Immigration and the fear of unemployment: evidence from individual perceptions in Italy.

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Abstract

We test whether natives correctly assess the effects of immigration on their own labour market opportunities. We relate self-reported job loss and job finding probabilities to the share of immigrants in the local labour market. We interpret coefficient estimates through the lens of a simple learning model that allows us to disentangle the true effect of immigration from the perception bias. Our results show that natives greatly overestimate the effects of immigrants on their labour market opportunities against substantially absent actual effects. This overestimation is very much concentrated among females, the low educated, the youths, and the residents in smaller towns. The remaining groups seem to correctly assess that immigration has at best modest effects on their labour market trajectories. We briefly discuss the implications of these findings for the interpretation of empirical work on the labour market effects of immigration.

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1 Introduction

In this paper we ask whether natives overestimate the effect of immigrants on their own labour market opportunities. In non competitive models of the labour market, beliefs and information about fundamentals define agents' behaviours such as, for example, effort provision for job search or on-the-job or acceptance rules for job offers. These in turn shape observable outcomes such as wages and employment status. Thus, holding incorrect beliefs or biased information has real effects and leads to sub-optimal choices and outcomes[1]; for example, a job seeker having too pessimistic views of the distribution of wage offers will lower her reservation wage; this will lead to an inefficiently high acceptance rate and a lower expected wage. Indeed, a broad body of evidence documents that in advanced countries natives are poorly informed about immigrants in their countries; they typically overestimate their amount and hold too negative views of their socio-demographic characteristics and behaviours [2]. Against this backdrop, to our knowledge little attention has been paid to the possibility that the labour market effects of immigration can be partly traced to the sub-optimal behaviour of misinformed agents rather than to traditional labour market mechanisms; empirical studies are typically cast within a standard competitive labour market framework in which wage and employment effects stem exclusively from the technological parameters governing the elasticity of substitution between different labour inputs and informational imperfections are implicitly assumed away[3].

Our empirical analysis is guided by a simple learning model. Agents form beliefs about their own future labour market opportunities combining a prior and available relevant data,

[1]See, for example, Conlon, Pilossoph, Wiswall and Zafar (2018), Mueller, Spinnewijn and Topa (2018), Spinnewijn (2015), Kassenboehmer and Schatz (2017), Dickerson and Green (2012)

[2]See, for example, Card, Dustmann and Preston (2005), Senik, Stichnoth and der Straeten" (2009), Grigorieff, Roth and Ubfal (2018), Alesina, Miano and Stantcheva (2018))

[3]For example, Card (2001), Borjas (2003), Ottaviano and Peri (2012). The few papers that study the effect of immigration within a non competitive labour market framework also implicitly assume perfect information about fundamentals. See Ortega (2000), Epstein, Kunze and Ward (2009), Moreno-Galbis and Tritah (2016), Battisti, Felbermayr, Peri and Poutvaara (2017), Chassamboulli and Palivos (2014), Iftikhar and Zaharieva (2019)).

for example recent local labour market developments. The prior embeds individual perceptions about immigration, which combine what the agent thinks about both the number of immigrants and their impact on his labour market opportunities; the observable data embed instead the actual effect of the true stock of immigrants. We show that the extent of overestimation can be recovered from a regression of perceived own labour market opportunities on measures of the true size of the immigrant population in the relevant labour market and on a rich set of observable predictors of own labour market outcomes.

We implement this specification using novel data on self-assessed future labour market transition probabilities collected by the Bank of Italy in its 2016 Survey of Household Income and Wealth. We relate these probabilities to the share of immigrants in the municipality, the smallest administrative unit in Italy. We address endogeneity concerns, whereby a better reported individual outlook might reflect unobserved positive labour demand shocks that also attract more immigrants, by means of a conventional IV strategy based on historical geographical settlements of immigrants by country of origin (Card (2001)).

We find statistically significant evidence that natives are too pessimistic about the effects of immigration on their opportunities. A one standard deviation increase in the share of immigrants in the municipality leads to overestimating the probability of losing one's job over the next 12 months by 4 percentage points and that of not exiting unemployment over the same horizon by about 6 percentage points. On average, overestimation accounts for nearly nine tenth of the overall effect of immigration on the perceived probability of losing one's job. We detect a lot of heterogeneity in perception bias, however. Residents of smaller towns, females, less educated and younger workers are quite pessimistic about the effects of immigration against at best weak negative effects of immigrants on their labour market trajectories. The complementary groups, instead, appear to correctly perceive the lack of substantial effects of a larger immigrant population in the local labour market.

We contribute to the literature in several respects. First, we raise the possibility that natives' behavioural responses to wrong beliefs may partly explain the labour market effects (or lack thereof) of immigration. Second, we propose an empirical method to infer the amount of misperceptions about the size and effects of immigration without directly observing individual assessments in this respect. Third, we use novel data on self-reported assessments of own labour market outlook collected without any reference to immigration. To the best of our knowledge, empirical studies of the effects of immigration have neglected the possibility of suboptimal native's behaviours stemming from biased information and all existing empirical research on natives' perceptions about immigration and its effects is based on replies to questions that explicitly refer to immigration and its effects on the broader economic outlook rather than on own conditions.

All in all, our main result that specific segments of the native population are excessively pessimistic about the consequences of immigration suggests that the occasionally detected correlation between their labour market outcomes and immigrant presence might be partly traced to the effects of wrong beliefs about immigration stimulated by a larger foreign presence rather than to standard market mechanisms.

