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There Goes the Neighborhood? People's Attitudes and the Effects of Immigration to Australia

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Abstract

This paper compares the effects of immigration flows on economic outcomes and crime levels to the public opinion about these effects using individual and regional data for Australia. We employ an instrumental variables strategy to account for non-random location choices of immigrants and find that immigration has no adverse effects on regional unemployment rates, median incomes, or crime levels. This result is in line with the economic effects that people typically expect but does not confirm the public opinion about the contribution of immigration to higher crime levels, suggesting that Australians overestimate the effect of immigration on crime.

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Keywords: International Migration; Effects of Immigration; Attitudes towards Immigrants

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1 Introduction

The size and composition of immigrant flows may have strong economic and non-economic effects on immigration countries. Immigration policies are designed to regulate these flows and to shape the immigrant population. These policies do not only depend on potential effects of immigration but also rely on the public sentiment regarding immigration. In particular, perceived negative aspects of immigration seem to receive more public attention than positive aspects (Card et al., 2005), suggesting that attitudes towards immigrants can be negative, even if they have a positive impact on their host country.

While numerous studies have examined the effects of immigration and the factors that determine the public opinion towards immigration, very little is known about the relationship between actual and perceived immigration effects. Against this background, this paper compares economic and social effects of immigration to the public opinion about these effects. We take advantage of the opportunity to combine several Australian data sources at individual and regional levels, which allows us to compare actual and perceived effects of immigration. We employ an instrumental variables strategy to account for non-random location choices of immigrants when estimating the regional effects of immigration.

We are particularly interested in addressing the following questions: First, how does the Australian population perceive immigration? Second, to what extent does immigration determine people's attitudes towards immigrants? Third, does immigration affect economic and social outcomes? Fourth, what is the relationship between immigration effects and people's attitudes? Addressing these questions is highly relevant because actual effects of immigration may be very different from the public perception of these effects. By comparing actual and expected effects of immigration, we may draw inferences about the extent to which people over-/underestimate actual effects.

People's attitudes depend on a variety of economic and non-economic factors and empirical studies have come to different conclusions regarding the relevance of these factors. While some studies have found that economic factors – such as labor market or fiscal effects of immigration – influence individual attitudes towards immigration (Bauer et al., 2000; Scheve and Slaughter, 2001), other studies have highlighted the relative importance of non-economic factors (Espenshade and Hempstead, 1996; Citrin et al., 1997; Card et al., 2005; Mayda, 2006). Our study focuses on the extent to which individual attitudes are influenced by immigration into neighborhoods. We are able to control for a number of individual- and neighborhood-specific characteristics and we employ an instrumental variable strategy and estimate models with region fixed effects to account for unobserved heterogeneity caused by non-random sorting of immigrants across regions.

A major strand of the economic migration literature has analyzed the effects of immigration on labor market outcomes of less-skilled natives and often found small or no effects on wages and employment (Friedberg and Hunt, 1995; LaLonde and Topel, 1996; Borjas, 1999, 2003; Longhi et al., 2005; Zimmermann, 2005). Many studies have used regional variation in the population share of immigrants to estimate labor market effects of immigration and addressed the problem of non-random location choices by using instrumental variables or data of historically unique events (Card, 1990; Altonji and Card, 1991; Hunt, 1992; Card, 2005; Bauer et al., 2011). While most of these studies have analyzed immigration to the U.S. and Europe, less is known about the consequences of immigration to other traditional immigration countries, such as Australia. This is unfortunate because source countries and policies used to select immigrants have differed considerably across immigration countries.

Our objective is to utilize regional variation to estimate the effects of immigration to Australia on economic and social outcomes. Australia is an interesting example for the analysis of immigration effects because the Australian immigration experience did not only affect the composition of the immigrant population but also shaped the nation as a whole. The Australian immigration policy has historically focused on the

immigration of workers from Europe, following a "White Australia Policy" by accepting mainly immigrants from Britain and expanding immigration to other European countries to fill a labor shortage resulting from the Second World War. Immigration policies have changed considerably since the introduction of the first immigration program in 1947 (Collins, 2006). Australia moved away from selecting immigrants on the basis of national origin in 1973 and placed a relatively high weight on accepting skilled immigrants. Numerical scores were used as an administrative arrangement since 1979 and a points system was formally introduced into law in 1989 (Chiswick and Miller, 2006). The immigration experience since the Second World War has shaped the size and ethnic composition of Australia's population. In 2010, about 27% of the Australian population was foreign-born (ABS, 2011a). Due to the focus on immigration of skilled workers from around the world in recent decades, immigration to Australia is relatively skilled (DIAC, 2010), especially compared to immigration to the U.S. and most European countries (OECD, 2010).

The findings of our empirical analysis suggest that Australia's strategy of linking immigration to the demand for labor has been very successful and appears to be widely accepted in the population. We find that immigration into a region has no adverse effects on unemployment rates, median incomes, or crime levels of that region. This result is consistent with the economic effects that people typically expect but does not confirm the public opinion about the contribution of immigration to higher crime levels, suggesting that Australians overestimate the effect of immigration on crime. The large share of immigrants who reside in regions with relatively high crime levels could be a possible explanation for this misperception. Our findings further suggest that both an instrumental variable strategy and region fixed effects are needed to account for non-random sorting of immigrants into regions.

The remainder of this paper is organized as follows. Section 2 describes the data sources that are employed in our analysis. Our empirical strategy is explained in Section 3. Section 4 presents the empirical findings and Section 5 concludes.

2 Data

We use several data sources in our empirical analysis that allow us to compare the effects of immigration on unemployment, income, and crime to people's opinion about these effects. Attitudes towards immigrants were surveyed as part of the Australian Election Study (AES). The AES surveys provide data on the dynamics of political behavior of Australians. The surveys are designed to collect data during federal elections for academic research on Australian electoral behavior and public opinion. Surveys were undertaken in 1987, 1993, 1996, 1998, 2001, 2004, and 2007 and each survey includes a nationally representative sample of about 2,000-3,000 voters.[1,2]

We focus on three questions about attitudes towards immigration. Specifically, survey participants were asked (1) whether immigrants take jobs away from Australian-born workers, (2) whether immigrants are generally good for the economy, and (3) whether immigrants increase crime. We further employ a set of background variables, including the level of education, employment and marital status, gender, age, and income. We restrict our analysis to Australian-born persons aged 18 years or above and focus on the years 1996 and 2001 because the surveys include postcode information of respondents and because the two years coincide with Australian Census years.

