moved to Bologna filed her taxes in her hometown (hence, we imputed income using information on her future income), or family income might be so low that they were exempted from filing. In the latter case, we imputed a minimum level required for survival.
- Age dummies for age bins 31-45, 46-60, and over 60.
- Female Dummy
- Dummies for Married, Divorced, and Widowed
- Number of Household Members (Household Members$_h$)
- Share of individuals from Non-OECD countries living in the building (% Non-OECD$_b$)
- Share of individuals from African and Asian countries living in the building (% Ethnic Others$_b$)
- Population density expressed as thousands inhabitants per square kilometer (Pop. density$_p$)
- Mean household income in the precinct (hh income$_p$)
- Gini Index of household income calculated in the precinct (Gini Index$_p$)

The following two tables show some statistics to describe income and diversity shocks. Table A2 reports, by quintiles of income, the distribution of Italian families experiencing no shocks and large and medium positive and negative shocks. While large negative shocks are absent for the first quintile of the income distribution due to left-truncation, the other shocks are evenly distributed, with richer people hit more on average: families in the first (fifth) quintile not hit by an income shock are more than 75% (less than 60%). Table A3 reports, by quintiles of income, the distribution of Italian families who have at least a family with ethnic diverse components living in their building, the share of ethnically diverse families within the building for those Italian families with at least a family with ethnic diverse components living in their building, and share of Italian families experiencing the arrival of a family with ethnic diverse components in their Italian-only building. Overall we see all these variables being quite balanced across quintiles, with just a slightly lower probability for rich people to live in the same building of ethnic diverse people. Note that the diversity shock only hits 3% or less of the families.

More disaggregated descriptives on turnout are reported in Table A4, where heterogeneity by income quintile, age and gender are taken into account.

Table A1: Descriptive statistics

	mean	sd	min	max
Turnout	0.83	0.38	0.00	1.00
HH income	28076.01	33682.60	5839.48	5752246
Age: 31-45	0.24	0.43	0.00	1.00
Age: 46-60	0.24	0.43	0.00	1.00
Age: over 60	0.43	0.49	0.00	1.00
Female	0.54	0.50	0.00	1.00
Married	0.54	0.50	0.00	1.00
Divorced	0.04	0.20	0.00	1.00
Widowed	0.13	0.34	0.00	1.00
Household Members$_h$	2.36	1.14	1.00	7.00
% Non-OECD$_b$	6.38	10.63	0.00	100.00
% Ethnic Others$_b$	3.29	7.94	0.00	100.00
Pop. density$_p$ (1,000/sqkm)	12.02	7.79	0.07	52.34
Mean hh income$_p$	24.24	6.54	12.01	59.79
Gini Index$_p$	0.39	0.07	0.25	0.66

Note: Sample used for the main estimations, totaling 1,081,141 individual-by-year observations, where years are 2004, 2008, 2009 and 2013. Subscripts h, b and p refer to household, building, and precinct level, respectively.

Table A2: Descriptives of income shocks

	(1)	(2)	(3)	(4)	(5)
Quintile	%HH S_0	%HH $L-$	%HH $M-$	%HH $M+$	%HH $L+$
1	.758	.004	.025	.054	.154
2	.630	.105	.052	.056	.154
3	.645	.122	.054	.066	.111
4	.609	.143	.071	.078	.098
5	.587	.159	.091	.076	.085

Note: Share of Italian families, by quintile of income, not experiencing income shocks (column 1), experiencing large (small) negative shock (column 2 (3, respectively)), and experiencing large (small) positive shock (column 4 (5, respectively)). See Section 2 for a detailed definition of income shocks.

Table A3: Descriptives of diversity shocks

	(1)	(2)	(3)
Quintile	%HH Exposed	Av. Exposure (if Exposure>0)	%HH Div.Shocked
1	.279	.143	.031
2	.266	.140	.028
3	.255	.136	.028
4	.237	.132	.027
5	.208	.130	.025

Note: Share of Italian families, by quintile of income, who have at least a family with ethnic diverse components (column 1) living in their building, share of ethnically diverse families within the building for those Italian families with at least a family with ethnic diverse components living in their building (column 2), and share of Italian families experiencing the arrival of the first family with ethnic diverse components in their building.