2 A simple theoretical framework

Our goal is to assess how biased natives' opinions are about the effects of immigration on their personal labour market perspectives. We start out modeling a native's assessment of a specific future personal labour market outcome p_i, say the probability of losing the current job over the near future, as the result of a simple linear learning rule that combines available observable data relevant to this judgment (for example, recent separation probabilities in the relevant labour market, unemployment rate, etc.) with a personal prior $\tilde{p}_i$ unobserved to the econometrician.

Specifically,

$$p_i = \alpha \tilde{p}_i + (1 - \alpha) d_i \tag{1}$$

where for expositional purposes we let available observable relevant data be summarised by a single univariate index d_i.

Next, we introduce the possibility that natives misperceive both the size of the immigrant population in the relevant labour market and how it affects their own outcomes. Let X_m and $\tilde{X}_m$ be the true and the perceived sizes of the immigrant population in i' labour market, m. We let perceptions about the size of the immigrant population in the local labour market to be related in a flexible way to its true amount

$$\tilde{X}_m = \delta X_m + \xi_m, \quad \delta > 0 \quad \frac{cov(X_m, \xi_m)}{V(X_m)} = \sigma \geq 0 \tag{2}$$

allowing for the amount of misperception to increase with the actual immigrant population. Finally, we allow for the observed data and for the prior to be affected differently by the true and the perceived stock of immigrants, respectively

$$d_i = \theta_i + \beta X_m \tag{3}$$

$$\tilde{p}_i = \mu_i + \gamma \tilde{X}_m \tag{4}$$

where θ_i and μ_i summarize the actual and the perceived effects of own characteristics and do not necessarily coincide, $\mu_i = \theta_i + \epsilon_i$. For the sake of expositional simplicity, we also assume that individual determinants and the stock of migrants are uncorrelated ($cov(X_m, \theta_i) = cov(\tilde{X}_m, \mu_i) = 0$) and defer a discussion of endogeneity to section (4).

Equations (1)-(4) lay out a crude representation of the data generating process that can be used to guide the interpretation of regression results in section (4). In this representation, the parameters of interest are β and γ, the true and the perceived effect of a higher immigrant presence in the municipality on i's outcome, and δ and σ, the extent of misperceptions about the presence of immigrants in the municipality.

It is easy to show that the coefficient b_{total} of a simple bivariate regression of p_i on X_m, the true stock of migrants, yields the total effect of immigration on a native's assessment of her labour market outlook, $b_{total} = \beta + \alpha(\gamma(\delta + \sigma) - \beta)$, that is the sum of the true effect β and of the bias. The latter is simply the (weighted by α) difference between the perceived and true effect, where the former is given by the product of misperceived effect (γ) and misperceived extent ($\delta + \sigma$) of immigration on own employment perspectives. We use standard partitioned regression results to show that it is possible to disentangle the two effects by adding to the above bivariate regression the observed predictors of a native's labour market future outcome (d_i). The coefficient on the true stock of immigrants now represents an estimate of only the extent of misperception, $b_{bias} = \alpha(\gamma(\delta + \sigma) - \beta)$. Therefore the ratio of the two coefficients yields a measure of the relative importance of misperceptions about immigration in formulating own judgments about the personal labour market outlook.

This simple representation of the data generating process commands two considerations. First, we refer to the parameter β as the true effect of immigration. Clearly, this includes also the effects of the behavioural response of misinformed agents. To convey this intuition, consider a simple search model in which each period a job seeker receives a wage offer w drawn from a cdf $F(w)$. If she is correctly informed about F, she will set a reservation wage $w_F = u + \frac{\rho}{1-\rho}\int_{w_F}^{\infty}(1 - F(w))dw$, where ρ is the discount factor and u is utility from unemployment; if instead she believes wages are drawn from a worse cdf $G(w) \leq F(w) \quad \forall w$, because of a perception bias about the competition exerted by immigrants in the local labour market, she will set a reservation wage $w_G < w_F$. Her own assessment of the expected wage will then be $E(w|w \geq w_G; G)$, that is referred to the cdf G; this is lower than the observed ex-post mean wage, $E(w|w \geq w_G; F)$, that is referred to the true cdf F given the selected reservation wage w_G driven by the perception bias, which in turn is lower than the expected wage absent perception biases, $E(w|w \geq w_F; F)$. This example clarifies that immigration can have observable effects

$(E(w|w \geq w_G; F) - E(w|w \geq w_F; F))$ even if it does not affect fundamentals. In the model outlined by equations (1)-(4), β represents all observable effects of immigration, irrespective of their actual source.

Second, the estimated perception bias $b_{bias} = \alpha(\gamma(\delta+\sigma)-\beta)$ involves the strength of the prior, α, the overall perceived impact of immigration, $\gamma(\delta + \sigma)$, and the true effect of immigration β. Without further assumptions, it is not possible to learn about the single components from the data. Yet, it is possible to bound the overall perceived effect, $\gamma(\delta + \sigma)$, whenever the prior attracts a strictly positive weight. Let us begin by considering the case of a non-zero estimate of the perception bias, $b_{bias} \neq 0$. In this case, $\alpha = 0$ can be ruled out; moreover, $sign(b_{bias}) = sign(\gamma(\delta+\sigma)-\beta)$. Assume $b_{bias} > 0$; then $b_{bias} = \alpha(\gamma(\delta+\sigma)-\beta) \leq \gamma(\delta+\sigma)-\beta = \gamma(\delta + \sigma) - (b_{total} - b_{bias})$ so that $\gamma(\delta + \sigma) \geq b_{total}$, the overall perceived effect of immigration is at least as large as the estimated b_{total}. Analogously, if $b_{bias} < 0$ then $\gamma(\delta+\sigma) \leq b_{total}$. The case where $b_{bias} = 0$ is instead uninformative about whether there is no bias ($\gamma(\delta + \sigma) = \beta$) or the prior is inconsequential for individual beliefs ($\alpha = 0$). However, this latter case is not of interest: if the prior is given no weight in forming beliefs, then any potential misconception becomes irrelevant. It seems therefore reasonable to rule out this extreme case, thereby assuming that $\alpha \in (0, 1]$ so that if $b_{bias} = 0$ then $\gamma(\delta + \sigma) = \beta = b_{total}$.