We employ regional level data from the Time-Series Profile of the Australian Censuses 1996, 2001, and 2006. This data source includes local unemployment rates, median income levels, the median age, the size of native- and foreign-born populations, and occupational and educational distributions. Statistical Local Areas (SLAs) are the smallest geographical unit identified in the data. They are used by the Australian Bureau of Statistics (ABS) as a general purpose spatial unit. SLAs are slightly larger than postcode regions and cover the whole of Australia without gaps or overlaps.[3]

We may not only use SLA level Census data to estimate immigration effects on

[1]Voting in Australia is compulsory.

[2]The data are publicly available from the Social Science Data Archives of the Australian National University (http://ssda.anu.edu.au/).

[3]There are about 1,500 SLAs and about 2,500 postcode areas in Australia.

unemployment rates and median income levels but we may even combine Census data with individual attitudes. The ABS provides concordances that allow us to convert data from SLAs to postal areas, which constitute ABS approximations of Australian postcodes (ABS, 2006a,b). We use these concordances to combine Census data with the AES surveys in 1996 and 2001. The resulting dataset may be used to study the relationship between individual attitudes and regional characteristics.

Our third data source includes crime statistics from state and territory governments in Australia, which cover about 99% of the Australian population.[4] Crime statistics in Australia are held at the Local Government Area (LGA) level. Since LGAs comprise one or more whole SLAs, we may combine LGA level Census data with crime statistics to perform our analysis of immigration effects on crime. The crime statistics include the number of crimes that were committed in each Local Government Area (LGA) within a year. We use the (log of) the annual total number of crimes per 1,000 persons as a dependent variable in our analysis. The total number of crimes is defined as the sum of the following crime categories: "Homicide and Related Offences", "Sexual Assault and Related Offences", "Abduction and Related Offences", "Robbery, Extortion and Related Offences", "Burglary (including intent)", "Theft and Related Offences", "Deception and Related Offences", "Illicit Drug Crime", and "Weapons and Explosives Offences". We do not include minor offences, such as "Public Order Offences" and "Traffic Offences".[5]

2.1 Attitudes

International comparisons based on the International Social Survey Programme (ISSP) 2003 suggest that only three out of a list of 27 OECD countries have a more positive average opinion towards current immigration flows than Australia (OECD, 2010). Al-

[4]We are grateful to Andrew Leigh for providing access to the data. Cornaglia and Leigh (2011) describe the data in detail.

[5]As part of our empirical analysis, we use two alternative definitions with and without "Illicit Drug Crime" because this category includes both minor and major crimes. Since this change in the definition of the dependent variable does not affect our results qualitatively, we only present the results of the definition including this category.

though overall attitudes of Australians towards immigration flows may be considered as relatively positive in an international context, attitudes may still vary substantially across economic and social dimensions. Table 1 reports expected economic and social immigration effects of the Australian-born population. Almost 40% of the people in 2001 and about 33% in 2006 think that immigrants take jobs away from Australian-born workers. While about 28% of the respondents neither agrees or disagrees with that statement in both years, about 32% in 2001 and 39% in 2006 disagrees or strongly disagrees. These numbers suggest that Australians have rather mixed expectations with regard to employment effects of immigration. They also reveal some variation in people's attitudes towards immigration over time.

< Table 1 about here >

The numbers in Table 1 further indicate that more than 50% of the respondents believes that immigrants are good for the economy and another 30% neither agrees or disagrees with that statement. The expected positive effect of immigration on the economy as a whole is in line with the positive attitudes of Australians towards immigration flows observed in the international context. Lastly, Australians have a very negative view of immigrants in the context of crime. Only about 22-26% of the Australian population believes that immigrants do not increase crime rates, while about 45-50% is convinced that they do. In sum, the numbers indicate that Australians have a quite positive view of immigrants with regard to their effects on the economy and the labor market, while about half of the Australian-born population believes that immigrants increase crime rates.

Sample statistics of the combined samples of the AES and the regional level 1996 and 2001 Censuses are presented in Table 2. The samples include 1,079 individuals in 1996 and 1,220 individuals in 2001. Relevant individual-specific characteristics observed in the AES include age, gender, employment and marital status, levels of education, the income quintile of the household, and state indicators. Postcode level variables from Census data include the share of immigrants in the population, the population size,

the median weekly individual income, and educational and occupational distributions. We will use the variables presented in Table 2 as individual- and region-specific control variables when estimating the effect of the share of immigrants in the region on the respective attitude measures that were presented in Table 1.

< Table 2 about here >

2.2 Economic and Social Outcomes

The means and standard deviations of selected variables used in our empirical analysis of immigration effects are presented in Table 3. We consider three sub-samples that are used to estimate the effects of immigration on unemployment rates, median individual incomes, and crimes per 1,000 persons, respectively. The set of explanatory variables that are common in all sub-samples includes the regional share of immigrants, the median age, the population size, the regional distribution of education, and indicator variables for six major capital cities in Australia. We include the unemployment rate as an additional control variable in the income model and control for both unemployment rate and median income in the crime model.[6]

< Table 3 about here >

Table 3 reveals a decline in the unemployment rate from about 7% in 2001 to about 5% in 2006, which is consistent with official unemployment statistics (ABS, 2006c). However, the numbers in Table 3 are not representative for the Australian population because they are not weighted by the population size. As a result, the proportion of immigrants in the population is only around 17-18% in the unemployment and income samples and around 15-16% in the crime sample. The median age of the sample is around 36 years in 2001 and around 38 years in 2006. The median weekly individual income is close to $400 in 2001 and almost $500 in 2006. The number of crimes registered

[6]Our regression model further includes occupational shares, which are not presented in Table 3.

per 1,000 persons is about 1. The educational shares do not differ much across samples. About half of the population either has a vocational qualification or no post-secondary school degree. About 17% have a diploma, 25-26% have a bachelor degree (23-24% in the crime sample), while about 8-9% (7% in the crime sample) have a graduate or postgraduate degree.