Table A4: Average turnout by groups

Quintiles		Age		Gender		Round	
Q1	0.69	Below 30	0.78	Male	0.84	2004 (Adm.)	0.85
Q2	0.77	30-45	0.81	Female	0.81	2008 (Gen.)	0.86
Q3	0.82	45-60	0.88			2009 (Adm.)	0.80
Q4	0.86	Above 60	0.81			2013 (Gen.)	0.81
Q5	0.89						

Note: Average turnout by groups. Sample used for the main estimations, totaling 1,081,141 individual-by-year observations, where grouping is done at the level of income quintiles, age bins, gender, and round of elections (administrative or general).

A.2 Estimated coefficients

Table A5 reports the results of the estimation of Equations 1 (left panel) and 2 (right panel) in the main text, used to compute the marginal effects shown in Figure 2 in the Section 4. For example, based on the results collected in Table A5, left column, the marginal contribution to turnout for a $M-$ (medium negative) income shock for an individual belonging to the second quintile of the income distribution is $\hat{\beta}_{M-} + \hat{\gamma}_{2M-}$=0.0022-0.0461=-0.0439. Alternatively, focusing on the results in the right column, the impact on turnout of the diversity shock for an individual belonging to the third quintile of the income distribution is $\hat{\mu}_1 + \hat{\xi}_{31}$=-0.0323+0.0166=-0.0157.

A.3 Robustness on diversity shock

As a robustness test for what concerns the ethnic shock, we rerun our main analysis (panel b of Figure 2) constructing dummies for the presence of foreigners not relying on the definition used in Caselli and Coleman II (2013), which stressed the visual identifiability of foreigners, (i.e. ethnic diverse people are those from Africa and Asia) but rather flagging foreigners as those of non-OECD origin. Results collected in Table A6 show two main differences along the income profile of individuals: compared to ethnic others (marginal effects reported in column 2 for comparability), diversity shocks constructed using non-OECD individuals show a flatter profile with respect to income, but negative for all the quintiles. This could reflect the fact that ethnically diverse immigrants in Italy are, on average, less skilled then the general population.

A.4 Drivers of diversity shock

In Table A7 we present a regression at the building level, restricted to the subsample of buildings hosting no foreign families. Dependent variable is the arrival of the therefore first foreign family in the building. As expected average family income plays a role (i.e. immigrants are less likely to move to buildings where average family income is larger), however when we look at the within-precinct level the income channel is muted, substantiating the identifying assumption of conditional random arrival of first foreign family used in the main analysis.