3 Data

3.1 Opinions about own labour market outcomes

Our main dependent variable is drawn from the 2016 wave of the Bank of Italy's Survey of Households Income and Wealth (SHIW). The 2016 SHIW covers 7421 households interviewed from January 2017 to September 2017. Along with the the usual detailed information on income,

wealth and socio-demographic characteristics, the survey has collected novel information on individual perceptions of the likelihood of joblessness. Specifically, employed respondents are asked to assess the chances of retaining their current job over the next 12 months; unemployed and job-seeking employed respondents are asked to assess the chances of finding a job in the next 12 months. Replies are reported in terms of probabilities, on a scale 0-100. We restrict our attention to natives. The final sample consists of 3531 individuals, of which 2924 were employed at the time of interview.

In the empirical analysis individual replies are expressed in terms probability of losing the current job for the employed and of not finding a new job for the unemployed and for the job seeking employed.

Table (1) reports some descriptive statistics of the final sample. Employed respondents report quite high probabilities of losing their current job; job seekers are also quite pessimistic. A breakdown by individual characteristics shows more pessimistic perceptions on both events among the low educated, those that were previously unemployed and residents in the South and in small municipalities. Youths, those on temporary contracts and with low-skill jobs report higher probabilities of losing job. On the contrary, older individuals perceive a higher probability of not finding a job.

3.2 Predictors of individual outcomes

To assess the extent of misperceptions our empirical strategy requires reliable observable predictors of the events whose likelihood respondents are asked to assess. We therefore complement the rich set of individual observable characteristics collected by the SHIW with detailed descriptions of local labour market dynamics. Specifically, we focus on municipalities, the smallest administrative unit in Italy, and obtain municipality-level participation, employment and un-

employment rates from the 2011 population censuses. We further enrich the set of predictors with individual level municipality-specific estimates of annual labour market transition rates obtained from the Labour Force Survey (LFS). In particular, we exploit recall questions on one-year earlier labour market status and the duration of the current job or non-employment spell collected in the 2017 waves of the LFS to recover individual observed 2016-2017 transitions. We use these as dependent variables in probit models for the probability of losing one's job or of remaining jobless; explanatory variables include individual socio-demographics, 2001 and 2011 local labour market characteristics from population censuses and aggregate observed transitions in the municipality.

These predicted probabilities are then assigned to corresponding individuals in the SHIW that is those living in the same municipality and with the same observable socio-demographic characteristics. A more detailed description of the probit estimation and of the subsequent matching between LFS and SHIW is provided in Appendix A.

3.3 Immigration

Large immigration inflows in Italy are a relatively recent phenomenon in comparison with other European countries. The first sizable inflows begun at the end of the 80s, mainly from Africa, Philippines and Latin America. The composition of immigrants dramatically changed in the 90s and in the mid 2000s: as a consequence of the dissolution of the socialist block, the Balkan war and the European Union (EU) enlargement, the number of foreign citizens from Balkan and Eastern European countries remarkably increased. As shown in Figure (1-A), foreign-born residents in Italy represented 2.6% of total population in 2003 and 8.5% in 2018 (Istat data on resident population January, 1). The increase was mainly driven by the large inflows from Eastern European countries, while the growth of immigrants shares coming from the other areas remained relatively stable over the last two decades. In 2018 the first

five most important communities were from Romania (1,190,091 individuals), Albania (440,465 individuals), Morocco (416,531 individuals), China (290,681 individuals) and Ukraine (237,047 individuals).

Figure (1-B) shows that the geographical distribution of immigrants over the Italian areas is differentiated, with a larger concentration in Northern and Central regions. In 2018 the share of foreign-born living in Northern and Central regions was about 11% of total population, against 4% in Southern regions. More favourable economic conditions in North-Centre attracted foreign workers: Northern and Central regions account respectively for 58% and 27% of total foreign employment, while Southern regions represent 16%, according to the 2018 Labour Force Survey 2018.

The changes in origin countries determined changes in the composition of the inflow. Initially most immigrants were males working in construction and agriculture; the inflow from Eastern European countries led to an increase in female immigrants mainly employed in the service sector (1-C). In 2018, 52% of foreign-born were females. In the same year according to the Labour Force Survey, among foreign-born females employed, 88% worked in the service sector (driven by high concentration in personal services), 9% in industry and 3% in agriculture. Male employment was concentrated in the service sector (48%, driven by commerce services) and in the industrial sector (42%), followed by the agricultural sector (10%).

We measure the presence of immigrants by the municipality-specific ratio of foreign to Italian citizens resident in the municipality as of January 1st 2017. Data by municipality and country of origin are provided by Istat since 2003. Before that date, only the macro-area of origin of immigrants at municipality level is available.