We estimate immigration effects on unemployment and income at the SLA level, using balanced panels with 1,327 and 1,337 observations, respectively. The effect of immigration on crime levels is estimated for a balanced panel at the LGA level, including 462 of the 667 LGAs in Australia. We focus on the years 2001 and 2006 in our analysis of economic and social outcomes because we employ a lag variable of the 1996 and 2001 Censuses to construct an instrumental variable for 2001 and 2006, respectively. The following section provides a detailed description of our empirical strategy.

3 Empirical Strategy

To estimate the effects of immigration on individual attitudes, we employ a regression model of the following form:

$$A_{ijt} = \beta_0 + \beta_1 S_{jt} + X_{ijt}\beta_2 + Z_{jt}\beta_3 + \theta_j + \lambda_t + \varepsilon_{ijt}, \quad (1)$$

where A_{ijt} constitutes the attitude measure of individual i $(i = 1, ..., N)$ in postcode region j $(j = 1, ..., J)$ at time t $(t = 1996, 2001)$. S_{jt} denotes the regional share of the foreign-born population. X_{ijt} and Z_{jt} are the sets of individual- and region-specific characteristics (see Table 2). Specifically, X_{ijt} includes a quadratic function of the individual age, and indicator variables for employment, gender, marital status, the income quintile of the household, and the level of education. Z_{jt} contains the population size, the median weekly income, the unemployment rate, the median age, and educational and occupational shares. θ_j captures interregional differences that do not change over time and λ_t picks up changes over time that do not vary across regions. As a result,

β_1 captures changes in attitudes that are due to changes in the regional share of immigrants.[7] We may obtain an unbiased OLS estimate of the immigration effect β_1 if $E(\varepsilon_{ijt}|S_{jt}) = 0$.[8] However, since location choices of immigrants depend on economic and social conditions of the neighborhood, it seems likely that the share of immigrants in a region is correlated with unobserved determinants of the outcome variable. To account for the non-random sorting of immigrants across regions, we will use an instrumental variable (IV) strategy to obtain unbiased estimates of the immigration effects.

Our IV strategy is similar to the one employed by Cortes (2008). Specifically, we use the log of the counterfactual number of immigrants, i.e. the number of new immigrants that would enter the region in the current year if all new immigrants would settle according to the initial distribution of immigrants, as an instrument for the log of the actual share of immigrants. This instrument takes into account that immigrants can gain from using existing immigrant networks (i.e. a positive impact of segregation or regional clustering) by settling in specific locations (see Bartel, 1989; Munshi, 2003). Formally, our instrument is defined as:

$$IV_{jt} \quad = \quad \frac{I_{jt-1}}{I_{t-1}} \times (I_t - I_{t-1}),$$

where I_{jt-1} is the number of immigrants residing in region j at time $t-1$ $(1996, 2001)$, I_{t-1} is the total number of immigrants in Australia at time $t-1$, and I_t is the total number of immigrants in Australia at time t $(2001, 2006)$, respectively.

We obtain consistent estimates of the effect of immigration on individual attitudes if (i) our instrument is correlated with the share of immigrants in the region and if (ii) the only channel through which the instrument affects our outcome variable is its effect on the regional distribution of immigrants (exclusion restriction). It seems likely that the counterfactual number of immigrants is highly correlated with the actual share

[7] Our approach is comparable to Card and Krueger (1992) and Friedberg (2001).

[8] Our empirical analysis focuses exclusively on linear regression models. We have also used limited dependent variable models (such as binary and ordered logit models) to accommodate the non-linear nature of dependent variables but these models did not change our results qualitatively.

of immigrants. Figure 1 describes this relationship. Due to the regional variation in the population density, we weight the observed values with the number of people per square kilometer. The population density in each region is described by the size of the circle for each observation. We find a strong positive relationship between our excluded instrument and the share of immigrants.

< Figure 1 about here >

Since the construction of our instrument requires the use of a lag variable, we may only use cross-sectional data of individual attitudes in 2001 to estimate the IV model. Consequently, we are unable to employ an instrumental variable strategy and consider region fixed effects at the same time. However, we may compare our IV estimates to OLS estimates of the years 1996 and 2001 with and without region fixed effects to study the size and direction of the potential bias of our estimates. We further estimate alternative versions of equation (1) that include state fixed effects instead of region fixed effects to increase the explanatory power of our instrument by retaining some of the time-invariant regional variation in the model.

We estimate a similar model at a regional level to obtain the immigration effects on economic and social outcomes. In contrast to individual level attitudes data, the regional level data are also available in 2006, which allows us to estimate a regional level IV model with region fixed effects. As described earlier, we perform our analysis of immigration effects on unemployment and income at the SLA level and estimate our crime model at the LGA level. Specifically, we estimate the immigration effect on an outcome variable y_{kt} that is observed for each region k $(k = 1, ..., K)$ at time t $(t = 2001, 2006)$,

$$\log(y_{kt}) \quad = \quad \gamma_0 + \gamma_1 \log(S_{kt}) + Z_{kt}\gamma_2 + \delta_k + \phi_t + \nu_{kt}, \tag{2}$$

where k refers to the SLA in the unemployment and income models and to the LGA in the crime model. S_{kt} is the share of immigrants in region k at time t. The vector Z_{kt} of regional control variables includes the median age, the population size, and educational

and occupational distributions. The regional level model further includes region and time fixed effects (δ_k and ϕ_t). Similar to equation (1), we employ an IV strategy to account for non-random location choices of immigrants and we estimate alternative versions of equation (2) that include capital city fixed effects instead of region fixed effects.

4 Results

Table 4 summarizes the OLS and IV estimates of immigration effects on people's attitudes. We use the attitude measures of Table 1 as dependent variables. Detailed regression results of the respective models are presented in Appendix-Tables 1-3. Columns (1) and (2) of Table 4 contain the OLS estimates of model specifications with and without regional control variables. The model presented in Column (3) includes both regional control variables and region fixed effects. Columns (4) and (5) include the IV estimates of model specifications with and without regional control variables.

When comparing the OLS and IV estimates in Columns (1) and (4), we find that the IV estimates are slightly lower than the OLS estimates, suggesting that we overestimate immigration effects if we do not account for non-random location choices of immigrants. We also observe that the standard errors of the IV estimates are higher than those of the OLS estimates. However, when performing a simple t-test, we do not find significant differences between OLS and IV estimates.[9] Since our estimates are less significant when we include regional control variables in our models, we find that the differences between OLS and IV estimates in columns (2) and (5) are also insignificant.