Table A5: Results of main specifications

Income Shocks			Diversity Shock		
VARIABLES	coeff.	s.e.	VARIABLES	coeff.	s.e.
IncQ=2	0.0723***	[0.0024]	IncQ=2	0.0507***	[0.0022]
IncQ=3	0.1167***	[0.0023]	IncQ=3	0.0890***	[0.0022]
IncQ=4	0.1464***	[0.0022]	IncQ=4	0.1162***	[0.0021]
IncQ=5	0.1616***	[0.0022]	IncQ=5	0.1339***	[0.0021]
L-	-0.0065	[0.0213]	Past Exposure	-0.0686***	[0.0101]
M-	0.0022	[0.0087]	Current Exposure	-0.0323***	[0.0079]
M+	-0.0043	[0.0059]	Past Exposure X Current Exposure	0.0718***	[0.0130]
L+	0.0605***	[0.0036]	Past Exposure X IncQ=2	0.0385***	[0.0126]
IncQ=2 X L-	-0.0548**	[0.0215]	Past Exposure X IncQ=3	0.0542***	[0.0119]
IncQ=2 X M-	-0.0461***	[0.0098]	Past Exposure X IncQ=4	0.0633***	[0.0115]
IncQ=2 X M+	-0.0031	[0.0072]	Past Exposure X IncQ=5	0.0827***	[0.0111]
IncQ=2 X L+	-0.0404***	[0.0044]	Current Exposure X IncQ=2	0.0139	[0.0098]
IncQ=3 X L-	-0.0570***	[0.0214]	Current Exposure X IncQ=3	0.0166*	[0.0093]
IncQ=3 X M-	-0.0290***	[0.0094]	Current Exposure X IncQ=4	0.0248***	[0.0090]
IncQ=3 X M+	0.006	[0.0067]	Current Exposure X IncQ=5	0.0342***	[0.0088]
IncQ=3 X L+	-0.0540***	[0.0044]	Past Exposure X Current Exposure X IncQ=2	-0.0455***	[0.0162]
IncQ=4 X L-	-0.0436**	[0.0214]	Past Exposure X Current Exposure X IncQ=3	-0.0512***	[0.0154]
IncQ=4 X M-	-0.0185**	[0.0091]	Past Exposure X Current Exposure X IncQ=4	-0.0568***	[0.0148]
IncQ=4 X M+	0.0059	[0.0064]	Past Exposure X Current Exposure X IncQ=5	-0.0862***	[0.0143]
IncQ=4 X L+	-0.0593***	[0.0042]			
IncQ=5 X L-	-0.0199	[0.0214]			
IncQ=5 X M-	-0.0111	[0.0089]			
IncQ=5 X M+	0.0051	[0.0063]			
IncQ=5 X L+	-0.0675***	[0.0042]			
Individual Level Controls FE	YES		Individual Level Controls FE	YES	
Precinct FE	YES		Precinct FE	YES	
Year X Neighborhood FE	YES		Year X Neighborhood FE	YES	
Household Level Controls X Year FE	YES		Household Level Controls X Year FE	YES	
Precinct Level Controls X Year FE	YES		Precinct Level Controls X Year FE	YES	
Observations	1081141		Observations	1081141	
R-squared	0.0653		R-squared	0.0635	

Individual-level OLS regressions, with the sample based on all those eligible voters that did not changed address over the 2003-2013 period. Dependent variable is a dummy indicating whether individuals voted at elections in year 2004, 2008, 2009 and 2013. Left (right) hand side results refer to the estimation of specification 1 (2) in the main text, with collinear coefficient in the interactions dropped by the estimation procedure. Controls are described in the main text and in Section A.1. Standard errors clustered at the individual level in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table A6: Marginal effects of diversity shock (Non-OECD and Ethnic Others)

	Non-OECD	Ethnic Others
1st quintile	-0.0239***	-0.0323***
	(0.0062)	(0.0079)
2nd quintile	-0.0207***	-0.0184***
	(0.0043)	(0.0058)
3rd quintile	-0.0163***	-0.0157***
	(0.0037)	(0.0049)
4th quintile	-0.0097***	-0.0076*
	(0.0032)	(0.0042)
5th quintile	-0.0059**	0.0019
	(0.0028)	(0.0039)
Observations	1081141	1081141

Note: Marginal effects of diversity shock on turnout as from the main analysis reported in Figure 2 (column 1) and by using the diversity definition based on non-OECD individuals (column 2). Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1

Table A7: Drivers of diversity shock

	(1)	(2)
VARIABLES	Diversity shock	Diversity shock
Average family income	-0.0310**	-0.0196
	[0.0129]	[0.0131]
Controls	YES	YES
Year FE	YES	YES
Neighborhood FE	YES	NO
Precinct FE	NO	YES
Observations	93,180	93,180
R-squared	0.0017	0.0130

Note: Building-level OLS regressions, with the sample being all those building-year observation where at $t-2$ all inhabitants are Italians. Dependent variable is a dummy flagging the arrival of at least an ethnically diverse person in $t-1$. Main explanatory variable is the average family income at the building level (in million euros), while controls are the average household size, the share of females and the share of people over 65. Standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1