We focus on municipalities, rather than on larger local labour markets comprising more than one municipality, to emphasize the role of proximity in shaping perceptions. Municipalities are

the smallest Italian administrative units. As of 2018 they are short of 8,000; 90 percent of them hosts at most 15,000 residents (and half of them at most 2,500). Smaller municipalities display on average a lower ratio of foreign to Italian citizens. However, foreigners are on average more visible in small centers than in large cities, where they are often concentrated in specific neighborhood. For example, in their study of the relationship between house prices and share of foreigners in urban districts, Accetturo, Manaresi, Mocetti and Olivieri (2014) show that foreign residents in the 20 largest Italian cities are highly concentrated: in 2010 the shares of foreign residents in the most immigrant-dense districts is on average about 4 times that recorded in least immigrant-dense districts. Therefore, in large municipalities most of the population is not significantly exposed to foreign residents while a small fraction experiences much more frequent interactions; in smaller municipalities, exposure is instead much more homogeneous.

4 Results

We implement the approach sketched in section (2) relating self-reported probabilities of losing the current job and of not finding one in the next year (p_i) to the ratio of foreign to Italian citizens in municipality m (X_m) with a simple linear regression model:

$$p_i = bX_m + \Gamma\Omega_i + \Lambda L_{i,m} + \nu_r + \epsilon_i \tag{5}$$

where Ω_i is a set of individual characteristics (sex, age, education, marital status, household size, income, years of previous unemployment, job tenure, job sector, occupational skills, municipality-level population), and $L_{i.c}$ a set of observable predictors of individual transition probabilities, including municipality-level structural labour market characteristics, a measure of labour demand developments in the local labour market and individual-municipality specific estimated labour market transition probabilities; ν_r are regional fixed effects and ϵ_i iid residuals.

Equation (5) can thus be mapped in the learning model sketched above noticing that under

the restriction $\Lambda = 0$, that is by excluding available predictors of future labour market outcomes, $E(\hat{b}) = b_{total} = \beta + \alpha(\gamma(\delta + \sigma) - \beta)$; similarly, the unconstrained regression yields $E(\hat{b}) = b_{bias} = \alpha(\gamma(\delta + \sigma) - \beta)$, that is only the perception bias with respect to the true effect β of immigration.

To address the potential endogeneity of the main explanatory variable X_m we construct an instrument based on historical settlements of foreigners by country of origin as, for example, in the seminal Card (2001) paper. Specifically, total foreign population in municipality m in 2017 is predicted assuming that the geographic distribution of cumulative inflows in Italy from each origin country c recorded over a long period of time is identical to the one recorded far back in time. This ensures that the increase in the number of immigrants in a given municipality does not reflect recent local labour demand shocks that also affect natives' individual labour market opportunities[4]. Formally, the instrument is defined as:

$$Z_m = \frac{\sum_c \theta_{c,m,2007} F_c}{(1+\mu) N_{c,2007}} \tag{6}$$

where $\theta_{c,m,2007} = \frac{F^{2007}_{c,m}}{F^{2007}_{c}}$ is the share of immigrants from country c residing in municipality m in 2007, a decade before our reference period, and $F_c = \Delta_c + F^{2007}_c$ is the total number of immigrants from country c in 2017. Analogously, the denominator is defined as the number of natives in 2017 had population growth in municipality m been equal to the overall growth μ (excluding foreigners inflows), so as to control for the potential endogeneity of mobility choices. Therefore, under the assumption that (conditional on the control set $\{\Omega_i, \nu_r\}$) the initial distribution of immigrants from a certain origin country across Italian municipalities is orthogonal to persistent unobserved municipality effects correlated with subsequent individual labour market transitions, IV estimates of the parameter of interest in (5) are identified out of exogenous variation in the share of immigrants and can be interpreted as suggested in

[4]Population registry data on foreign residents does not measure foreigners legally living in Italy but not recorded in population registries and foreigners illegally in Italy. However, under a reasonable proportionality assumption about the relationship between the stock of these two groups and the officially recorded stock of immigrants, this source of measurement error is accounted for in our empirical specification. See, for example, Bianchi, Buonanno and Pinotti (2012).

section (2). The main threat to the validity of the instrument is thus the possibility that the initial distribution of immigrants across Italian municipalities reflects persistent unobserved pull factors that also affect current labour demand. For example, sectoral specialization may influence both the amount and type of immigrants attracted to the local labour market and native' employment opportunities. To mitigate these concerns, we also include in the control set Ω a number of labour market indicators at the municipality level as of 2001. Specifically, we include municipality-specific participation, employment and unemployment rates and also construct a predictor for municipality-level aggregate labour demand in 2016 based on 2001 municipality-level sectoral specialization as $\sum_s q^0_{m,s} E_s$, where $q^0_{s,m}$ is the share of municipality m' total employment employed in sector s in 2001, and E_s is national employment in sector s in 2016 from the National accounts (Bartik (1991)).

Finally, we underscore that all our results are based on Jackknife Repeated Replication (JRR) estimates of the variance-covariance matrix. This has two advantages. First, there is no need to cluster standard errors at the municipality level. The potential correlation within primary sampling units (municipalities) is already accounted for by the JRR estimator. Second, this estimator of the variance is robust to outliers since replication weights are constructed iteratively dropping subsets of observations within primary sampling units.