Due to the use of a lag variable for the construction of our instrument, we only have cross-sectional data to estimate our IV models, which prevents an inclusion of region fixed effects. Fortunately, the differences between OLS and IV estimates are not

[9]We approximate the t-statistic to calculate the difference between the OLS estimate $\widehat{\beta}_{OLS}$ and the IV estimate $\widehat{\beta}_{IV}$ by $(\widehat{\beta}_{OLS} - \widehat{\beta}_{IV})/\sqrt{se(\widehat{\beta}_{OLS})^2 + se(\widehat{\beta}_{IV})^2}$, assuming that the covariance between the two coefficients is equal to zero.

significant, suggesting that our OLS estimates are not significantly biased. Consequently, we may consider the OLS estimates in column (3) as our preferred model because it controls for region fixed effects. The estimates in column (3) reveal that immigration effects on individual attitudes are insignificant.

< Table 4 about here >

The immigration effects on economic and social outcomes are summarized in Table 5. Appendix-Tables 4-6 include the detailed regression results of the respective models. Since the regional data comprise the years 1996, 2001, and 2006, we are able to construct our instrumental variable for the years 2001 and 2006 and to estimate an IV model with region fixed effects. The OLS estimates in columns (1) and (2) suggest that the regional share of immigrants is positively correlated with unemployment, income, and crime. However, the coefficients of the unemployment and crime regressions with region fixed effects in column (3) are not significant.

When comparing the OLS estimates in columns (1) and (2) to the IV estimates in columns (4) and (5) of Table 5, we find that the differences between OLS and IV estimates of the unemployment regression are insignificant, while the OLS estimates of the income and crime regressions differ significantly from the corresponding IV estimates. The IV estimate of the unemployment model in column (6) suggests that immigration does not affect regional unemployment. However, the first stage F-statistic below 10 indicates that the instrument of the unemployment regression with region fixed effects is weak. Since differences between OLS and IV estimates of the unemployment regression without region fixed effects are insignificant, we may consider the OLS model in column (3) as our preferred unemployment model.

< Table 5 about here >

The IV estimate of the income regression in column (6) also suffers from a weak instrument problem. In contrast to the unemployment regression, the OLS estimate with region fixed effects of the income regression may not be considered as unbiased

because the differences between OLS and IV estimates without region fixed effects are highly significant. As a result, the IV model in column (5), which does not remove time-invariant interregional differences entirely, is our preferred income model. The IV estimate in column (5) is not significant, suggesting that immigration does not affect regional incomes. Even though we may not observe the effect of an income model with a strong instrument and region fixed effects at the same time, we may conclude that there is no evidence for a negative effect of immigration on regional incomes.

Contrary to the expectations of many Australians, the estimate of the crime regression in column (6) reveals that immigration does not affect crime. Even after the inclusion of region fixed effects, our instrument is still sufficiently strong. On balance, the findings in Table 5 reveal that immigration has no adverse effects on regional unemployment rates, median incomes, or crime levels.

5 Conclusions

Australia's focus on skilled immigration in recent decades has been very successful and appears to be widely accepted in the population. Economic studies have shown that immigrants to Australia assimilate very quickly (Miller and Neo, 2003). We complement this evidence with an analysis of the relationship between people's attitudes towards immigrants and actual economic and social effects of immigration. We estimate instrumental variable models with region fixed effects to account for non-random location choices of immigrants and find that immigration has no adverse effects on regional unemployment rates, median incomes, or crime levels. We also find no effect of immigration on people's attitudes.

Our results are in line with the economic effects that people typically expect but do not confirm the public opinion about the contribution of immigration to higher crime levels, suggesting that Australians overestimate the effect of immigration on crime. The large share of immigrants who reside in regions with relatively high crime levels could be a possible explanation for this misperception. Our findings further suggest that both

an instrumental variable strategy and region fixed effects are needed to account for non-random sorting of immigrants into regions.

Tables and Figures

Table 1: Attitudes towards Immigrants

	Survey Year	
	1996 (%)	2001 (%)
Immigrants take jobs from Australians		
Strongly agree	12.79	10.66
Agree	26.69	22.79
Neither agree nor disagree	28.08	28.03
Disagree	24.56	29.59
Strongly disagree	7.88	8.93
Immigrants good for economy		
Strongly agree	7.32	7.54
Agree	43.65	48.20
Neither agree nor disagree	29.56	28.93
Disagree	15.20	11.64
Strongly disagree	4.26	3.69
Immigrants increase the crime rate		
Strongly agree	20.76	15.00
Agree	31.05	29.92
Neither agree nor disagree	25.86	28.85
Disagree	16.31	20.16
Strongly disagree	6.02	6.07
Observations	1,079	1,220

Source: Australian Election Study.

Table 2: Attitudes: Sample Statistics

	1996		2001	
	Mean	SD	Mean	SD
Australian Election Study				
Age	44.8	15.7	46.6	15.7
Employed	0.576	0.494	0.625	0.484
Female	0.519	0.500	0.521	0.500
Married	0.703	0.457	0.704	0.457
Below High School	0.265	0.442	0.197	0.398
High School Only	0.121	0.327	0.125	0.330
Diploma/Trade Qualification	0.364	0.481	0.432	0.496
University	0.249	0.433	0.230	0.421
HH Income Quintile 1	0.222	0.416	0.203	0.403
HH Income Quintile 2	0.226	0.419	0.191	0.393
HH Income Quintile 3	0.151	0.358	0.175	0.380
HH Income Quintile 4	0.192	0.394	0.230	0.421
HH Income Quintile 5	0.209	0.406	0.201	0.401
Australian Capital Territory (ACT)	0.017	0.128	0.016	0.127
New South Wales (NSW)	0.374	0.484	0.366	0.482
Northern Territory (NT)	0.001	0.030	0.001	0.029
Queensland (QLD)	0.163	0.370	0.165	0.371
South Australia (SA)	0.085	0.279	0.079	0.269
Tasmania (TAS)	0.019	0.135	0.022	0.147
Victoria (VIC)	0.251	0.434	0.262	0.440
Western Australia (WA)	0.090	0.286	0.089	0.285
Australian Census				
Immigrant Share	23.2	11.9	23.3	12.1
Population Size	22,031	13,731	22,594	13,930
Median Weekly Income	309	76	395	101
Unemployment Rate	9.4	3.5	7.5	2.8
Median Age	33.8	3.2	35.5	3.4
Certificate or Below	0.474	0.135	0.474	0.145
Diploma and Advanced Diploma	0.203	0.021	0.173	0.018
Bachelor	0.240	0.091	0.267	0.095
Graduate and Postgraduate	0.082	0.043	0.086	0.047
Manager	0.128	0.043	0.127	0.043
Professional	0.180	0.072	0.195	0.083
Technician and Trade	0.159	0.034	0.148	0.035
Community and Personal Service	0.079	0.013	0.085	0.015
Clerical and Administrator	0.168	0.029	0.163	0.028
Sales	0.102	0.015	0.107	0.017
Machine Operator and Driver	0.082	0.036	0.074	0.035
Laborer	0.102	0.036	0.101	0.041
Observations	1,079		1,220	