Table (2) reports our main results. Panel A reports results for the perceived probability that an employed native loses her job over the coming 12 months; panel B focuses instead on that of (potentially employed) job seekers of not finding a job over the same period. In line with the discussion in section (2), columns (1) and (2) report OLS and IV results for estimates of equation (5) under the restriction $\Lambda = 0$, that is excluding available predictors of individual outcomes. The estimated coefficient of the share of immigrants, b_{total}, represents thus the sum of the actual effect of immigration and of the associated perception bias on own opportunities. In columns (3) and (4) we add a rich set of predictors for individual labour market

transitions; therefore, the coefficient b_{bias} now only reflects the misperceived component of the overall effect of immigration on own labour market opportunities. Specifically, we consider individual-specific estimated transitions in and out of employment at the municipality-level (see Appendix A1); also, we include [3] lags of annual employment changes in the local labour system (LLS) and LLS-level participation and employment rates in 2017 to capture recent labour demand developments relevant for the formation of individual expectations[5]. Finally, we also include municipality-level participation, employment and unemployment rates in 2011 from Census data.

First, consistently with the expected sign of the endogeneity bias, IV point estimates turn out to be higher than corresponding OLS ones although a formal Haussman cannot reject the null that the two coefficients are equal. Second, the two IV estimates can be combined as suggested in section (2) to yield a measure of the overall true effect of immigration on labour market outcomes in addition to the individual perception bias; the true effect is given by the difference between estimates in column (2) and (4) and the bias simply by the coefficient in column (4). As concerns the probability of losing one's current job, IV results suggest that the true effect of immigration is at best weakly positive ($\beta = b_{total} - b_{bias} = 0.8 - 0.7$) and that the perception bias ($\alpha(\gamma(\delta + \sigma) - \beta) = b_{bias} = 0.7$) accounts for most of the response of own assessments to immigration. Indeed, under the assumption that $\alpha \in (0, 1)$ a lower bound to the combination of perceived effect (γ) and perceived size ($\delta + \sigma$) can be estimated at 0.8. These results imply that a one percentage point higher share of immigrants in the municipality is perceived to increase the probability of losing one's current job by at least 0.8 percentage points against an estimated true increase of about one tenth of a point. On the contrary, immigration has a negative effect on the probability of not finding a job ($\beta = 0.5 - 1.0$) but

[5]Local labor systems are groups of neighbouring municipalities defined on the basis of commuting patterns so as to represent an integrated labour market. We rely on this broader concept of labour market because yearly data are available at the LLS level since 2006 while labour market data at the municipality level are available only at decennial census dates.

agents nonetheless display an unfavourable bias in their assessment. Again, one can show that the two point estimates imply $\gamma(\delta+\sigma) > 0.5$ against a true effect $\beta = -0.5 < 0$. This reading of the results rests on the assumption that specifications (3) and (4) are augmented with reliable and informative predictors of individual labour market transitions; a look at the associated R^2 suggests this is indeed the case. Overall, these results are consistent with the available evidence that on average immigration modestly improves or at best leaves unaffected natives labour market outcomes in advanced countries, including Italy[6].

The empirical literature has documented that immigration can have redistributive effects, however. Some groups of the population, those more likely to compete with foreigners and less able to upgrade to avoid this competition, end up suffering in terms of wages and/or employment opportunities while the rest may even benefit from a larger immigrant labour supply. In Table (3) we pursue a similar reasoning and document whether perceptions are heterogeneous across population subgroups. We only focus on perceptions about the probability of losing the current job; the small number of individuals reporting on the probability of finding a job do not allow meaningful stratifications of the sample. Results are very differentiated across groups. More immigrants are associated with a significantly higher perceived instability among females, youths, less educated and residents of small towns. Interestingly, these are the same groups in which recent papers find stronger misconceptions about immigration (Alesina et al. (2018), Grigorieff et al. (2018)). In all these cases, our simple model suggests that perceptions reflect at best only a weak true negative effect of immigration. For these groups coefficients in columns (a) and (b) are significantly different from zero but not statistically different from each other, so that the implied estimates for β, the true effect of immigration, are close to zero. In

[6]See for example, Card and Lewis (2005), Card (2009), Peri and Sparber (2009), Ottaviano and Peri (2012) for the US, D'Amuri, Ottaviano and Peri (2010), Dustmann, Frattini and Preston (2012), Glitz (2012), D'Amuri and Peri (2014), Cattaneo, Fiorio and Peri (2015), Foged and Peri (2016) for Europe, and Gavosto, Venturini and Villosio (1999), Venturini and Villosio (2006), Staffolani and Valentini (2010), Barone and Mocetti (2011) for Italy.

the complementary groups (more educated, males, older and living in large towns) coefficient estimates are instead not statistically different from zero, thus suggesting that perceptions are broadly in line with the absence of a substantial effect on own labour market perspectives.

Finally, the last panel of Table (3) splits the sample according to the degree of protection of one's job. Specifically, we estimate the effects of immigration separately for open end employees and self-employed workers[7]. Italian employment regulation awards extensive protection against dismissals to open end employees, while self-employed workers are not at all insulated from shocks to labour demand[8]. Consistently with the substantial difference in terms of exposure to competition faced by the two groups, our results suggest that the higher likelihood of losing one's job reported by permanent employees is entirely traceable to misperceptions about the role of immigrants; on the contrary, there is evidence that the self-employed, while overstating the role of immigrants in raising the odds of job loss, do face an actually higher likelihood of separation caused by a higher share of immigrants in the municipality.

5 Conclusions

Immigration is one of the major issues at the center of the political debate in advanced countries. Immigrants are felt to compete with natives along a number of dimensions at a time when resources are scarce: constraints to government spending severely limit the reach of welfare systems, the adoption of labour-saving technologies hampers employment opportunities of less qualified segments of the labour force, the secular growth slowdown raises concerns about

[7]We do not consider the few temporary employees present in the sample; the limited number of observations does not allow us to consider them separately and, at the same time, they are hardly similar to any of the two larger groups being considered.

[8]Italian employment protection regulation has undergone several changes over the past years. Among the most recent ones, protection against dismissals was reduced across the board for employees at larger firms in 2012 through a dramatic limitation of the cases for reinstatement after unfair dismissal; in 2014 newly hired employees were subjected to a further weakening of protections.

future living standards. This perceived competition is consistently detected by a number of social surveys, and goes hand in hand with sizable natives' misperceptions about the amount, characteristics and behaviours of immigrants.

In this paper we ask whether natives are too pessimistic about the effects of immigration on their own labour market opportunities. Answering this question is relevant since perceptions themselves do affect behaviours and outcomes; therefore, holding wrong views about immigration and its effects may have real effects even if fundamentals are largely unaffected by increases in foreign labour supply. Our inference is guided by a simple learning model describing how agents form their assessments of the probability of losing or finding a job; we implement it using novel data on Italian households' self-assessed labour market transition probabilities. The theoretical model shows how to jointly recover estimates of the true effect of immigration and of the perception bias about the effects and amount of immigrants from regressions of agents' beliefs on the observed share of immigrants in the labour market and on other predictors of labour market outcomes.

We find that on average natives significantly overestimate the impact of immigration. An increase of one percentage point of the share of immigrants leads to an increase of the perceived probability of losing one's job of at least 0.8 percentage points against a true effect of at most one tenth of a point. These effects are quite heterogeneous across the population. More educated, older and male natives appear to correctly perceive the (at best very weak) effects of immigration on their labour market trajectories; on the other hand, less educated, younger and female natives display sizable overestimation against still weak actual effects. As an indirect test of our empirical approach, we investigate separately the responses of permanent employees in highly protected jobs and those of self-employed workers, substantially exposed to labour demand volatility. We find that among permanent employees the entire empirical association between the probability of losing one's job and the share of immigrants is exclusively a reflection

of misperceptions; on the contrary, self-employed workers holding riskier jobs actually face an increased instability as the share of immigrants increase, although they also display a significant degree of misperception.

Overall, the evidence seems broadly in line with standard studies that look at observed labour market outcomes and that typically fail to detect significant effects of immigration.

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Table 1: Self-assessed likelihood of unemployment

	Probability of:			
	losing		not finding	
	Mean	SD	Mean	SD
All	15.4	(28.6)	59.8	(29.9)
Male	15.0	(28.7)	59.9	(31.8)
Female	15.8	(28.4)	59.7	(27.8)
Age<45	17.6	(29.5)	51.7	(29.1)
Age>=45	14.0	(27.9)	69.5	(27.9)
Lower education	16.5	(29.1)	61.7	(29.7)
Higher education	11.5	(26.3)	49.2	(28.9)
Married	13.7	(28.1)	62.0	(30.5)
Non-married	17.9	(29.1)	58.2	(29.4)
North	13.3	(27.2)	54.6	(31.0)
Centre	14.6	(28.6)	60.6	(28.1)
South	19.7	(30.5)	63.3	(29.3)
Small municipality	18.0	(31.0)	63.7	(30.2)
Medium municipality	15.7	(29.0)	58.2	(28.9)
Large municipality	11.2	(23.0)	59.2	(33.3)
Previous unemployment: yes	23.6	(30.6)	60.8	(29.6)
Previous unemployment: no	13.3	(27.6)	55.8	(31.2)
Permanent employee	13.3	(27.5)		
Temporary employee	35.3	(28.5)		
Self-employed	13.9	(28.9)		
Service sector	14.5	(28.4)		
Non-Service sector	17.7	(28.9)		
Low skill	17.0	(28.9)		
High skill	12.5	(27.7)		
Private sector	15.2	(27.6)		
Public sector	16.6	(33.6)		
Obs.	2924		682	

Table 2: Immigration and perceived labour market transitions.

	b_{total}		b_{bias}	
	No LM predictors		With LM predictors	
	(1)	(2)	(3)	(4)
	OLS	IV	OLS	IV
	A. Probability of losing job			
Share of immigrants	0.6***	0.8***	0.5**	0.7**
	(0.2)	(0.3)	(0.2)	(0.3)
Obs.	2802	2802	2802	2802
R^2	0.16	0.16	0.17	0.17
First-stage F-stat		857.9		708.7
	B. Probability of not finding job			
Share of immigrants	-0.1	0.4	0.4	1.1*
	(0.5)	(0.5)	(0.5)	(0.6)
Obs.	658	658	658	658
R^2	0.27	0.27	0.34	0.34
First-stage F-stat		206.2		243.9

Jackknife standard errors in parenthesis; replication weights used; *** p<0.01; ** p<0.05; * p<0.1.
All columns include sex, age, education, marital status, household size, income, years of previous unemployment, job tenure, job sector, occupational skill, municipal population, regional dummies, 2001 municipality-level Bartik and participation, unemployment and employment rates. Columns (3) and (4) also include predictors of labour market transitions: observed transition probabilities of losing job and of not finding job, 2011 municipality-level participation, unemployment and employment rates, 2017 local labour market level participation, unemployment and employment rates and 3 lags of percentage changes in local employment.