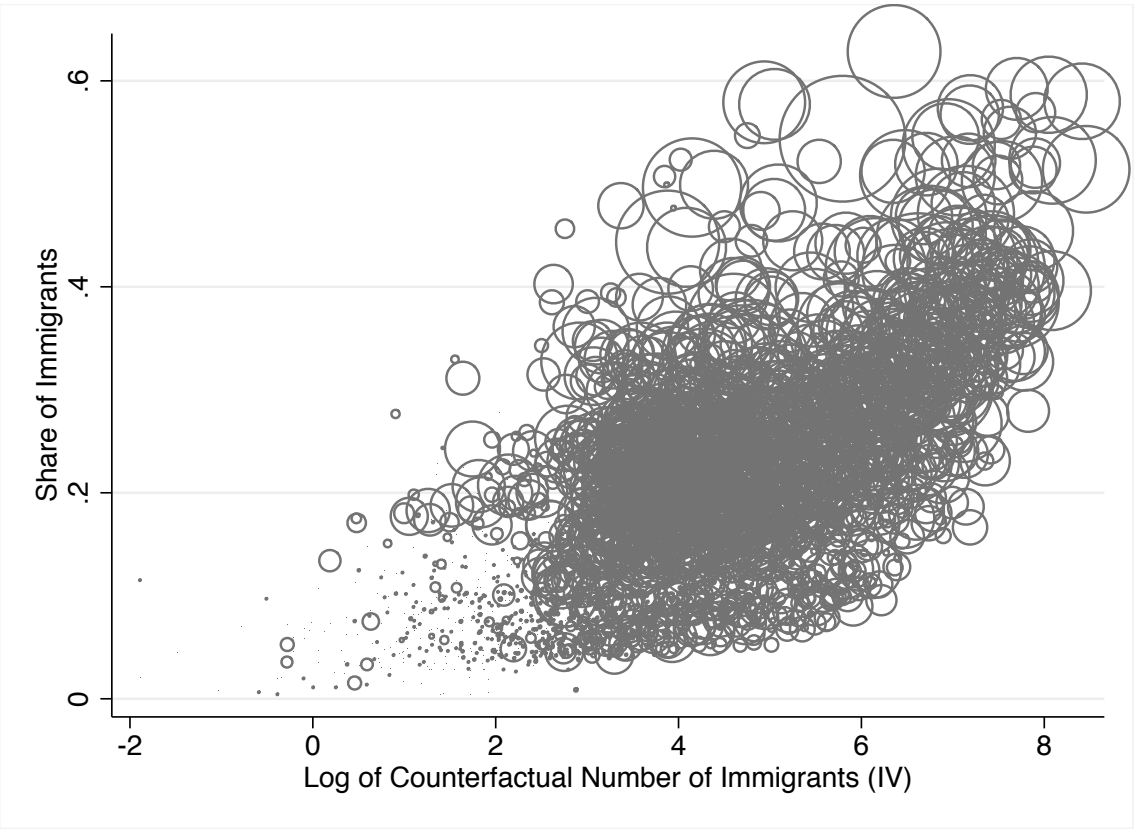
Source: Australian Election Study and Australian Census of Population and Housing.

Table 3: Economic and Social Outcomes: Sample Statistics

	2001		2006	
	Mean	SD	Mean	SD
Unemployment Sample				
Unemployment Rate	0.072	0.033	0.049	0.024
Immigrant Share	0.175	0.103	0.181	0.107
Median Age	35.7	4.3	37.7	4.8
Population Size	13,263	18,185	13,823	18,693
Certificate or Below	0.495	0.142	0.477	0.149
Diploma and Advanced Diploma	0.170	0.028	0.174	0.028
Bachelor	0.253	0.092	0.261	0.095
Graduate and Postgraduate	0.082	0.052	0.088	0.058
Observations	1,334		1,334	
Regional level	SLA		SLA	
Income Sample				
Median Weekly Income	393	121	500	164
Unemployment Rate	0.071	0.033	0.048	0.024
Immigrant Share	0.174	0.103	0.181	0.107
Median Age	35.7	4.3	37.7	4.8
Population Size	13,166	18,152	13,721	18,660
Certificate or Below	0.495	0.142	0.476	0.149
Diploma and Advanced Diploma	0.170	0.029	0.174	0.029
Bachelor	0.253	0.093	0.261	0.095
Graduate and Postgraduate	0.082	0.053	0.088	0.058
Observations	1,344		1,344	
Regional level	SLA		SLA	
Crime Sample				
Crimes/person	0.001	0.001	0.001	0.001
Median Weekly Income	366	100	460	141
Unemployment Rate	0.070	0.029	0.051	0.021
Immigrant Share	0.154	0.112	0.159	0.114
Median Age	36.4	3.5	38.7	4.1
Population Size	34,520	59,743	35,853	63,444
Certificate or Below	0.528	0.122	0.513	0.133
Diploma and Advanced Diploma	0.170	0.024	0.173	0.025
Bachelor	0.234	0.080	0.242	0.084
Graduate and Postgraduate	0.068	0.038	0.073	0.045
Observations	462		462	
Regional level	LGA		LGA	

Source: Australian Census and State Level Data on Offences.

FIGURE 1: Relationship between Share of Immigrants and IV



Note: Data taken from the unemployment sample; weighted by population density.