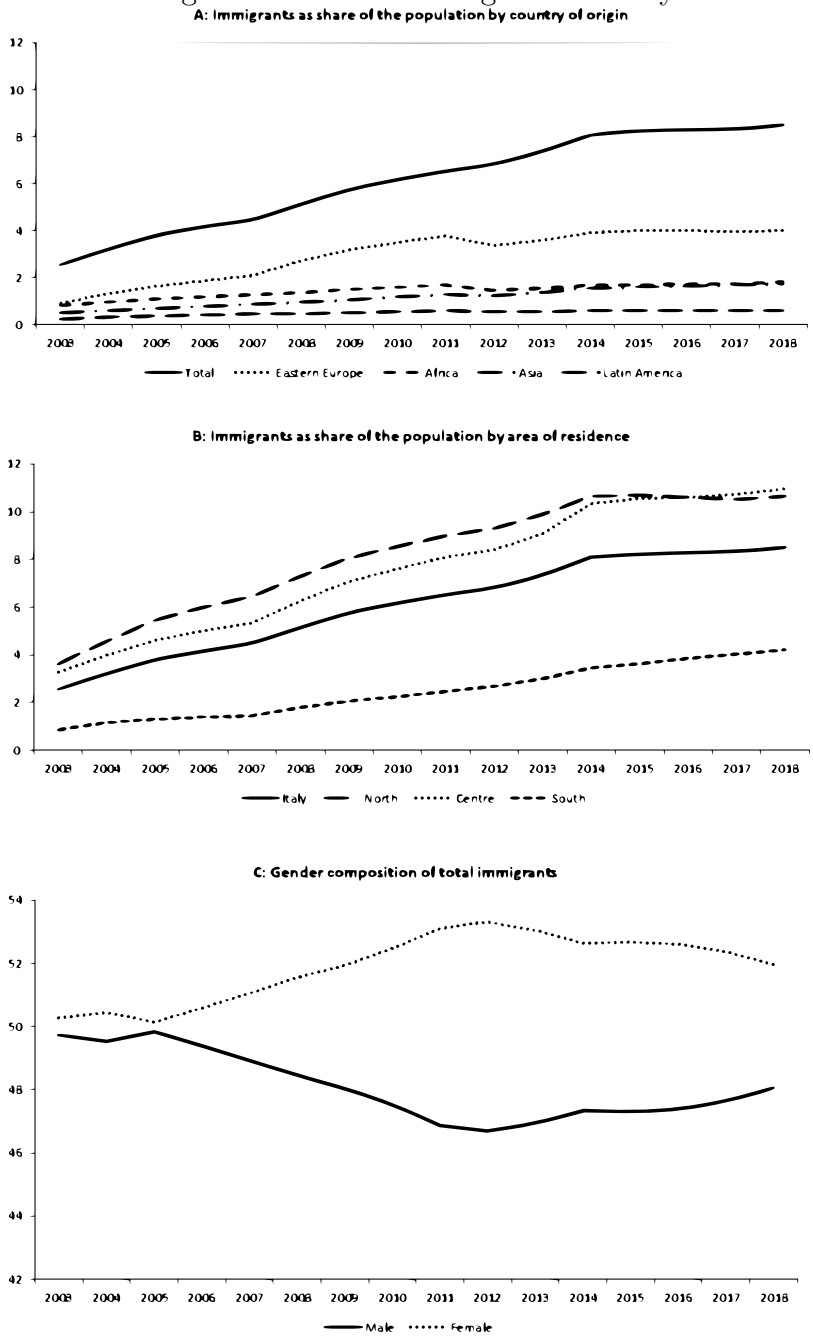
Table 3: Immigration and perceived job instability: heterogeneity.

	(a) b_{total}	(b) b_{bias}	(a) b_{total}	(b) b_{bias}
	Less than HS		HS or more	
Share of immigrants	0.9**	0.9**	0.1	-0.2
	(0.4)	(0.4)	(0.6)	(0.5)
Obs.	2223	2223	579	579
	Males		Females	
Share of immigrants	0.4	0.2	1.1***	1.0***
	(0.4)	(0.5)	(0.4)	(0.4)
Obs.	1598	1598	1204	1204
	Less than 45		45 or older	
Share of immigrants	1.1**	0.9**	0.6*	0.6*
	(0.5)	(0.4)	(0.4)	(0.4)
Obs.	816	816	1986	1986
	Small towns		Large towns	
Share of immigrants	2.0***	2.2***	0.2	0.0
	(0.5)	(0.5)	(0.4)	(0.5)
Obs.	1177	1177	1625	1625
	Open end		Self-empl	
Share of immigrants	0.8**	0.8**	1.1**	0.9*
	(0.4)	(0.4)	(0.5)	(0.5)
Obs.	1995	1995	559	559

IV estimates. Jackknife standard errors in parenthesis; replication weights used; *** p<0.01; ** p<0.05; * p<0.1.

Column (a) include sex, age, education, marital status, household size, income, years of previous unemployment, job tenure, job sector, occupational skill, municipal population, regional dummies, 2001 municipality-level Bartik and participation, unemployment and employment rates. Columns (b) also includes predictors of labour market transitions: observed transition probabilities of losing job and of not finding job, 2011 municipality-level participation, unemployment and employment rates, 2017 local labour market level participation, unemployment and employment rates and 3 lags of percentage changes in local employment.

Figure 1: Share of immigrants in Italy



Source: Istat, foreign residents by country of origin on January 1st.