Table 4: Immigration Effects on Attitudes

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Jobs	0.012***	0.019***	0.057	0.009**	0.015
	(0.001)	(0.003)	(0.031)	(0.003)	(0.008)
F-Statistic (1^{st})				495.4	217.8
Shea-Partial R^2				0.423	0.306
Economy	-0.007***	-0.006*	0.016	-0.006*	-0.013*
	(0.001)	(0.002)	(0.026)	(0.002)	(0.006)
F-Statistic (1^{st})				495.4	217.8
Shea-Partial R^2				0.423	0.306
Crime	0.005**	0.003	-0.0001	0.002	0.002
	(0.001)	(0.003)	(0.033)	(0.003)	(0.007)
F-Statistic (1^{st})				495.4	217.8
Shea-Partial R^2				0.423	0.306
Socioeconomic characteristics	Yes	Yes	Yes	Yes	Yes
Regional control variables	No	Yes	Yes	No	Yes
Region fixed effects	No	No	Yes	No	No

Coefficients on immigrant share. Robust standard errors, which are reported in parentheses, are clustered at the postcode level. Observations: OLS sample: 2,299; IV sample: 1,493.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Immigration Effects on Economic and Social Outcomes

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Unemployment	0.120***	0.127***	-0.146	0.191***	0.232***	-0.400
	(0.026)	(0.029)	(0.095)	(0.055)	(0.067)	(0.345)
F 1^{st}-Stage				215.4	169.2	7.78
Shea-Partial R^2				0.215	0.174	0.029
Income	0.103***	0.127***	0.075**	0.010	0.033	0.435*
	(0.012)	(0.013)	(0.028)	(0.023)	(0.027)	(0.200)
F 1^{st}-Stage				202.4	158.5	6.32
Shea-Partial R^2				0.199	0.160	0.023
Crime	0.173*	0.258**	-0.178	-1.527***	-1.760***	0.090
	(0.080)	(0.084)	(0.133)	(0.230)	(0.258)	(0.602)
F 1^{st}-Stage				199.5	167.5	10.03
Shea-Partial R^2				0.366	0.298	0.055
Regional control variables	Yes	Yes	Yes	Yes	Yes	Yes
Capital city fixed effects	No	Yes	No	No	Yes	No
Region fixed effects	No	No	Yes	No	No	Yes

Coefficients on log of immigrant share. Robust standard errors, which are reported in parentheses, are clustered at the SLA (LGA for crime) level. Observations: Unemployment sample: 2,668; Income sample: 2,688; Crime sample: 924. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Appendix-Table 1: Attitudes towards Immigrants - Jobs

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Immigrant Share	0.0121***	0.0191***	0.0572	0.00951**	0.0151
	(0.00194)	(0.00350)	(0.0317)	(0.00358)	(0.00811)
Age	0.0320***	0.0313***	0.0293**	0.0326**	0.0333**
	(0.00901)	(0.00903)	(0.0111)	(0.0103)	(0.0103)
Age Squared	-0.000271**	-0.000270**	-0.000261*	-0.000240*	-0.000262*
	(0.0000906)	(0.0000903)	(0.000112)	(0.000103)	(0.000103)
Employed	0.00933	0.0149	0.0349	-0.00330	0.0152
	(0.0596)	(0.0595)	(0.0715)	(0.0696)	(0.0697)
Female	-0.0546	-0.0507	-0.0494	0.00956	0.0106
	(0.0473)	(0.0478)	(0.0557)	(0.0544)	(0.0541)
Married	-0.0941	-0.0857	-0.0523	-0.111	-0.0748
	(0.0557)	(0.0570)	(0.0696)	(0.0660)	(0.0657)
HH Income Quintile 2	0.187*	0.176*	0.211*	0.290**	0.270**
	(0.0766)	(0.0766)	(0.0952)	(0.0885)	(0.0899)
HH Income Quintile 3	0.266**	0.256**	0.266**	0.313***	0.259**
	(0.0812)	(0.0809)	(0.101)	(0.0938)	(0.0952)
HH Income Quintile 4	0.433***	0.423***	0.440***	0.530***	0.477***
	(0.0793)	(0.0804)	(0.0994)	(0.0950)	(0.0965)
HH Income Quintile 5	0.576***	0.551***	0.567***	0.638***	0.548***
	(0.0837)	(0.0858)	(0.102)	(0.0981)	(0.100)
Year 2001	0.125**	0.236*	-0.156		
	(0.0464)	(0.0983)	(0.393)		
High School Only	0.215**	0.181*	0.184	0.263**	0.223*
	(0.0818)	(0.0808)	(0.0982)	(0.0937)	(0.0930)
Diploma/Trade Qualification	0.184**	0.169**	0.180*	0.233**	0.222**
	(0.0603)	(0.0608)	(0.0704)	(0.0727)	(0.0721)
University	0.653***	0.615***	0.579***	0.826***	0.741***
	(0.0617)	(0.0627)	(0.0750)	(0.0803)	(0.0834)
Population Size (in 1,000)		-0.000338	-0.00558		-0.000195
		(0.00186)	(0.0206)		(0.00249)
Median Weekly Income (in $100)		0.00464	0.163		-0.0588
		(0.0660)	(0.270)		(0.0667)
Unemployment Rate		0.0206	0.0127		-0.00451
		(0.0140)	(0.0436)		(0.0213)
Median Age		-0.0176	-0.0950		-0.0226*
		(0.00982)	(0.0698)		(0.0112)
Diploma and Advanced Diploma		1.842	-8.705*		5.486*
		(1.535)	(4.298)		(2.490)
Bachelor		-1.193	-9.555		-0.0948
		(1.194)	(5.570)		(2.023)
Graduate and Postgraduate		-1.825	-7.225		0.371
		(2.570)	(10.58)		(2.875)
Constant	1.322***	2.661*		1.275***	2.138
	(0.216)	(1.090)		(0.266)	(1.420)

Robust standard errors, which are reported in parentheses, are clustered at the postcode level. Columns (2), (3) and (5) contain occupational shares; columns (2) and (5) contain state dummies. Observations: OLS sample: 2,299; IV sample: 1,493.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix-Table 2: Attitudes towards Immigrants - Economy

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Immigrant Share	-0.00753***	-0.00667*	0.0165	-0.00619*	-0.0134*
	(0.00170)	(0.00298)	(0.0268)	(0.00278)	(0.00603)
Age	-0.0425***	-0.0433***	-0.0454***	-0.0406***	-0.0425***
	(0.00757)	(0.00754)	(0.00886)	(0.00895)	(0.00892)
Age Squared	0.000344***	0.000354***	0.000366***	0.000297**	0.000320***
	(0.0000764)	(0.0000759)	(0.0000897)	(0.0000903)	(0.0000906)
Employed	-0.0183	-0.0183	-0.0352	0.0160	0.00179
	(0.0484)	(0.0478)	(0.0557)	(0.0568)	(0.0566)
Female	0.0655	0.0650	0.0811	0.0481	0.0455
	(0.0402)	(0.0402)	(0.0467)	(0.0468)	(0.0470)
Married	0.0807	0.0666	0.0338	0.0805	0.0539
	(0.0476)	(0.0475)	(0.0568)	(0.0551)	(0.0553)
HH Income Quintile 2	-0.0150	0.00264	-0.0112	-0.170*	-0.157*
	(0.0675)	(0.0673)	(0.0796)	(0.0776)	(0.0790)
HH Income Quintile 3	-0.0773	-0.0602	-0.0701	-0.121	-0.0855
	(0.0696)	(0.0695)	(0.0857)	(0.0797)	(0.0813)
HH Income Quintile 4	-0.147*	-0.131	-0.146	-0.295***	-0.253**
	(0.0706)	(0.0712)	(0.0844)	(0.0805)	(0.0823)
HH Income Quintile 5	-0.226**	-0.202**	-0.208*	-0.390***	-0.338***
	(0.0703)	(0.0728)	(0.0840)	(0.0817)	(0.0862)
Year 2001	-0.0737	-0.203*	-0.409		
	(0.0394)	(0.0787)	(0.301)		
High School Only	-0.126	-0.102	-0.136	-0.195*	-0.177*
	(0.0699)	(0.0706)	(0.0850)	(0.0799)	(0.0795)
Diploma/Trade Qualification	-0.0510	-0.0424	-0.0687	-0.105	-0.0959
	(0.0524)	(0.0523)	(0.0586)	(0.0633)	(0.0624)
University	-0.404***	-0.374***	-0.361***	-0.527***	-0.465***
	(0.0539)	(0.0553)	(0.0645)	(0.0704)	(0.0709)
Population Size (in 1,000)		-0.000663	0.00866		-0.00119
		(0.00164)	(0.0148)		(0.00179)
Median Weekly Income (in $100)		-0.00426	0.0602		0.0778
		(0.0605)	(0.210)		(0.0598)
Unemployment Rate		-0.0240*	-0.0182		0.0161
		(0.0121)	(0.0313)		(0.0172)
Median Age		0.00844	0.0273		0.0120
		(0.00909)	(0.0614)		(0.00974)
Diploma and Advanced Diploma		-1.547	1.344		0.101
		(1.283)	(3.465)		(2.022)
Bachelor		0.656	7.277		1.673
		(1.068)	(4.652)		(1.443)
Graduate and Postgraduate		1.769	1.107		2.428
		(2.226)	(8.575)		(2.498)
Constant	4.104***	4.125***		4.176***	3.348**
	(0.183)	(1.040)		(0.230)	(1.190)

See notes to Appendix-Table 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix-Table 3: Attitudes towards Immigrants - Crime

	OLS			IV	
	(1)	(2)	(3)	(4)	(5)
Immigrant Share	0.00575**	0.00365	-0.0000745	0.00273	0.00250
	(0.00186)	(0.00341)	(0.0332)	(0.00341)	(0.00782)
Age	0.0246**	0.0271***	0.0306**	0.0165	0.0208*
	(0.00813)	(0.00816)	(0.00962)	(0.00989)	(0.00991)
Age Squared	-0.000240**	-0.000264**	-0.000295**	-0.000134	-0.000177
	(0.0000815)	(0.0000815)	(0.0000962)	(0.000100)	(0.000100)
Employed	-0.0140	-0.0148	-0.0216	0.0171	0.0130
	(0.0535)	(0.0536)	(0.0634)	(0.0667)	(0.0663)
Female	0.0881	0.0816	0.0668	0.0487	0.0444
	(0.0472)	(0.0469)	(0.0542)	(0.0564)	(0.0560)
Married	-0.120*	-0.112*	-0.116	-0.103	-0.0989
	(0.0522)	(0.0518)	(0.0637)	(0.0663)	(0.0668)
HH Income Quintile 2	0.142*	0.134*	0.187*	0.241**	0.219*
	(0.0675)	(0.0673)	(0.0788)	(0.0853)	(0.0873)
HH Income Quintile 3	0.286***	0.268***	0.263**	0.303**	0.257**
	(0.0763)	(0.0772)	(0.0937)	(0.0927)	(0.0931)
HH Income Quintile 4	0.330***	0.322***	0.335***	0.456***	0.437***
	(0.0759)	(0.0761)	(0.0871)	(0.0966)	(0.0976)
HH Income Quintile 5	0.337***	0.334***	0.375***	0.426***	0.417***
	(0.0794)	(0.0805)	(0.0954)	(0.0970)	(0.0990)
Year 2001	0.149**	0.293**	-0.0104		
	(0.0466)	(0.0945)	(0.400)		
High School Only	0.396***	0.394***	0.415***	0.417***	0.438***
	(0.0857)	(0.0855)	(0.1000)	(0.0978)	(0.0970)
Diploma/Trade Qualification	0.222***	0.222***	0.237***	0.219**	0.234**
	(0.0583)	(0.0576)	(0.0656)	(0.0718)	(0.0714)
University	0.878***	0.840***	0.783***	0.950***	0.892***
	(0.0671)	(0.0696)	(0.0816)	(0.0832)	(0.0857)
Population Size (in 1,000)		-0.000138	0.0206		0.000874
		(0.00188)	(0.0170)		(0.00258)
Median Weekly Income (in $ 100)		-0.0640	0.0809		-0.121
		(0.0677)	(0.273)		(0.0735)
Unemployment Rate		0.0288*	0.0663		-0.000688
		(0.0141)	(0.0426)		(0.0202)
Median Age		-0.0182	0.0131		-0.0127
		(0.00962)	(0.0705)		(0.0116)
Diploma and Advanced Diploma		-0.740	-5.896		-0.848
		(1.480)	(4.066)		(2.416)
Bachelor		-0.0188	-5.896		0.452
		(1.225)	(5.544)		(1.990)
Graduate and Postgraduate		0.868	0.282		3.401
		(2.352)	(10.13)		(2.996)
Constant	1.355***	2.562*		1.598***	2.130
	(0.200)	(1.104)		(0.252)	(1.422)