A Matching SHIW and LFS

In order to obtain the realized transition probabilities from the occupational status in 2017 to that in the next year, we should use information on realized occupational status in 2018 of the same sample. However, the SHIW-2016 is the last available wave of the survey and no panel data are available. To this end, we make use of the Labour Force Survey (LFS) from the 2017, which provides recall occupational status in the previous year, and perform a statistical matching with SHIW-2016 to import the realized probability of losing job and of not finding job. The LFS is provided on a quarterly basis by Istat and constitutes the official statistics on the Italian labour market aggregates.
We use this data source for two reasons: first, it includes recall data on the occupational status in the previous year, allowing for the estimation of realized transition probabilities; second, the survey characteristics are comparable to the SHIW so that a statistical matching between the two sources is reasonable. However, an important assumption should be made: we use realized transition probabilities from the occupational status in 2016 to that in 2017 as a proxy for the realized transition from the occupational status in 2017 to that in 2018[9], assuming that the labour market aggregates did not change between the two periods. As shown in Table (A1, this seems a realistic assumption as labour market aggregates remained fairly stable.

Table (A1) summarizes the silent characteristics of the two surveys along with the occupational status gathered from the SHIW and from the LFS, in order to check whether the preliminary conditions for a statistical matching are met, i.e. samples drawn from the same population, comparable sampling design and similar distribution of the variable of interest. The reference population, the sampling design and the reference units (primary and secondary) are very similar between the two data sources. The occupational status in the SHIW is self-declared by the household members, while the LFS provides both the self-declared status and the occupational status defined according to the International Labour Organization (ILO) standards[10]. The table shows that self-declared status in the SHIW and in the LFS are very similar, whereas the percentages of individuals out of labour force defined according to the ILO standards are quite different. In fact, the latter definition is characterized by higher incidence of individuals out of labour force and lower share of unemployment than the self-declared status in the two

[9]Ideally, we should use LFS from the 2018 in order to obtain realized transition probability of losing job and not finding job from 2017 to 2018. However, we have available information on the municipality where respondents reside only for LFS-2017.

[10]Occupational status according to the ILO standards: employed individuals are defined as those of working age who i) worked for at least one hour in the last week in any activity for pay or profit ii) worked for at least one hour in the last week without pay in family enterprise iii) temporary not at work in the last week, but had a job (maternity, sick leave, etc.); unemployed individuals are those of working age who i) were not in employment, carried out activities to seek employment in the previous 30 days and were currently available to take up employment in the subsequent two weeks ii) were starting a job in the subsequent three months and were available to take up employment in the subsequent two weeks; inactive individuals are those out of the labour force, i.e. those not in employment nor in unemployment.

surveys. This is due to the fact that the ILO definition considers out of labour force also those who i) did not actively seek a job but were available to work ii) actively seek a job but were not available to work. However, these individuals self-declared to be unemployed. From this table we can conclude that the self-declared status from the LFS should be preferred to the ILO definition, and that we can rely on shares of employed, unemployed and inactive by geographic area and sex very similar between the SHIW and the LFS.

The matching between SHIW and LFS is performed at the municipality level and controlling for individual demographic characteristics that are homogeneous between the two data sources. In particular, it is conducted through two steps: first, we estimate the realized transition probabilities at the individual level and in each municipality, controlling for sex, age and education, using the LFS sample. In this way, we obtain the realized transition probability for each possible combination of sex, education and age in each municipality. Second, we match LFS and SHIW at municipality level and the estimated transition probabilities in each matched municipality are attributed to individuals in the SHIW with the same combination of sex, age and education. Thanks to the similar sampling design, about 68% of municipalities in the SHIW are also present in the LFS. For the remaining individuals residing in municipalities that are not also in the LFS, we attribute the realized transition probability through the propensity score matching. In particular, the propensity score matching is performed within each Italian region and it associates each observation in the SHIW with the most similar observation in the LFS, in terms municipal population size, municipal immigrant rate, sex, age and education.

Table A1: Labour market outcomes in SHIW and in LFS

	(1)	(2)	(3)	(4)	(5)
	SHIW 2016	LFS 2018		LFS 2017	
Occupational status	Self-declared status in 2017	Self-declared status in 2018	Self-declared status in 2017	Self-declared status in 2016	ILO status in 2017
All					
employed	36.8	38.1	37.5	36.9	38.0
unemployed	10.7	8.7	9.4	9.7	5.0
out of labour force	52.5	53.2	53.2	53.4	57.0
North					
employed	41.4	43.4	42.8	42.3	43.4
unemployed	7.1	5.1	5.5	5.9	3.3
out of labour force	51.4	51.5	51.6	51.8	53.3
Centre					
employed	39.5	40.9	40.2	39.4	40.8
unemployed	9.4	7.2	7.8	8.3	4.6
out of labour force	51.1	51.8	52.0	52.2	54.6
South					
employed	29.0	29.4	28.7	28.3	29.3
unemployed	16.2	14.4	15.3	15.5	7.4
out of labour force	54.8	56.2	56.0	56.2	63.4
Male					
employed	43.7	45.4	44.8	44.2	45.3
unemployed	11.6	9.8	10.4	10.8	5.4
out of labour force	44.7	44.9	44.8	45.0	49.3
Female					
employed	30.2	31.2	30.5	30.0	31.1
unemployed	9.9	7.7	8.3	8.6	4.5
out of labour force	59.9	61.0	61.1	61.4	64.4

Table entries are percentages of population in a given labour market status. Cols.(1)-(4) refer to self-defined condition; col.(5) refers to ILO definitions. Col. (1): SHIW, conditions as of February-march 2017; cols. (2)-(x): LFS, conditions at time of interview; cols. (x): LFS, retrospective conditions.
Reference population is residents in households.