See notes to Appendix-Table 1. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix-Table 4: Immigration Effects on Unemployment

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
log(Immigrant Share)	0.120***	0.127***	-0.146	0.191***	0.232***	-0.400
	(0.026)	(0.029)	(0.095)	(0.055)	(0.067)	(0.345)
Median Age	0.014***	0.014***	-0.007	0.013***	0.012***	-0.004
	(0.003)	(0.003)	(0.007)	(0.003)	(0.003)	(0.009)
Diploma Share	-2.993***	-3.015***	-0.621	-3.316***	-3.395***	-0.290
	(0.494)	(0.495)	(0.698)	(0.549)	(0.554)	(0.788)
Bachelor Share	-1.585***	-1.660***	-1.759**	-1.897***	-2.048***	-1.495*
	(0.367)	(0.376)	(0.610)	(0.406)	(0.419)	(0.715)
Graduate Share	-0.481	-0.519	-1.592	-0.728	-1.012	-1.293
	(0.510)	(0.547)	(0.985)	(0.527)	(0.609)	(1.041)
Population Size (in 1,000)	0.002***	0.003***	0.002	0.002**	0.003***	0.004
	(0.001)	(0.001)	(0.005)	(0.001)	(0.001)	(0.005)
Year 2006	-0.409***	-0.410***	-0.332***	-0.406***	-0.406***	-0.335***
	(0.012)	(0.012)	(0.027)	(0.013)	(0.013)	(0.027)
Constant	-3.086***	-3.022***	-2.310***	-2.614***	-2.377***	
	(0.314)	(0.323)	(0.684)	(0.471)	(0.521)	
Capital city fixed effects	No	Yes	No	No	Yes	No
Region fixed effects	No	No	Yes	No	No	Yes
Adjusted R^2	0.488	0.488	0.674	0.484	0.481	0.331
F 1^{st}-Stage				215.4	169.2	7.78
Shea-Partial R^2				0.215	0.174	0.029

Robust standard errors, which are reported in parentheses, are clustered at the SLA level. All regressions include occupational distributions. 2,668 observations. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix-Table 5: Immigration Effects on Income

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
log(Immigrant Share)	0.103***	0.127***	0.075**	0.010	0.033	0.435*
	(0.012)	(0.013)	(0.028)	(0.023)	(0.027)	(0.200)
Median Age	-0.009***	-0.010***	-0.009***	-0.008***	-0.008***	-0.014***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.004)
Diploma Share	-0.450*	-0.371	-0.340*	0.018	0.022	-0.755**
	(0.198)	(0.194)	(0.173)	(0.241)	(0.234)	(0.289)
Bachelor Share	-0.522***	-0.441**	0.122	-0.105	-0.083	-0.264
	(0.156)	(0.158)	(0.183)	(0.170)	(0.174)	(0.293)
Graduate Share	-0.515*	-0.886***	-0.284	-0.216	-0.482	-0.576
	(0.207)	(0.204)	(0.200)	(0.232)	(0.247)	(0.303)
Population Size (in 1,000)	-0.002***	-0.002***	-0.002	-0.001***	-0.002***	-0.004*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.002)
Unemployment Share	-4.332***	-4.335***	-1.421***	-4.025***	-4.049***	-1.126***
	(0.233)	(0.239)	(0.209)	(0.238)	(0.244)	(0.314)
Year 2006	0.146***	0.148***	0.217***	0.149***	0.151***	0.230***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.007)	(0.012)
Constant	2.198***	2.225***	1.576***	1.585***	1.647***	
	(0.116)	(0.116)	(0.192)	(0.167)	(0.179)	
Capital city fixed effects	No	Yes	No	No	Yes	No
Region fixed effects	No	No	Yes	No	No	Yes
Adjusted R^2	0.783	0.795	0.892	0.766	0.780	0.682
F 1^{st}-Stage				202.4	158.5	6.32
Shea-Partial R^2				0.199	0.160	0.023

See notes to Appendix-Table 4. 2,688 observations. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix-Table 6: Immigration Effects on Crime

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
log(Immigrant Share)	0.173*	0.258**	-0.178	-1.527***	-1.760***	0.090
	(0.080)	(0.084)	(0.133)	(0.230)	(0.258)	(0.602)
Median Age	-0.004	-0.003	0.057**	0.054**	0.068***	0.052*
	(0.012)	(0.012)	(0.017)	(0.019)	(0.020)	(0.021)
Diploma Share	-2.701	-2.267	-3.602*	9.488***	8.604**	-3.644*
	(1.728)	(1.621)	(1.595)	(2.649)	(2.786)	(1.581)
Bachelor Share	7.229***	7.703***	0.015	16.504***	17.001***	-0.369
	(1.284)	(1.233)	(1.313)	(2.107)	(2.109)	(1.504)
Graduate Share	-12.064***	-9.991***	-6.533***	-8.038**	-2.120	-6.571***
	(2.081)	(1.985)	(1.892)	(2.871)	(3.004)	(1.890)
Population Size (in 1,000)	-0.008**	-0.008***	-0.004	-0.007***	-0.007***	-0.004
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Unemployment Share	3.382*	4.783**	1.374	10.719***	13.091***	1.450
	(1.710)	(1.565)	(1.151)	(2.560)	(2.776)	(1.184)
Median Income	0.092	0.123**	0.046	0.205**	0.266***	0.036
	(0.048)	(0.045)	(0.044)	(0.064)	(0.068)	(0.049)
Year 2006	-0.418***	-0.392***	-0.402***	-0.461***	-0.481***	-0.386***
	(0.068)	(0.063)	(0.072)	(0.089)	(0.091)	(0.078)
Constant	-5.146***	-5.326***	-7.883***	-19.465***	-20.536***	
	(1.033)	(1.017)	(1.394)	(2.216)	(2.321)	
Capital city fixed effects	No	Yes	No	No	Yes	No
Region fixed effects	No	No	Yes	No	No	Yes
Adjusted R^2	0.746	0.775	0.522	0.514	0.509	0.015
F 1^{st}-Stage				199.5	167.5	10.03
Shea-Partial R^2				0.366	0.298	0.055

See notes to Appendix-Table 4. Robust standard errors are clustered at the LGA level. 924 observations.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$